P.R. GOVERNMENT COLLEGE (A), KAKINADA

(AN AUTONOMOUS COLLEGE WITH NAAC "A" GRADE)

Board of Studies Meeting for UG Programmes

ELECTRONICS

2022 – 2023

DEPARTMENT OF
PHYSICS & ELECTRONICS

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DEPARTMENT OF COLLEGIATE EDUCATION
GOVERNMENT OF ANDHRA PRADESH

PROCEEDINGS OF THE PRINCIPAL, PITHAPUR RAJAH's GOVT. COLLEGE[A]:: KAKINADA
Present: Dr. B.V. TIRUPANYAM, Ph.D.

Rc.No.12A/ A.C/BOS/2022-23 Dt.24 Sept'2022

Sub: P.R.G.C[A] – Academic Cell - **Conduct of BOS Meetings for the Academic Year 2022-23** – Guidelines issued - Regarding.

Ref: 1. Minutes of IQAC meeting dated 18 September 2022
2. Resolutions adopted in 22nd Staff Council Meeting held on 23 Sept 2022

PREAMBLE

The Autonomous colleges are, as per its vision, mission, stated objectives and core values, mandated to design and develop their own outcome -based curricula keeping in view the societal, local and global industry requirements, employability and industry – ready and transferable skills duly prescribing Course Outcomes (COs), Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) and suitable learning outcome assessment management system through robust and transparent evaluation system to measure their attainment levels of the students.

The Sustained Developmental Goals (SDG-4) of UNEP recommended assurance of quality to students in HEIs promoting creativity, critical thinking and collaborative skills, while building curiosity, courage, resilience and gender equality among students.

Further, the NEP-2020 recommended that the HEIs shall equip students with such skills that translate them into leaders and potential entrepreneurs too besides credit transfer mechanism through ABC (Academic Bank of Credits).

The HEIs are also, as per the Revised Accreditation Framework [RAF] of NAAC, endowed with the responsibility of rolling out quality and holistic human resources to the modern Indian Economy by ingraining quality in teaching- learning process by facilitating the students experience a wide range of participative and experiential learning strategies including field trips, conferences, integration of technology, community service programmes, career guidance, certificate and value added courses, research and inquisition based teaching, exchange programmes, gender equity programmes, etc.

Besides, the students shall have social consciousness, regard for constitutional provisions, right perspective on environmental protection, awareness on gender equity, health and hygiene, Yoga and wellness, college social responsibility, culture and values, etc., to mention a few.

Further, the Ministry of India, GoI, through NIRF, prescribes quality research, infrastructure augmentation, enhanced placement and progression to higher education, equipment of employability skills leading to enhanced public perception about the college among the public.

Our institution has, from AY 2022-23, has devised its new vision and mission along with objectives and core values necessitating design and re-orientation of its academic administration in tune with them.

ORDER:

In the light of the above mandate and responsibilities prescribed by institutions vision and mission, SDG-4, NEP – 2020, NAAC, NIRF to the autonomous HEIs, need to customize, design and re-orient their academic and research administration in tune with the policies of above bodies, our insitution is no exception.

Hence, the Chairmen of U.G and P.G Boards of Studies of various Departments are requested to make necessary arrangements for the conduct of the meetings separately between **11 October 2022 and 15 October 2022**. They are further requested to prepare curricula and extracurricular activities and devise suitable evaluation system keeping in mind above recommendations to make students a wholesome personality and a 21st century student capable of facing challenges, adaptive to changes, creative and innovative.

Further, the Chairman of the each BOS, in association with the IQAC coordinator, preceding the BOS meeting, is requested to prescribe benchmarking, quality initiatives in pedagogy and learning; in design of curriculum (with 20% change) and optimum utilization of existing human, physical and ICT resources and adopt resolutions to the extent of benchmarks (As per SOP given in **Annexure – I)**. Further, as the regular attendance of students to the classes is a deciding factor in enhancement of quality in learning, a minimum attendance of 60% for I mid-term examination, 75% for II mid-term examination under CIA component shall be the benchmark for attendance and it shall be approved in the BOS. The Chairmen are also requested to approve the new programmes to be introduced for 2022-23, if any, number of certificate courses, their frequency, Bloom's-Taxonomy based evaluation system for effective learning outcomes as per the Annexure - I

The Chairmen are, therefore, requested to

- Design curricula of Odd and even semesters for the A.Y 2022-23 both for U.G and P.G courses in tune with the stated vision, mission of the institution, RAF of NAAC, NEP-2020 and NIRF.
- Conduct meeting with employers, parents, alumni, shall take feedback on the existing curricula and invite suggestions and changes to be made.
- Invite the University nominee, subject experts, industrial nominees, student nominees, parents well in advance along with the date, venue, agenda, etc. A soft copy shall be communicated well in advance to the members to have an idea on the matters.
- Facilitate much room for intense deliberation on the design of the curricula, evaluation system, research component, enhancing learning experiences, resource utilization by staff ad students, etc.,
- Each Department shall approve and recommend additional credits for additional modules, training programmes, N.S.S, N.C.C, participation in cultural programs, sports and games, environmental programs, blood donations camps, etc.
- All meetings shall be offline. Online attendance of members faculty will be permitted only in exceptional cases.
- The Chairmen shall submit minutes of the meeting in the prescribed format only (Annexure – II) in triplicate(hard copies) to the Academic cell for onward submission to the IQAC, Examination cell and library within three days from the completion of BOS meeting and besides hosting the soft copy in the college website within the period stipulated.
- Each Chairman of BOS, shall get the rough draft of the curricula verified and approved by the Principal, Academic Cell and IQAC before the actual BOS meetings to ensure uniformity and commensurate with the stated vision and mission of the college among the departments.
- The Academic Cell coordinator shall be the Chief Coordinator for the BOS meeting activity and IQAC coordinator will be the additional coordinator.
- The Academic Coordinator and IQAC coordinator shall conduct a meeting with the Chairmen, BOS between 28-29 September 2022 and explain the structure of curricula, uniformity other modalities.
- The Controller of Examinations of the institution shall fund the BOS meetings from the available funds on the condition of reimbursement after receiving autonomous funds from UGC. Initially, he shall pay Rs. 5,000/- uniformly as an advance per Board to the respective Chairman (If BOS meetings for multiple Boards are to be held under one Chairmanship, he/ she shall be given advance amount equivalent to the number of Boards x Rs.5000/-.
- The Chairman of each BOS shall apply to the Principal for advance amount for meeting the BOS meetings with head-wise expenditure in the prescribed format (Annexure-III).

Following contents shall be presented in the BOS document in order

1. Proceedings of the Principal pertaining to BOS
2. Composition of BOS

3. Vision and Mission of the college
4. Agenda: It shall include ATR on the previous BOS meeting first, resolutions, etc., later.
5. Table showing the Allocation of Credits in the following table for both theory and Lab in case of sciencesubjects

S. No	Semester	Title of the Course (Paper)	Hrs./week	Max. Marks (SEE)	Marks in CIA	Credits
1	III	Optics	4	50	50	4

6. Resolutions adopted in the meeting with detailed discussion that took place during the meeting (Activities and Benchmarking as per Annexure –I)
7. At the end of each theory paper, each topic shall be mapped as per the Blooms taxonomy and scope of that topic for skill/ employability/ entrepreneurship opportunities in the following table incorporated

S. No	Subject	Semester	Title of the Course (Paper)	Topic	Parameter as per Blooms taxonomy (Knowledge/ Application/ Creativity/ Innovation	Experiential learning component	Scope (Skill/ employability/ entreprenuership)
1	III	Botany	Plant Physiology	Plant Cell	Knowledge	Shall be shown Microscope	
2	III	History	Tourism	Tourism management	Application	Apprenticeship	Employability

8. Each BOS Chairman shall, immediately after syllabus, tabulate the changes made in the syllabus/ paper along with justification, in the Proforma given in Annexure – I.
9. Attendance of Members present with signatures in the tabular form.
10. List of Examiners & Paper setters
11. Syllabus for each course (both theory & Practical in case of Science subjects) followed by model questionpapers (theory & practical) and allocation of CIA (50 marks) for each course with structure.
12. CO-PO mapping /PO attainment data
13. Text & Reference Books
14. e-content links

PRINCIPAL
Pithapur Rajah's **Government Autonomous College**
Kakinada

Enclosures: Annexures- I, II & IIICopy to:
Lecturers-in-Charge (BOS Chairmen) of all the departments
IQAC coordinator
Controller of Examinations
Office

OFFICE OF THE DEAN, ACADEMIC AFFAIRS

ADIKAVI NANNAYA UNIVERSITY

RAJAMAHENDRAVARAM

No. ANUR/DAA/PR Govt. College (A)/Sub. Experts/2021 Date: 22-10-2021

PROCEEDINGS OF THE VICE-CHANCELLOR

Sub:- ANUR- DAA – Nominated University Subject Experts for BOS – PR Govt. College (A), Kakinada – Orders - Issued.

Ref:- 1. Lr. dated 15.09.2021, from the Principal, PR Govt. College (A), Kakinada
2.Proc. No: ANUR/PRG College (A), KKD/UG BoS/2019/09, dated 19.03.2019

Read:-Note for Orders of the Vice-Chancellor dated 21.10.2021

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ORDERS

Having consider the request cited in the ref. 1, the Vice-Chancellor is pleased to order that the following members be nominated as University Subject Experts for UG Board of Studies of ***PR Govt. College (A), Kakinada*** for a period of three years from the date of the proceedings issued.

S.No.	UG Courses	Name of the Subject Expert
1	English	Dr. Prasanthi Sree, AKNU MNS Campus, Kkd, Ph No: 9848297555, sathupathi.sri@gmail.com
2	Hindi	Dr. N Venkata Ramana, SKBR College, Amalapuram, Ph. No: 9849373773
3	Telugu	Dr. P. Nagaraju, GDC, Palakollu, Ph.No: 9052038569, raju00517@gmail.com
4	Sanskrit	Dr. TGY Acharyulu, SKR Womens College, Rajahmundry, Ph. No: 9848628812
5	Mathematics	Dr. V. Anantha Lakshmi, Principal, GDC Pithapuram, Ph. No : 9963786386, ananthamaths@rediffmail.com
6	Statistics & Actuarial Sciences	Dr. D V Ramana Murthy, HoD of Statistics, SKVT College, Rajamahendravaram, Ph.No: 9949135864, drdvrmurthy@gmail.com
7	Chemistry & Analytical Chemistry	Dr. K. Jhansi Lakshmi, Principal, Ideal College of Arts & Sciences, KKD, Ph.No: 9441236409, jhansikalisindi@gmail.com
8	Physics & Electronics	Dr. Paul Diwakar, Sri CRR College (A), Eluru, 9985050696
9	Petro Chemicals	Dr. M Trinadh, Lecturer in Chemistry, Govt. College (A), Rajahmundry, Ph. No: 8639551783
10	Bio-Chemistry	Dr. M Suvarchala, Lecturer in home science, ASD women's Degree College, KKD, Ph. No: 9346512694, suvarchakamallela@gmail.com
11	Food Science	
12	Botany	Dr. J. Sujatha, Leturer in Botany, GDC Rjy, Ph.No: 9441050910, drjsuneetha@gcrjy.ac.in
13	Microbiology	Dr. D Aruna, Lecturer in Micro-biology, ASD Women's College, Kakinada, Ph. No: 9182525872
14	Zoology	Dr. B. Tejo Murthy, Lecturer in Zoology, GDC Yeleswaram, Ph. No: 9703799970, drmtm2011@gmail.com
15	Bio Technology	Dr. B. Nageswari, Lecturer in Biotechnology, GDC Rjy, Ph. No: 986621955

16	Commercial Aquaculture	Dr. P Ramamohana Rao, Aquaculture Consultant, KKD, Ph. No: 9885144557, asreenivasulu@gmail.com
17	Computer Science & Computer Applications	Mr. N. Naga Subrahmanyesweri, Lecturer in Computer Science, ASD Women's College, KKD, Ph. No: 9948438376, yesweri.velugu@asddgcw.ac.in
18	Commerce	Dr. K. Ratna Manikyam, Govt. College (A), RJY, Ph. No: 8919230362, drkrm@gcrjy.ac.in
19	Economics	Dr. D. V. Nageshwara Rao, Lecturer, GDC, RJY, Ph. No: 9490919676
20	History	Dr. B. Anjani Kumari, Lecturer in charge, GDC (W), Ph. No: 891989337
21	Philosophy	Dr. V. Venkatarao, Lecturer in Philosophy, MR College, Vijayanagaram, Ph. No: 9440096609
22	Political Science	Dr. Seetha Mahalaxmi, Lecturer in Political Science, GDC, RJY Ph. No: 9491011844
23	Journalism & Mass Communication	Prof. DVR Murthy, Dept. of Journalism & Mass Communication, Andhra University, Vishakapatnam, Ph. No: 9985051793, 9440974092
24	Horticulture	Dr. J. Sujatha, Lecturer in Botany, GDC, Rjy, Ph. No: 9441050910, drjsuneetha@gcrjy.ac.in
25	Pharmaceutical Chemistry	Dr. K. Deepthi, Asst. Professor, Dept. of Chemistry, AKNU, Rjy, Ph. No: 9985469607, deepthikorabandi@gmail.com

(BY ORDERS)

Dean 22/10/21
ACADEMIC AFFAIRS

To
The Principal, PR Govt. College (A), Kkd
PA to R
PS to VC,
OOF

PROCEEDINGS OF THE PRINCIPAL, P.R. GOVERNMENT COLLEGE(A), KAKINADA-A.P.

Present: Dr. B.V. Tirupanyam, M.Sc; Ph.D.

R.C. No.12A/A.C./BOS/2022-23, Dated: 24.09.2022

SUB: P.R.Government College (A), Kakinada - UG Boards of Studies (BoS)- Program/ Course - **B.Sc./ Electronics** Nomination of Members – Orders issued

REF: 1. UGC Guidelines of for Autonomous Colleges-2018.

ORDER:

The Principal, P.R.Government College (A), Kakinada is pleased to constitute UG Boards of Studies in Electronics for framing the syllabi in Electronics subject for all semesters duly following the norms of the UGC Autonomous guidelines.

S.No.	Name of the Nominee	Designation
1	Sri U.V.B.B. Krishna Prasad; Head of the Department	Chairman
2	Dr. P. Paul Diwakar	University nominee, Y.V.N.R. Government College, Kaikaluru.
3	Sri D. Gangadharudu	Subject Expert, Lec.in Electronics, MR Government College, PDP
4	Sri K. VenkateswaraRao	Local Nominee,Subject Expert, Lec.in charge/ Phy/A.S.D. Degree College (W), KKD.
5	Sri B. Sudarshan	Representative from Industry, Andhra Electronics, Kakinada., Kakinada.
6	Dr. K. Nanda Gopal	Sr. Scientific Asst., Indian Meteorology Department., Alumni
7	Smt. M. Surekha	Member
8	Dr. K.Jayadev	Member
9	Ms. G. Sridevi	Member
10	Sri R. Tejeswara Rao	Member
11	Dr.SVGVA Prasad	Member
12	P. Himakar	Member
13	Sri B.Srikanth	Member
14	K. Durga Rao	Member
15	N. Bhagya Lakshmi	Student Member II MPE
16	D. Geetha Rani	Student Member II MECs
17	P. Veerababu	Student Member I MECs
18	P. Vijay	Student Member I MEIoT

The above members are requested to attend the BOS meeting on -10-2022 and share their valuable views, and suggestions on the following functionaries.

- Prepare syllabi for the subject keeping in view the objectives of the college, interest of the stake holders and National requirement for consideration and approval of the IQAC and Academic Council
- Suggest methodologies for innovative teaching and evaluation techniques
- Suggest the panel of names to the Academic Council for appointment of Examiners
- Coordinate research, teaching, extension and other activities in the Department of the College.

PRINCIPAL
P.R. Government College (A), Kakinada

PRINCIPAL
P.R. Govt. Colleg
KAKINADA

Vision & Mission of the College

VISION: To contribute its might for holistic and quality human capital formation for modern economy with focus on developing employment opportunity – enhancing skilling ecosystem, through integration of research, value system and technology into teaching – learning process.

MISSION:

- To provide conducive and outcome-based skill development environment in the institution to brighten prospects for progression to higher education, employment opportunities in Government and Private agencies, for personal growth and enhanced productivity and economic growth.
- To collaborate with coaching centers or skill development institutions for skill development.
- To develop systems for quality enhancement in learning by student through promotion of ICT integration into learning, deployment of learning resources at the door steps of students for optimum utilization.
- Designing and implementing student-centric, inquisitive, practical-rich and research based curricula, including project works, problem-solving & applications oriented TLPs, field trips, etc., that facilitate experiential and participative learning.
- To strengthen research and development and create new research knowledge through intense research, collaborations, knowledge and technology transfer.
- To foster innovation among students through trainings and forging collaborations with outside organizations
- To turn each student into a wholesome personality through initiatives in Community Service, Gender equity initiatives, Environment protection, personality development, transferable skills, understanding constitution and its spirit and their role in nation building.
- To mould the character of each constitutional provisions-abiding and inquisition-arousing

P.R. GOVT.COLLEGE (A), KAKINADA

DEPARTMENT OF PHYSICS & ELECTRONICS

Board of Studies – Electronics

Meeting held on: Dt. 31 – 10 – 2022 (Monday) **Time: 2.00 PM**

At: Department of Physics & Electronics staff room

Agenda of the Meeting

To discuss and approve:

1. Action taken report (ATR) of the A.Y.2021-22
2. Revised-common program structure and semester wise curriculum.
3. Adoption of regulations on scheme of examination and marks/grading system.
4. Engaging of 7th hour of time table
5. Streamlining of regularity in attendance.
6. Value added courses viz. add on courses and skill development courses to be conducted by
   the department during the academic year 2022-23.
7. Collaboration with industry and third party sector organisation in view of industrial internship.
8. Make students access to ICT infrastructure for enhanced quality in higher education.
9. Remedial coaching for slow learners and project/ research work for advanced learners
10. Allocation of extra credits for extracurricular activities.
11. List of equipment/software requirement for each lab/practical of **Semester-V**.
12. Conduct of parent teacher meeting.
13. Panel of Question papersetters and Examiners
14. Action plan for the academic year 2022-23.
15. Departmental budget proposal for the academic year 2022-23
16. Any other with the permission of the chair.

P.R. Government College (Autonomous), Kakinada
Department of Physics and Electronics
BOARD OF STUDIES - PHYSICS
Resolutions of the Meeting

The Board of Studies meeting was convened by the Physics & Electronics Department on 31-10-20222 at 2.00 pm under the chairmanship of U.V.B.B. Krishna Prasad, In-charge of the department, Dr. P. Paul Divakar, University Nominee, Sri. D. Gangadharudu, Subject expert, all members of the faculty of Physics & Electronics and student representatives attended the meeting. The following agenda items are discussed and resolutions are made

Agenda-1: Action taken report (ATR) of the A.Y.2021-22
Proposal: Presented before the BOS members to discuss on the above agenda 1.
Discussion: Discussed the action taken report (ATR) of the A.Y.2021-22
Resolution Adopted: Appreciated and approved as all the activities were successfully completed in the proposed time line.

Agenda-2: Revised-common program structure and semester wise curriculum.
Proposal: Placed before the BOS members to discuss on the above agenda 2.
Discussion: Discussed the entire program structure
Resolution Adopted: Resolved to adopt the revised common program structure and verified course wise syllabi as per guidelines issued by APSCHE and ANUR. Also discussed and approved the revised course wise structure, Syllabi, Blue print and model papers of **Semesters I – V** for the academic year 2022-23.

Agenda-3: Adoption of regulations on scheme of examination and marks/grading system.
Proposal: It is put before the BOS members to discuss on the above agenda 3.
Discussion: Discussed the Continuous Internal Assessment (CIA): Examination pattern.
Resolution Adopted: Approved the Mode of internal assessment, pattern of examination of internal assessment and scheme of evaluation of practical exams .
of Semesters I-IV as external 50Marks and internal assessment 50Marks. For all LSCs and SDCs has no internal assessment. All the practical classes of Semesters I-V will be conducted for 2 Hrs.
It is resolved to approve the split up of Continuous Comprehensive Evaluation CCE – 50 Marks for **Semesters I-IV** as follows:

Examination	Mode of Assessment	Marks allotted
(CIA) Continuous Internal Assessment SEM I-IV	Student study Project	10
	Viva Voce	10
	Seminar and Group Discussion	5
	Average of 2 Mid examinations conducted @25marks	25
TOTAL MARKS		**50**

- It is resolved to conduct 2 mid examinations @ 25 marks of each for **Semesters I-IV** and the student should attend at least one internal exam.
- Resolved to continue the scheme of examination, pattern of examination of **Sem-V** as external 60Marks and internal assessment 40Marks.
- It is resolved to continue the split up of Continuous Comprehensive Evaluation CCE – 40 Marks for **Sem-V** as

Examination	Mode of Assessment	Marks allotted
(CIA) Continuous Internal Assessment Sem-V	ICT based Seminar	10
	Assignment	5
	Quiz	5
	Average of 2 Mid examinations conducted @40marks	20
	TOTAL MARKS	**40**

- It is resolved to conduct one pre-final examination for I, II & III year students.
- Discussed and approved the scheme of evaluation of practical examinations for all the I – V semesters.
- It is resolved to approve the conduct of semester end practical exams only with internal examiners for odd semester and with both internal and external examiners for even semesters at the end of each semester.
- Resolved and approved the blue print, model papers of semester end examinations for all the I – V semesters.

Agenda-4: Engaging of 7th hour of time table
Proposal: It is Presented before the BOS members for discussion on this agenda point
Discussion: Discussed the engagement of 7th hr introduced by the authorities
Resolution Adopted: It is resolved to dedicate the 7th hour classes for extra-curricular activities and student counseling by class mentors.

Agenda-5: Streamlining of regularity in attendance.
Proposal: It is put before the BOS members to discuss the above agenda point 5.
Discussion: Discussed the measures to be taken for improving the regularity of the students

Resolution Adopted: Resolved to make the **75% of attendance is mandatory** to appear for both the internals **1st and 2nd mid-term examinations** and also it is resolved that the student should attend at least one internal exam to appear for the Semester end examination.

Agenda-6: Certificate courses viz. add on courses and skill development courses to be conducted by the department during the academic year 2022-23.

Proposal: It is placed before the BoS members to discuss on the above agenda 6.

Discussion: Discussed the LSCs and SDCs to be included.

Resolutions Adopted:

- Resolved to start a value added certificate course **"Household Electrical Wiring"** for **Sem I** along with the APSCHE and Affiliated University, ANUR prescribed SDC, "Electrical Appliances**",** @30 hrs. for 2 credits having 5units@ 2 theory hrs. per week and one Study Project at the end of the course, designed by the Department.
- Resolved to adopt Community Service Project for all the students at the end of **Sem –II**.
- Resolved to organize the add on certificate course "**Applications of Solar Cells in Home Energy Systems"** in **Sem III** with a duration of 30 hrs. for 2 credits having 4units@ 2 theory hrs. per week and one Study Project at the end of the course.

Agenda-7: Collaboration with industry and third party sector organisation in view of industrial internship.

Proposal: It is placed before the BoS members to discuss on the above agenda 7.

Discussion: Discussed on collaboration with industry and third party sector organisation in view of industrial internship.

Resolutions Adopted:

- Resolved to send all the final year Physics and Electronics students for on job training apprenticeship in connection with industries for off-site Project in the end of **Sem V/VI with the following industries** in accordance with their interest of study.

S . No.	NAME OF THE INDUSTRY	LOCATION	NATURE OF SKILLS AIMED TO BE
1	ISIE India Pvt. Ltd., Noida	Kakinada	Electronic vehicle technology
2	JVS Technologies	Kakinada	Electronic devices manufacturing and repairs
3	Solar Systems	Kakinada	Installation of Solar panels
4	Ramakrishna Rewinding Works	Kakinada	Rewinding of Electrical appliances

Agenda-8: Make students access to ICT infrastructure for enhanced quality in higher education.

Proposal: It is placed before the BoS members to discuss on the above agenda 8.

Discussion: Discussed on making the students access to ICT infrastructure for enhanced quality in higher education.

Resolutions Adopted: By identifying various modules and topics for ICT platform and to develop e-content in 4- quadrants method to the students and upload in the college website.

Agenda-9: Remedial coaching for slow learners and project/ research work for advanced learners

Proposal: It is placed before the BoS members to discuss on the above agenda 9.

Discussion: Discussed on remedial coaching for slow learners and project/ research work for advanced learners.

Resolutions Adopted: Resolved to adopt a bench mark from previous appeared examinations to divide the students into three categories

- Resolved to take '**O'** as benchmark for advanced learners to assign critical assignments, project/research works and ICT based class seminars
- Resolved to take '**B'** as benchmark for moderate learners to assign assignments and class seminars
- Resolved to take '**F'** as benchmark for slow learners to conduct remedial coaching

Agenda-10: Allocation of extra credits for extracurricular activities.

Proposal: It is presented before the BOS members to discuss on the above agenda10.

Discussion: Discussed the allocation of extra credits for extracurricular activities.

Resolution Adopted: Approved to give extra credits for MOOCS courses, N.S.S., N.C.C., winners of zonal level sports and games competitions, participation in state level/ National level competitions, blood donations camps, environmental programs like extending services in facing the natural calamities etc. as mentioned in the following table.

Sl. No.	Activity	Details of achievement	Credits
1	**MOOC Course**	SWAYAM /NPTEL /CEC etc., (Course Completion certificate with credits should be produced for the claim of extra credits)	Total credits achieved will be considered
2	**NCC**	B CERTIFICATE	2
		Participation in National Camp after 'B' certificate	3
		C certificate	4

		Adventure camp/RD parade along with 'B'	5
		Failed in B certificate Examination	1
3	**Sports**	Intercollegiate selection	2
		South zone selection	3
		All India participation	4
		Winning medals in all India competitions	5
4	**NSS**	40% attendance in regular NSS activities	1
		50% attendance with Community Service	2
		Conduct of survey/Youth exchange/RD	3
5	**JKC**	Enrollment and training	1
		Campus recruitment local level	2
		MNCs/reputed companies	3
6	**Community service**	Participation in community service by departments (outreach programmes)	2
7	**Cultural activity**	Winning medals at state level-2, District level-1	2 1
8	**COP/Add on Course**	Pass in Certificate Exam-1, Diploma-2	1 2
9	**Support services**	Lead India, Health club, RRC and Eco Club etc., participation in various programmes	1

Agenda-11: List of equipment/software requirement for each lab/practical of **Semester-V**.
Proposal: Placed before the BOS members to discuss on this agenda point 11.
Discussion: Discussed the requirement for each lab/practical of **Semester-V**.
Resolution Adopted: Approved and resolved to purchase the needy equipment, which are suggested after discussion.

Agenda-12: Conduct of parent teacher meeting.
Proposal: It is presented before the BOS members for the discussion on this agenda point 12
Discussion: Discussed the conduct of parent teacher meeting
Resolution Adopted: Approved and resolved to conduct parent teacher meeting twice in the academic year at each semester and to make them aware of their role as stakeholders in the college administration.

Agenda-13: Panel of examiners to be approved in BOS.

Proposal: It is presented before the BOS members to discuss on the above agenda 13.
Discussion: Discussed the panel of Question paper setters and examiners.
Resolution Adopted: Approved and resolved.

Agenda-14: Action plan for the academic year 2022-23.
Proposal: It is put before the BOS members to discuss on the above agenda 14.
Discussion: Discussed the action plan to implement the departmental activities more effectively as per the plan.
Resolution Adopted: It is resolved to approve Department Action Plan for the Academic Year 2022-23.

Agenda-15: Departmental budget proposal for the academic year 2022-23
Proposal: It is presented before the BOS members to discuss on the above agenda 15.
Discussion: Discussed the budget proposal
Resolution Adopted: Approved the budget proposal for the academic year 2022-23.

P. R. Government College (Autonomous), Kakinada

DEPARTMENT OF PHYSICS

Board of Studies Meeting 2022-23

Action Taken Report

The Department of Physics conducted the BOS meeting for the academic year 2021-22 on 12.11.2021 in the Department of Physics. All the activities according to the plan of action were successfully completed in the proposed time line. By taking the valuable recommendations of the members for enhancement of knowledge and to enrich the skills of the students, the department took initiatives and implemented various innovative steps viz.

- International conference was organized on 7.1.2022 on "New Forays Of Luminescent Advanced Materials & Phosphors in Multi-Disciplinary Technologies" (Lamp – 2022)
- A guest lecture was conducted by scientists of BARC on "Nuclear Energy and its Applications, Career opportunities in BARC" on 17.302022
- A field visit was conducted to Command & Communication Centre, Smart City, Kakinada on 13th July 2022.
- Many electronic kits which were not in working condition were replaced by bread boards and electronic components.
- Started an add on certificate course "Applications of Solar Cells in Home Energy Systems" in Sem IV @30 hrs. for 2 credits having 5units@ 2 theory hrs. per week and one Study Project at the end of the course.
- Started a skill enhancement certificate course "Soldering and Desoldering of Components" in Sem IV @30 hrs. for 2 credits having 5units@ 2 theory hrs. per week and one Study Project at the end of the course
- Started "Centre for Innovation and Incubation Centre" for innovative projects on the platform of ' Atal Tinkering Labs'
- Installation of "Solar Tree" in before the Physics Block is in process

BOS CERTIFICATION

P. R. GOVERNMENT COLLEGE (A), KAKINADA
Department of Physics & Electronics

This is to certify that the proposed agenda of board of studies meeting held in Department of Physics & Electronics on -10-2022, for the Academic Year 2022-23 have been discussed and approved by the board members unanimously. The valuable suggestions have been adopted for effective implementation of Curricular/Co-curricular and Research activities for the academic year 2022-23.

- Syllabi regarding all semesters of B.Sc program.
- Following the scheme of evaluation for CIA&SEE for all the semesters I-V of I,II &III B.Sc. Programs.
- Following the allocation of Credits for all the semesters of B.Sc. programme
- Offering one "Community Service Project" as a credit course to I year students, one skill enhancement course as a credit course for II year and internship for III year before completion of the course during summer vacation in either V or VI semester.
- Certificate courses offered by the Department of Physics& Electronics
- List of Examiners
- Departmental action plan for the academic year 2022-23.
- Budget proposal for the academic year 2022-23.

Members of Board of Studies			Signatures of members
1	Sri U.V.B.B. Krishna Prasad, In-charge dept. of Electronics	Chair person	
2	Dr. P. Paul Diwakar, Lecturer in Physics, YVNR Govt. College, Kaikaluru	University nominee	
3	Sri D. Gangadharudu, Lr. in Electronics, MR college, Peddapuram	Subject Expert	
4	Sri K. Venkateswara Rao, Lec.in charge/Phy, ASD college (W)(A), Kakinada	Local Nominee	

5	Sri B. Sudarshan, Andhra Electronics, Kakinada.	Representative from Industry	
6	Dr. K. Nanda Gopal, Sr. Scientific assistant, IMD	Student Alumni	
7	Smt. M. Surekha	Member	
8	Dr. K. Jaya Dev	Member	
9	Kum G. Sridevi	Member	
10	Smt. A. Padmavathi	Member	
11	Dr. S.V.G.V.A. Prasad	Member	
12	Sri P. Himakar	Member	
13	Sri B. Srikanth	Member	
14	Sri K. Durga Rao	Member	
15	N. Bhagya Lakshmi	Student II MPE	
16	D. Geetha Rani	Student II MECs	
17	P. Veerababu	Student I MECs	
18	P. Vijay	Student I MEIot	

P.R. Government College (Autonomous), Kakinada

Department of Physics and Electronics

UG Program (4 years Honors) Structure (CBCS)

2020-21 A.Y., onwards

BACHLOR OF SCIENCE

(3rd. and 4th year detailed design will be followed as per APSCHE GUIDELINES)

Subjects/ Semesters		I		II		III		IV		V		VI			
		H/W	C	H/W	C	H/W	C	H/W	C	H/W	C	H/W	C		
Languages												THIRD PHASE of APPRENTICESHIP Entire 5th / 6th Semester		FIRST and SECOND PHASES (2 spells) of APPRENTICESHIP between 1st and 2nd year and between 2nd and 3rd year (two summer vacations)	
English		4	3	4	3	4	3								
Language (H/T/S)		4	3	4	3	4	3								
Life Skill Courses		2	2	2	2	2+2	2+2								
Skill Development Courses		2	2	2+2	2+2	2	2								
Core Papers															
M-1	C1 to C5	4+2	4+1	4+2	4+1	4+2	4+1	4+2 4+2	4+1 4+1						
M-2	C1 to C5	4+2	4+1	4+2	4+1	4+2	4+1	4+2 4+2	4+1 4+1						
M-3	C1 to C5	4+2	4+1	4+2	4+1	4+2	4+1	4+2 4+2	4+1 4+1						
M-1	SEC (C6,C7)									4+2 4+2	4+1 4+1				
M-2	SEC (C6,C7)									4+2 4+2	4+1 4+1				
M-3	SEC (C6,C7)									4+2 4+2	4+1 4+1				
Hrs/ W (Academic Credits)		30	25	32	27	32	27	36	30	36	30	0	12	4	4
Project Work															
Extension Activities (Non Academic Credits)															
NCC/NSS/Sports/Extra-Curricular									**2**						
Yoga							**1**		**1**						
Extra Credits															
Hrs/W (Total Credits)		30	25	32	27	32	28	36	33	36	30	0	12	4	4

M= Major; C= Core; SEC: Skill Enhancement Courses

P.R. Government College (Autonomous), Kakinada

Marks & Credits distribution: UG-Sciences

Sl. No	Course type	No. of courses	Each course teaching Hrs/wk.	Credit for each course	Total credits	Each course evaluation			Total marks
						Conti-Assess	Univ-exam	Total	
1	English	3	4	3	9	50	50	100	300
2	S. Lang	3	4	3	9	50	50	100	300
3	LS	4	2	2	8	0	50	50	200
4	SD	4	2	2	8	0	50	50	200
5	Core/SE -I	5+2	4+2	4+1	35	50	50+50	150	1050
	Core/SE -II	5+2	4+2	4+1	35	50	50+50	150	1050
	Core/SE -III	5+2	4+2	4+1	35	50	50+50	150	1050
6	Summer-Intern	2		4	8		100	200	200
7	Internship/ Apprentice/ on the job training	1		12	12		200	200	200
		38			**159**				**4550**
8	**Extension Activities (Non Academic Credits)**								
	NCC/NSS/Sports/ Extra-Curricular			**2**	**2**				
	Yoga	**2**		**1**	**2**				
	Extra Credits								
	Total	**40**			**163**				

DETAILS OF COURSE TITLES & CREDITS (AY 2022 - 23)

Sem	Course no.	Course Name	Course type (T/L/P)	Hrs./ Wk. (Science: 4+2)	Credits (Science : 4+1)	Max. Marks Cont./Internal/ Mid Assessment	Max. Marks Sem-end Exam
I	1	Circuit theory and electronic devices	T	4	4	50M	50M
	1 P	Practical course -1	L	2	1	0	50M
II	2	Digital Electronics	T	4	4	50M	50M
	2 P	Practical Course - 2	L	2	1	0	50M
III	3	**Analog circuits and communication**	T	4	4	50M	50M
	3 P	Practical Course - 3	L	2	1	0	50M
IV	4	Microprocessor systems	T	4	4	50M	50M
	4 P	Practical Course - 4	L	2	1	0	50M
	5	Microcontroller & Interface	T	4	4	50M	50M
	5 P	Practical Course -5	L	2	1	0	50M
V	6A	Industrial Electronics	T	4	4	40M	60M
		Industrial Electronics Lab	L	2	1	0	50M
	7A	Electronic Instrumentation	T	4	4	40M	60M
		Electronic Instrumentation Lab	L	2	1	0	50M
	OR						
	6B	Embedded systems design	T	4	4	40M	60M
		Embedded systems design Lab	L	2	1	0	50M
	7B	Consumer Electronics	T	4	4	40M	60M
		Consumer Electronics Lab	L	2	1	0	50M
	OR						
	6C	VLSI Design	T	4	4	40M	60M
		VLSI Design Lab	L	2	1	0	50M
	7C	Data communication and Networking	T	4	4	40M	60M
		Data communication and Networking Lab	L	2	1	0	50M

Note: *Course type code: T: Theory, L: Lab

Note 1: For Semester–V, for the domain subject **ELECTRONICS**, any one of the three pairs of Skill Enhancement Courses shall be chosen as courses 6 and 7, i.e., 6A & 7A or 6B & 7B or 6C & 7C. The pair shall not be broken (ABC allotment is random, not on any priority basis).

Note 2: One of the main objectives of Skill Enhancement Courses (SEC) is to inculcate field skills related to the domain subject in students. The syllabus of SEC will be partially skill oriented. Hence, teachers shall also impart practical training to students on the field skills embedded in the syllabus citing related real field situations.

Note 3: To insert assessment methodology for Internship / on the Job Training / Apprenticeship under the revised CBCS as per APSCHE Guidelines.

- **First internship (After 1st Year Examinations):** Community Service Project. To inculcate social responsibility and compassionate commitment among the students, the summer vacation in the intervening 1st and 2nd years of study shall be for Community Service Project (the detailed guidelines are enclosed).
- **Credit For Course: 04 for 100 marks**

Examples of community service project offered by the department

- Consumption of solar energy in industrial sector
- Survey of electricity consumption on primary needs
- Effect of social media on society
- Impact of online payments in daily life
- Urge of Internet for education purpose
- Utilization of solar energy in public sector
- Effect of social media on society
- Recommendations for energy saving houses
- Utilization of solar energy in Kakinada Smart city
- Energy saving techniques in houses
- Usage of Internet for carrier development
- Usage of Internet for digital payments
- Household survey in electricity consumption.
- Survey of quality on internet service provider

- **Second Internship (After 2nd Year Examinations):** Apprenticeship / Internship / on the job training / In-house Project / Off-site Project. To make the

students employable, this shall be undertaken by the students in the intervening summer vacation between the 2nd and 3rd years (the detailed guidelines are enclosed).

- **Credit For Course: 04 for 100 marks**

- **Third internship/Project work (6th Semester Period):**

  During the entire 6th Semester, the student shall undergo Apprenticeship / Internship / On the Job Training. This is to ensure that the students develop hands on technical skills which will be of great help in facing the world of work (the detailed guidelines are enclosed).

- **Credit For Course:12 for 200 marks**

P.R. Government College (Autonomous), Kakinada

Department of Physics& Electronics

Proposed Skill Enhancement Courses from the Department of Physics & Electronics :

- For **Sem I,** along with the APSCHE and Affiliated University, ANUR prescribed Skill Development Course, **"**Electrical Appliances**",** one Add on certificate course **"Household Electrical Wiring" "** @30 hrs. for 2 credits having 5units@ 2 theory hrs. per week and one Study Project at the end of the course was designed by the Department.

- For **Sem II,** the APSCHE and Affiliated University, ANUR prescribed Skill Development Course, " Solar Energy" was adopted by the Department.

- For **Sem III**, one Add on certificate course "**Soldering and De-soldering "** with 30 hrs. duration for 2 credits having 4units@ 2 theory hrs. per week and one Study Project at the end of the course was designed by the Department.

- For **Sem IV**, in accordance with the prescribed on job training apprenticeship, all the Physics and Electronics students are supposed to connect with the following industries for off-site Project.

S. No.	NAME OF THE INDUSTRY	LOCATION	NATURE OF SKILLS AIMED TO BE
1	ISIE INDIA PVT. LTD., Noida	Kakinada	Electronic vehicle technology
2	JVS Technologies	Kakinada	Electronic devices manufacturing and repairs
3	Solar Systems	Kakinada	Installation of Solar panels
4	Ramakrishna Rewinding Works	Kakinada	Rewinding of Electrical appliances

- List of Suitable levels of positions eligible in the Govt /Pvt organizations

Suitable levels of positions for these graduates either in industry/govt organization like., technical assistants/ scientists/ school teachers., clearly define them, with reliable justification

S. No	Position	Company/ Govt. organization	Remarks	Additional skills required, if any
1	Clerk	IBPS		Skill in functional English, and aptitude.
2	SSC	Central Govt.		Skill in functional English, and aptitude with GK.
3	Asst. Programmer	MNC (Software Companies)		Skill in functional English, and aptitude and expected domain skills
4	Technical Assistant	Pharma Companies	Chemistry background student	Along with aptitude and English, domain skills.

P.R. Government College (A), Kakinada

Blue print for the model paper – Electronics

Semester End External examination

For I & II year core courses

2022 – 2023

S. No.	Type of question	Given in the Question paper			To be answered		
		No. of Questions	Marks allotted To each question	Total marks	No. of Questions	Marks allotted To each question	Total marks
1	Section – A Essay question	6	10	60	3	10	30
2	Section – B Short answer Question	7	5	35	4	5	20
TOTAL				**95**			**50**

Percentage of Choice given $= \frac{95-50}{95} \; x \; 100$

$= \frac{45}{95} \; x \; 100 \qquad = 47.4\ \%$

Semester End External examination

For III year core courses 2022 – 2023

S. No.	Type of question	Given in the Question paper			To be answered		
		No. of Questions	Marks allotted To each question	Total marks	No. of Questions	Marks allotted To each question	Total marks
1	Section – A Essay question	6	10	60	3	10	30
2	Section – B Short answer Question	12	5	60	6	5	30
TOTAL				**120**			**60**

Percentage of Choice given $= \frac{120-60}{120} \; x \; 100$

$= \frac{60}{120} \; x \; 100 \qquad = 50\ \%$

P.R. Government College (A), Kakinada

Blue Print for Internal Theory Examination

For I & II Year (Sem I & Sem III) Papers

S. No.	Type of question	No. of Questions Given			No. of Questions to be answered		
		No. of Questions	Marks allotted To each question	Total marks	No. of Questions	Marks allotted To each question	Total marks
1	**Section – A** Essay question	2	10	20	1	10	10
2	**Section – B** Short answer questions	5	5	25	3	5	15
TOTAL				**45**			**25**

Percentage of Choice given = $\frac{45-25}{45}$ X 100 = 44.44 %

The total of two internals is reduced to 25 marks and the other 25 marks allocated for CCE are further divided as follows

Study project = 10 marks

(Theoretical for odd Sem / Practical for even Sem)

Viva on subject/ Assignment = 10 marks

Seminar/ GD/ Quiz/ Field trip = 5 marks

Total **= 25 marks**

P.R. Government College (A), Kakinada

Blue Print for Internal Theory Examination

For III year (Sem V) Papers

S. No.	Type of question	No. of Questions Given			No. of Questions to be answered		
		No. of Questions	Marks allotted To each question	Total marks	No. of Questions	Marks allotted To each question	Total marks
1	**Section – A** Essay question	3	10	30	2	10	20
2	**Section – B** Short answer questions	8	5	40	4	5	20
TOTAL				**70**			**40**

Percentage of Choice given $= \frac{70-40}{70} X\ 100 = 42.9\ \%$

The total of two internals is reduced to 20 marks and the other 20 marks allocated for CCE are further divided as follows

Seminar / Viva-voce	= 5 marks
Group discussion / Quiz	= 5 marks
Assignment	= 10 marks
Total	**= 20 marks**

Blue print for Semester End Practical examination
For I, II & III Year

Practical Paper

Scheme of Valuation for Practical

Time: 2 hrs. Max. Marks: 50

1. Formulae & Explanation - 10 Marks
2. Tabular form + graph + circuit diagram - 10 Marks
3. Observations - 10 Marks
4. Calculation, graph, precaution and results - 10 Marks
5. Viva voice - 05 Marks
6. Record - 05 Marks

Note: Minimum of 6 experiments to be done and recorded.

For Microprocessor /Micro Controller practical

Scheme of Valuation for practical

Time:2 hrs. Max.Marks:50

1. Flow chart - 08 M
2. Algorithm - 07 M
3. Program - 15 M
4. Execution and Result - 10 M
5. Viva voice - 05 M
6. Record - 05 M

P.R.GOVT. COLLEGE (A), KAKINADA

Department of Physics and Electronics

B.Sc. - Programme Outcomes

On successful completion of B.Sc. programme students will be able to:

PO 1 Domain Expertise:

- Acquire comprehensive domain knowledge and skills.
- Make use of the knowledge in an innovative manner.

PO 2 Life-long Learning and Research:

- Learn "how to learn"- Self-motivated and self-learning.
- Adopt to the ever emerging demands of work place and life.
- Investigate the problem and report in a proper manner.

PO 3 Modern Equipment Usage

- Adopt ICT mode of learning effectively.
- Access, retrieve and use authenticated information.
- Have knowledge of software applications to analyze data
- Usage of technology without deviating from the dedication of learning.

PO 4 Computing Skills and Ethics

- Develop rational and scientific thinking .
- Ensure the human values & ethics and to follow them throughout the life.

PO 5 Complex problem Investigation & Solving

- Predict and analyze problems.
- Frame hypotheses.

- Investigate and interpret empirical data.
- Plan and execute action.

PO 6 Perform effectively as Individuals and in Teams

- Work efficiently as an individual
- Cooperate, coordinate and perform effectively in diverse teams/groups.

PO 7 Efficient Communication & Life Skills

- To face challenges and self-sustainability in overcoming the psychological problems.
- Listen, understand and express views in a convincing manner.
- Develop skills to present information clearly and concisely to interested groups.

PO 8 Environmental Sustainability

- Following the green energy measures.
- Understand sensibly the environmental challenges.
- Think critically on preventing of environmental pollution.
- Propagate and follow environment friendly practices.

PO 9 Societal contribution

- Involve voluntarily in social development activities at Regional, National levels.
- Voluntary participation in serving the society from natural calamities viz. disasters, cyclones, epidemics.
- Be a patriotic citizen to uphold the constitutional values of the Nation.

PO 10 Effective Project Management

- Adoption of changes time to time in accordance with the situations.
- Identify the goals, objectives and components of a project for its completion.
- Plan, organize and direct the endeavors of teams to achieve the targets in time.
- Be competent in identifying opportunities and develop strategies and decision making for contingencies.

PSO of the Courses offered during 2022-23

COURSE: B.Sc. - Mathematics, Physics, Electronics (M.P.E)

- **PSO 1:** Domain knowledge and understand the mechanism behind various electronic and physical systems and qualitative way through experiential learning with firm mathematical tools.
- **PSO 2:** Analyze the physical properties materials, electronic components to develop essential tools for better livelihood.
- **PSO 3:** Skills to study the optical, thermal, electrical and electronic properties of materials and also to explore the properties of various electronic components, communication systems, microprocessor and micro-controller.
- **PSO 4:** Ability to interlink the skills developed to select proper materials for suitable electronic applications, and acquires an aptitude to address the problems in simulation of electronic circuits, developing web and mobile applications.

COURSE: B.Sc. - Mathematics, Electronics, Computer Science (M.E.CS)

- **PSO 1:** Domain knowledge and understand the concepts of basic electronic components, microprocessors and micro controllers, algorithms, C language, Arduino programming, Networking, cloud and Big Data.
- **PSO 2:** Analyze the concepts of mathematics, Electronics and computer Networks and able to use them in solving real world problems
- **PSO 3:** Acquire the skills to use various electronic components, implementation of numerical algorithms by using various experiential techniques.
- **PSO 4:** Ability to interlink and adopt the skills developed and acquires an aptitude to address the problems in simulation of electronic circuits, developing web and mobile apps.

COURSE: B.Sc. - Mathematics, Electronics, Internet of Things (M.E.Iot)

- **PSO 1:** Domain knowledge and understand the concepts of basic electronic components, networks, communication systems, microprocessors and micro controllers, algorithms, C language, Arduino programming, Networking, cloud and Big Data.
- **PSO 2:** Analyse the concepts of mathematics, Electronics and computer Networks and able to use them in solving real world problems.
- **PSO 3:** Acquire the skills to use various electronic components, microprocessor, microcontroller, Arduino, Raspberry PI and simulators.
- **PSO 4:** Ability to interlink the skills developed to design tools for internet of things, and gets an aptitude to address the problems in smart home design, smart vehicles, and smart sensors in various fields.

P . R . GOVT. COLLEGE (A), KAKINADA

DEPARTMENT OF PHYSICS & ELECTRONICS

BOS OF ELECTRONICS

ADDITIONS & DELETIONS IN THE CURRICULAM

Program : I B.Sc.
Semester : I
Course : I Electronics
Title of the course : Circuit theory & Electronic devices.

S. No.	Name of the Module	Topics Added	Justification
1	Module I	Kirchhoff's laws Voltage divider rule Current divider rule	➢ In continuation with the previous topic. ➢ It is appropriate to include this topic in view of further studies and competitive exams.
2	Module V	Applications of LED & Photodiode	➢ For Practical application

Total Percentage of addition: 15 %

Program : I B.Sc.
Semester : II
Course : II Electronics
Title of the course : Digital Electronics.

S. No.	Name of the Module	Topics Added	Justification
1	Module II	4 variable K-map & Don't care condition.	➢ In continuation with the previous topic. ➢ It is appropriate to include this topic in view of further studies and competitive exams.
2	Module IV	Serial in parallel out. Parallel in serial out.	➢ It is appropriate to include this topic in view of further studies and competitive exams.
3	Module V	Applications of memory devices.	➢ In continuation with the previous topic.

Total Percentage of addition: 20 %

Program : II B.Sc.
Semester : III
Course : III Electronics
Title of the course : Analog circuits & Communication.

S. No.	Name of the Module	Topics Added	Justification
1	Module II	Monostable multivibrator. Astable multivibrator.	➢ It is appropriate to include this topic in view of further studies and competitive exams.
2	Module III	Equation of AM. Bandwidth of AM.	➢ It is appropriate to include this topic in view of further studies and competitive exams. ➢ For better understanding of the subject.

Total Percentage of addition: 20 %

Program : II B.Sc.
Semester : IV
Course : IV Electronics
Title of the course : Microprocessor systems.

S. No.	Name of the Module	Topics Added	Justification
1	Module I	Flag register Interrupts: maskable, non-maskable, vectored & non-vectored	➢ In continuation with the previous topic. ➢ It is appropriate to include this topic in view of further studies and competitive exams.
2	Module IV	Register organization. Flag register	➢ Clear understanding about 8086 microprocessors. ➢ It is appropriate to include this topic in view of further studies and competitive exams.

Total Percentage of addition: 20 %

Program : II B.Sc.
Semester : IV
Course : V Electronics
Title of the course : Microcontroller & Interfacing.

S. No.	Name of the Module	Topics Added	Justification
1	Module I	Harvard & Von Neumann architecture. Differences between RISC & CISC microcontrollers	➢ Gives idea about various architectures. ➢ Gives idea about technology that is used in various microcontrollers.
2	Module II	Features of 8051	➢ Gives overview of 8051.
3	Module V	Basics of serial communication.	➢ Gives idea about different types of communication.

Total Percentage of addition: 20 %

NOTE: **NONE OF THE TOPICS ARE DELETED.**

	P. R. College (Autonomous), Kakinada	**Program & Semester** I B.Sc. Electronics (I Semester) W.e.f. 2022-23 Admitted batch			
Course Code **EL1205**	**TITLE OF THE COURSE** **Circuit Theory & Electronic Devices**				
Teaching	Hours Allocated: 60 (**Theory**)	L	T	P	C
Pre-requisites	Ohm's Law, A.C & D.C currents, Semiconductor Physics	4	-	-	4

Course Objectives:

1. To explain the basic concepts and laws of DC and AC electrical networks and solve them using mesh and nodal analysis techniques.
2. To analyze circuits in time and frequency domain.
3. To synthesize the networks using passive elements.
4. To understand the construction, working and VI characteristics of electronic devices.
5. To understand the concept of power supply.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Apply concepts of electric network topology, nodes, branches, loops to solve circuit problems including the use of computer simulation.
CO2	Apply time and frequency concepts of analysis.
CO3	Synthesize the network using passive elements.
CO4	Design and construction of a power supply

Course with focus on employability / entrepreneurship / Skill Development modules

Skill Development		**Employability**		**Entrepreneurship**	

Syllabus

MODULE- 1: (12Hrs)

SINUSOIDAL ALTERNATING WAVEFORMS:

Definition of current and voltage. ***Voltage divider rule, Current divider rule, Kirchhoff's laws***. The sine wave, general format of sine wave for voltage or current, phase relations, average value, effective (R.M.S) values. Differences between A.C and D.C. Phase relation of R, L and C.

MODULE-II: (12hrs)

PASSIVE NETWORKS AND NETWORKS THEOREMS (D.C):

Branch current method, Nodal Analysis, Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power, Milliman and Reciprocity theorems.

MODULE-III: (12hrs)

RC, RL AND RLC CIRCUITS:

Frequency response of RC and RL circuits, their action as low pass and high pass filters. Passive differentiating and integrating circuits. Series resonance and parallel resonance circuits, Q – Factor.

MODULE-IV: (12hrs)

BJT, FET and UJT:

BJT: Construction, working, and characteristics of CE Configurations. FET: Construction, working and characteristics of JFET. Advantages of FET over BJT. UJT: Construction, working and characteristics of UJT. UJT as a Relaxation oscillator.

MODULE-V: (12hrs)

POWER SUPPLIES & PHOTO ELECTRIC DEVICES:

Rectifiers: Half wave, full wave rectifiers-Efficiency-ripple factor- Filters- L- section & π-section filters. Three terminal fixed voltage I.C. regulators (78XX &79XX). Light Emitting Diode and Photo diode. ***Applications of LED & Photo diode***

TEXT BOOKS:

1. Introductory circuit Analysis (UBS Publications) ---- Robert L. Boylestad.
2. Electronic Devices and Circuit Theory --- Robert L. Boylestad & Louisashelsky.
3. Circuit Analysis by P. Gnanasivam- Pearson Education
4. Electronic Devices and Circuit Theory-- Robert L. Boylestad& Louis Nashelsky.
5. Electronic Devices and Circuits I – T.L.Floyd- PHI Fifth Edition

REFERENCE BOOKS:

1. Engineering Circuit Analysis By: Hayt & Kemmerly - MG.
2. Networks and Systems – D.Roy Chowdary.
3. Unified Electronics (Circuit Analysis and Electronic Devices) by Agarwal- Arora
4. Electric Circuit Analysis- S.R. Paranjothi- New Age International.
5. Integrated Electronics – Millmam&Halkias.
6. Electronic Devices & Circuits – Bogart.
7. Sedha R.S., A Text Book Of Applied Electronics, S.Chand& Company Ltd

Web Links:

1. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjYtPvh7YL7AhU6TGwGHaKKAHoQFnoECD4QAQ&url=https%3A%2F%2Felectrical-engineering-portal.com%2Fdownload-center%2Fbooks-and-guides%2Felectrical-engineering%2Fnetwork-theorems&usg=AOvVaw2HI0x1Qo43GIqR7RdsQmdr
2. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjE2tDf7oL7AhXYRmwGHdF2DaoQFnoECEEQAQ&url=https%3A%2F%2Fwww.vedantu.com%2Fphysics%2Fcharacteristics-of-a-transistor&usg=AOvVaw3NrlCetDk7VIFzMS2Vy1-b
3. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjnrvWF74L7AhWuUGwGHbpYD1IQFnoECBAQAw&url=https%3A%2F%2Fwww.efxkits.co.uk%2Ffet-field-effect-transistor-circuit-characteristics%2F&usg=AOvVaw1eCNgmerQxk3FMt9prh7jF

Activities Proposed:

Measurable:

1. Assignments on Branch analysis & Nodal analysis, Network theorems, Frequency response for RLC circuits, NPN transistor characteristic curves, FET characteristics, UJT characteristics, Applications of UJT, Rectifiers, Filters, LEDs & Photo diodes
2. Student seminars (Individual presentation of papers) on topics relating to Branch analysis & Nodal analysis, Network theorems, Frequency response for RLC circuits, NPN transistor characteristic curves, FET characteristics, UJT characteristics, Applications of UJT, Rectifiers, Filters, LEDs & Photo diodes
3. Quiz Programmes on Alternating wave forms, RC, RL & RLC circuits, BJT, FET, UJT & Power supplies.
4. Individual Field Studies/projects on designing a circuit by using network theorems, Q-factor of an ac circuit, Transistor as an amplifier, IC voltage regulator using 78XX & any related project by using LED.
5. Group discussion on AC & DC, Applications of transistors, Applications of FET, rectifiers and its uses, Filters and its types, Voltages regulators and its types
6. Group/Team Projects on Design of IC voltage regulator by using solar power

General:

1. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
2. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
3. Any similar activities with imaginative thinking.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	3	3	3	1	-	-	1	3	3	1	3
CO2	3	2	3	3	2	3	3	1	-	2	2	3	2	3
CO3	3	2	3	2	2	2	2	1	1	3	3	2	2	2
CO4	3	2	2	2	2	2	3	1	-	1	3	3	2	3
Avg.														

Topics Included / Deleted under Autonomous setup

Program : I B.Sc.
Semester : I
Course : I Electronics
Title of the course : Circuit theory & Electronic devices.

S. No.	Name of the Module	Topics Added	Justification
1	Module I	Kirchhoff's laws Voltage divider rule Current divider rule	➢ In continuation with the previous topic. ➢ It is appropriate to include this topic in view of further studies and competitive exams.
2	Module V	Applications of LED & Photodiode	➢ For Practical application

Total Percentage of addition: 15 %

P.R.GOVERNMENT COLLEGE (A), KAKINADA
Electronics-Semester –1
Paper – 1 [Code: EL1205]
w.e.f. 2022 - 23 ADMITTED BATCH
Circuit Theory & Electronic Devices

4 Hours/Week [Total: 60 hrs.] **Credits: 04**

MODEL QUESTION PAPER

Note: - Set the question paper as per the blue print given.

Time: 2 Hrs. **Max.Marks:50**

Section	Questions to be given	Questions to be answered	Marks
A	6	3	3 x 10M = 30M
B	7	4	4 x 5 M = 20M
Total	13	7	50M

Blue Print

Module Name	Essay Questions [10 marks]	Short Questions [5 marks]	Problems [5 marks]	Marks allotted
Sinusoidal alternating waveforms	1	1	-	15
Passive networks & Network theorems	1	1	1	20
RC, RL & RLC Circuits	1	1	1	20
BJT, FET and UJT	2	1	-	25
Power supplies & Photo electric devices rectifiers	1	1	-	15
Total Marks				95

Note: At least two problems should be answered.

P.R.GOVERNMENT COLLEGE (A), KAKINADA
Electronics - Semester – 1
Paper – 1 [Code: EL1205]
w.e.f. 2022 - 23 ADMITTED BATCH
Circuit Theory & Electronic Devices

4 Hours/Week [Total: 60 hrs.] **Credits: 04**

MODEL QUESTION PAPER

Time: 2 hrs. **Max Marks: 50M**

Section - A

Answer any Three questions by choosing at least one question from each part

3 X 10 = 30 M

Part - A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 3

Part - B

4. Essay question from Module – 4
5. Essay question from Module – 4
6. Essay question from Module – 5

Section - B

Answer any Four questions **4 X 5 = 20 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 2
9. Short answer question from Module - 3
10. Short answer question from Module - 4
11. Short answer question from Module - 5
12. Problem from Module – 2
13. Problem from Module – 3

Circuit Theory & Electronic Devices
QUESTION BANK

MODULE-I: SINUSOIDAL ALTERNATING WAVEFORMS

ESSAY QUESTIONS

1. Explain the following terms for an A.C. Signal (a) Average value (b) RMS value.
2. Define phasor? Explain phasor notation. Describe how phasors are used to represent sinusoidal waveforms.
3. State and prove Kirchhoff's laws.

SHORT ANSWER QUESTIONS

3. Distinguish between A.C. and D.C.
4. Evaluate voltage divider rule.
5. Evaluate current divider rule.
6. Describe A.C. circuit containing pure Resistance only.
7. Describe A.C. circuit containing pure Capacitance only.
8. Describe A.C. circuit containing pure Inductance only.

MODULE-II: PASSIVE NETWORKS

ESSAY QUESTIONS

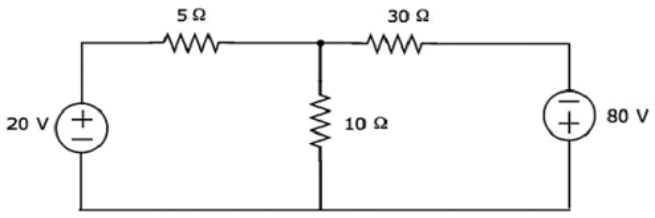
8. State and prove Superposition theorem.
9. State and prove Norton's theorem.
10. State and prove Thevenin's theorem.

SHORT ANSWER QUESTIONS

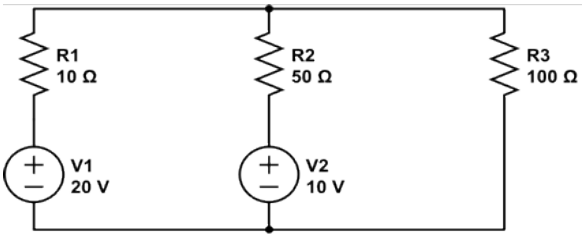
11. Explain Loop-current (mesh) method of analysis of electrical circuits.
12. What is Nodal analysis? Describe node voltage method in an electrical network.
13. State and prove Maximum power transfer theorem.
14. State and prove Reciprocity theorem.
15. State and prove Milliman's theorem.

PROBLEMS:

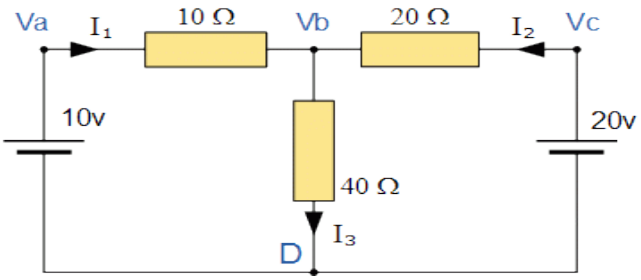
16. Find the mesh currents I_1 & I_2 using mesh analysis.



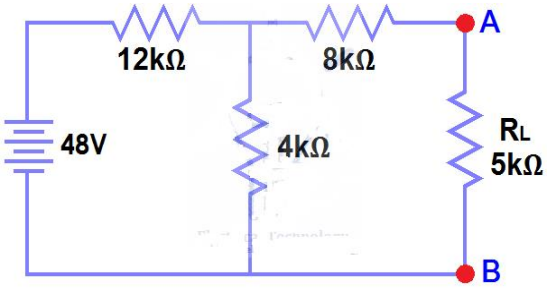
17. For the currents flowing through each loop using mesh analysis.



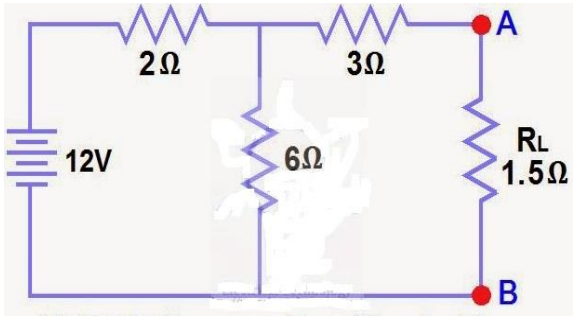
18. Calculate the total current I_3 using nodal analysis



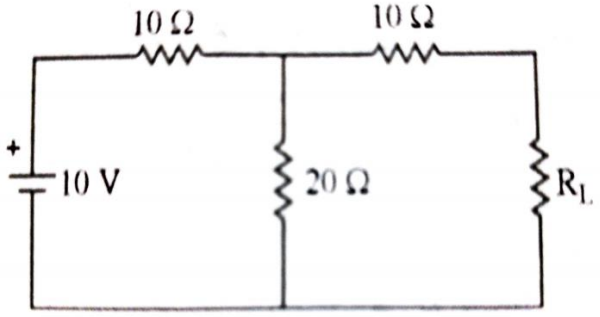
19. Calculate load current I_L using Thevenin's equivalent circuit.



20. Calculate the load current and load voltage using Norton's equivalent circuit.



21. Find the value of R_L for maximum power in the circuit of fig given below. Also find the maximum power.



MODULE-III: RC AND RL CIRCUITS

ESSAY QUESTIONS

22. Describe the frequency response of RC circuit for high pass filter circuit.
23. Describe the frequency response of RC circuit for low pass filter circuit.
24. Deduce an expression for resonant frequency of Series RLC circuit.
25. Deduce an expression for resonant frequency of Parallel RLC circuit.

SHORT ANSWER QUESTIONS

26. Describe the working of RC circuits as differentiating network.
27. Describe the working of RC circuits as integrating network.
28. Explain the working of RL circuits as differentiating network.
29. Explain the working of RL circuits as integrating network.
30. Describe the frequency response of RL circuit for high pass filter circuit.
31. Describe the frequency response of RL circuit for low pass filter circuit.
32. Define Q – factor? Calculate Q- factor of an LCR series resonant circuit.

PROBLEMS

33. In an RC low pass filter, the value of R is 5 KΩ and the cut off frequency is 1 kHz. Find the value of C.
34. A series RLC circuit has R =5 Ω, L=40mH and C=1μF. calculate i) the resonant frequency, ii) the Q of the circuit, iii) bandwidth.
35. Find the quality factor for an RLC series circuit with L=0.25mH, C=25μF and R=10ohm.
36. A series RLC circuit has Q=120 at resonance, a capacitance 200pF connected in series with an inductance of 150μH. calculate its bandwidth.
37. A coil of 10 Ω resistance and 0.1 H inductance is connected in parallel with a capacitor of 100 μF capacitance. Calculate the frequency at which the circuit will act as a non-inductive resistance.

MODULE-IV: BJT, FET & UJT

ESSAY QUESTIONS

38. Explain the input and output characteristics of CE configuration of BJT with diagrams.
39. Describe the construction and working of JFET.
40. Describe the construction and working of UJT.

SHORT ANSWER QUESTIONS

41. Deduce the relation between α, β & γ.
42. Discuss the advantages of FET over BJT.
43. Justify UJT as a Relaxation oscillator.

PROBLEMS

44. For a transistor $\beta = 40$ and $I_B = 25\ \mu A$. Find the value of I_E.
45. In a transistor, the base current is 0.08 mA and the emitter current is 9.6 mA. Find collector current, α & β.
46. In a field effect transistor when value of gate voltage is changed from (-3.0) volt to (-2.9) volt, the drain current increase for 1 mA to 1.2 mA. Find mutual conductance of transistor.
47. For an N-Channel JFET, $I_{DES} = 8.7$ mA, $V_1 = -3$V, $V_{GS} = -1$ Volt. Find the values of I_D and g_m.
48. A given silicon UJT has 20 volts between the bases. If the intrinsic standoff ratio is 0.6, find the value of standoff voltage and peak-point voltage.

MODULE-V: POWER SUPPLIES & PHOTO ELECTRIC DEVICES

ESSAY QUESTIONS

49. Explain the construction and working of half wave rectifier. Obtain expressions for efficiency & ripple factor.
50. Explain the construction and working of full wave rectifier. Obtain expressions for efficiency & ripple factor.
51. Explain the Construction &working of LED.

SHORT ANSWER QUESTIONS

52. What is a filter? Explain L-section filter.
53. What is a filter? Explain π-section filter.
54. Explain Three terminal voltage I.C. regulator (78XX).
55. Explain the operation of Photo diode.

	P. R. College (Autonomous), Kakinada	Program & Semester I B.Sc. Electronics (I Semester) W.e.f. 2022-23 Admitted batch			
Course Code **EL1205P**	**TITLE OF THE COURSE** **Circuit Theory & Electronic Devices**				
Demonstration	Hours Allocated: 30 (Practical)	L	T	P	C
Pre-requisites	Ohm's Law, A.C & D.C currents, Series connections & Parallel connections	-	-	2	1

Course Objectives:

1. To explain the basic concepts and laws of DC and AC electrical networks and solve them using mesh and nodal analysis techniques.
2. To understand the usage of CRO.
3. To construct passive circuits and verify different network theorems
4. To observe frequency response curves for various circuits.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Apply concepts of electric network topology, nodes, branches, loops to solve circuit problems including the use of computer simulation.
CO2	Apply time and frequency concepts of analysis.
CO3	Synthesize the network using passive elements.
CO4	Design and construction of a power supply

Course with focus on employability / entrepreneurship / Skill Development modules

Any **Five** experiments should be done.

1) Measurements of D.C & A.C voltage, frequency using CRO
2) Verification of Kirchhoff's laws
3) Thevenin's Theorem-verification
4) Norton's Theorem-verification
5) Maximum Power Transfer Theorem-verification
6) RC circuit-Frequency response (low and High pass)
7) RL circuit-Frequency response (low and High pass)
8) LCR series resonance circuits-Frequency response-Determination of Q and Band Width.
9) LCR parallel resonance circuits-Frequency response-Determination of Q and Band width

Web Links: (for Virtual labs)

1. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjMm-L674L7AhV8TGwGHfLuCMkQFnoECBAQAQ&url=http%3A%2F%2Fvlabs.iitb.ac.in%2Fvlabs-dev%2Flabs%2Fnetwork_lab%2Flabs%2Fexplist.php&usg=AOvVaw13eaWjw9g6Fts_GK2Jv8pm
2. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjMm-L674L7AhV8TGwGHfLuCMkQFnoECAsQAQ&url=http%3A%2F%2Fvlabs.iitkgp.ernet.in%2Fasnm%2F&usg=AOvVaw14PwYSMwwXRd1PWWSmei3t

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	3	3	3	1	-	-	1	3	3	1	2
CO2	3	2	3	3	2	3	3	1	-	3	2	3	2	3
CO3	2	3	3	2	3	2	3	-	1	2	2	2	3	2
CO4	3	3	2	2	2	2	3	-	1	1	3	3	2	3
Avg.														

	P. R. College (Autonomous), Kakinada	Program & Semester I B.Sc. (All Sciences groups) (I Semester) W.e.f. 2022-23 Admitted batch			
Course Code **SDCEA01**	**TITLE OF THE COURSE** **Electrical Appliances (Skill Development Course)**				
Teaching	Hours Allocated: 30 (Theory)	L	T	P	C
Pre-requisites	Electronic components viz. resisters, capacitors, Diodes, transistors transformer and their significance	2	-	-	2

Course Objectives:

1. To acquire necessary skills/hand on experience/ working knowledge on multimeters, galvanometers, ammeters, voltmeters, ac/dc generators, motors.
2. To acquire necessary skills/hand on experience/ working knowledge on transformers, single phase and three phase connections, basics of electrical wiring with electrical protection devices.
3. To Understand the working principles of different household domestic appliances.
4. To Check the electrical connections at house-hold but will also learn the skill to repair the electrical appliances for the general troubleshoots and wiring faults.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Acquire necessary skills/hand on experience/ working knowledge on multimeters, galvanometers, ammeters, voltmeters, ac/dc generators, motors.
CO2	Acquire necessary skills/hand on experience/ working knowledge on transformers, single phase and three phase connections, basics of electrical wiring with electrical protection devices.
CO3	Understand the working principles of different household domestic appliances
CO4	Check the electrical connections at house-hold but will also learn the skill to repair the electrical appliances for the general troubleshoots and wiring faults.

Course with focus on employability / entrepreneurship / Skill Development modules

Skill Development		Employability		Entrepreneurship	

Syllabus

Module - I (10 hrs.): Voltage, Current, Resistance, Capacitance. Inductance, Electrical conductors and Insulators. Ohm's law. Series and parallel combinations of resistors. Galvanometer. Ammeter. Voltmeter. Multimeter. Transformers, Electrical energy. Power. Kilowatt hour (KWH). Consumption of electrical power

Module - II (10 hrs.): Direct current and alternating current. RMS and peak values. Power factor. Single phase and three phase connections. Basics of House wiring. Star and delta connection Electric shock. First aid for electric shock. Overloading. Earthing and its necessity. Short circuiting. Fuses. MCB, ELCB. Insulation. Inverter. UPS.

Module - III (10 hrs.): Principles of working, parts and servicing of Electric fan. Electric Iron box, Water heater: Induction heater, Microwave oven: Refrigerator. Concept of illumination, Electric bulbs. CTL. LED lights, Energy efficiency in electrical appliances. IS codes & IE codes.

REFERENCE BOOKS:

1. A text book on Electrical Technology. B.L. Theraja. S.Chand& Co.
2. A text book on Electrical Technology. A.K. Theraja.
3. Performance and design of AC machines, M.G.Say, ELBS Edn.,
4. Handbook of Repair & Maintenance of domestic electronic appliances: BPB publications
5. Consumer Electronics. S.P.Bali. Pearson
6. Domestic appliances servicing. K.P. Anwer. Scholar institute publications

P.R. Government College (A), Kakinada.

Department of Physics & Electronics

Semester-1 Skill Development Course

w.e. f. 2022 - 23 Admitted Batch

Electrical Appliances - Question Bank

Essay Questions

UNIT - I

1. What is ohm's Law? Write the resultant resistances of series and parallel combination of resistors.
2. What is a capacitor? Write the expression for resultant capacity when the capacitors are connected in series and parallel.
3. What are electrical conductors and insulators? Give 2 examples for each

UNIT-2

4. What are single phase and three phase connections?
5. What is earthling and it's necessary in electrical wiring?
6. What do you mean by star and delta connections?

UNIT - 3

7. What are the various parts of an electric fan? explain its working.
8. Explain the working of refrigerator.
9. What is illumination? Write about various types of electric bulbs.

Short Questions

UNIT – 1

10. Write briefly on current, electrical power and kWh?

11. Mention the units of charge, electrical power, current, resistance, and capacitance**.**

12. Write any 3 differences between Galvanometer and Ammeter.

13. What is a transformer? Write the types of transformers.

14. Write the purpose of a Multi meter.

UNIT – 2

15. What are the abbreviations of AC and DC? Write a note on their conversions

16. What is meant by electric short circuiting?

17. What is Earthing and write its necessity.

UNIT – 3

18. Write a note on water heater

19. Identify different parts of an electrical fan

20. What is energy efficiency in electrical appliances?

21. Write a short note on IS codes & IE codes

P.R. Government College (A), Kakinada.

Department of Physics & Electronics

Semester-1 Skill Development Course

w.e. f. 2022 - 23 Admitted Batch

Electrical Appliances

Course Code: SDCEA01 No. of credits: 2 Hours/ Week: 2 Total hours: 30hrs

Note: Set the Question paper as per the blue print given at the end of this model paper

Time : 2 Hrs. Max. marks: 50

Blue Print

Module	Essay Questions 10 Marks	Short Questions 5 Marks	Marks allotted
Unit – I	2	3	35
Unit – II	2	2	30
Unit – III	2	3	35
Total Marks			100

P.R. Government College (A), Kakinada.

Department of Physics & Electronics

Semester-1 Skill Development Course

Electrical Appliances (Model Question Paper)

w.e. f. 2022 - 23 Admitted Batch

Time: 2 Hrs. Max Marks: 50

Section – A

Answer any **FOUR** questions. each question carry 5 marks. 4 x 5 = 20Marks

1. Explain the terms (i) Voltage and (ii) Current.
2. Write a short note on short circuiting?
3. Write about Galvanometer
4. What is the difference between Inverter and rectifier
5. What is the variation of Electrical energy and Power
6. Define IS codes and IE codes
7. What is the principle of Microwave oven
8. Explain the parts and servicing of Electric fan

Section – B

Answer any **THREE** questions . each question carry 10marks. 3x10M = 30 Marks

9. Explain about the series and parallel combinations of resistors

(OR)

Distinguish between Electrical conductors and Insulators

10. Discuss about single phase and three phase connections

(OR)

What is electric shock and Describe necessary steps for first aid for electric shock

11. Write the concept of illumination and Describe about LED light

(OR)

Distinguish between Water heater and Induction heater.

	P.R. Government College (Autonomous), Kakinada	Program & Semester I B.Sc. (I Sem) (A.Y. 2022 – 2023)			
Course Code	**Household Electrical Wiring** (Value Added Certificate Course)				
Teaching	Hours Allocated: 30 (**Theory**)	L	T	P	C
Pre-requisites:	Electronic components viz. resistors, capacitors, Diodes, transistors transformer and their significance, MCB, Testers, Household wiring equipment	2	0	-	2

Course Outcomes: After successful completion of the course the student will be able to

By successful completion of the course, students will be able to:

- Acquire necessary skills/hand on experience/ working knowledge on multi-meters, galvanometers, ammeters, voltmeters, ac/dc generators, motors, transformers, single phase and three phase connections, basics of electrical wiring with electrical protection devices.
- Understand the working principles of different household domestic appliances.
- Check the electrical connections at house-hold but will also learn the skill to repair the electrical appliances for the general troubleshoots and wiring faults.

SYLLABUS

Module – 1(5 hrs.)

Fundamentals of electricity: Concept of basic Electricity - Electric conductor, insulator and resistance.

Measurement of Electrical quantities: Voltage, Current, Resistance, Impedance, power factor and energy.

Basic Electrical Circuits: Single phase & three phase circuits - Serial connection- Different types of Series and Direct Board connections.

Module – 2(10 hrs.)

Different types of electrical wiring / installations:

Fans, Tube light, Heater, calling bell wiring - Two way switch wiring - Room wiring - 3 phase wiring.

Module – 3 (5 hrs.)

Testing procedure of voltage current /Importance of Earthling: Definition and testing procedure of voltage, current, power, MCB and bus bars - Earthling Connection – Different earthling systems.

Module – 4 (5 hrs.)

Tools and equipment: Tools required for marking punching, cutting, drilling, filing, stripping, crimping, socketing and fixing glands & screws etc., – Measuring Tools.

Module – 5 (5 hrs.)

Safety measures and precautions: General Safety of Tools & equipment - Fires in electrical Circuits - Precautions.

P. R. Government College (A), Kakinada.

Department of Physics & Electronics

I B.Sc. – Semester – I (A.Y. 2022 – 2023)

Course Code : **No. of Credits : 02**

Household Electrical Wiring

(Value Added Certificate Course)

Note:- Set the question paper as per the blue print given below.

Time: 1 Hrs. **Max. Marks: 50**

Blue Print

Module		No. of Qs.	Marks allotted
1	Fundamentals of electricity	10	10
2	Different types of electrical wiring / installations	20	20
3	Testing procedure of voltage current /Importance of Earthling	10	10
4	Tools and equipment	5	5
5	Safety measures and precautions	5	5
	TOTAL	**50**	**50**

- **Question paper will be set in the Multiple Choice Based**

	P. R. College (Autonomous), Kakinada	**Program & Semester** I B.Sc. Electronics (II Semester)			
Course Code **EL2205**	**TITLE OF THE COURSE Digital Electronics**				
Teaching	Hours Allocated: 60 (**Theory**)	L	T	P	C
Pre-requisites	Differences between analog & digital	-	4	-	4

Course Objectives:

1. To understand the number systems, Binary codes and Complements.
2. To understand the Boolean algebra and simplification of Boolean expressions.
3. To analyse logic processes and implement logical operations using combinational logic circuits.
4. To understand the concepts of sequential circuits and to analyse sequential systems in terms of state machines.
5. To understands characteristics of memory and their classification.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Students would learn about Various number systems and conversions among them.
CO2	Students would learn about De-Morgan Theorems, Boolean identities, Karnaugh maps and applications of them to calculate Sum of Products and Product of Sum of Boolean expressions.
CO3	They would also learn about various logic families like RTL, DTL, ECL, TTL, CMOS etc. and about universal logic gates.
CO4	Students would learn about Multiplexers, de-multiplexers, half adder, full adder and various flip flops like RS, JK, D, T, Master-slave flip flops.
CO5	They would also learn about Synchronous, Asynchronous counters, Up/Down counters, and their working.

Course with focus on employability / entrepreneurship / Skill Development modules

Skill Development		**Employability**		**Entrepreneurship**	

SYLLABUS

Module – I (12hrs)

NUMBER SYSTEM AND CODES:

Decimal, Binary, Hexadecimal, Octal- conversions Codes: BCD, Gray and Excess-3 codes Complements (1's and 2's), Addition - Subtraction using complement methods.

Module - II (12hrs)

BOOLEAN ALGEBRA AND THEOREMS:

Boolean Theorems, De-Morgan's laws. Digital IC logic gates, NAND & NOR as universal gates. Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh Map Method: 2,3 variables). ***4 Variable K-map. Don't care condition.***

Module - III (12hrs)

COMBINATIONAL DIGITAL CIRCUITS:

Adders-Half & full adder, Subtractor-Half and full subtractors, Parallel binary adder, Multiplexers (4:1) and Demultiplexers (1:4), Encoder (8-line-to-3- line) and Decoder (3-lineto-8-line).

IC-LOGIC FAMILIES: TTL logic(NAND Gate), CMOS Logic (NOR Gate) families.

MODULE - IV (12hrs)

SEQUENTIAL DIGITAL CIRCUITS:

Flip Flops: S-R FF , J-K FF, T and D type FFs, Master-Slave FFs, Registers:-Serial in Serial Out and Parallel in and Parallel Out, ***Serial in parallel out, parallel in serial out***. Counters Asynchronous-Mod-8,Mod10,Synchronous-4-bit.

MODULE - V(12hrs)

MEMORY DEVICES:

General Memory Operations, ROM, RAM (Static and Dynamic), Qualitative- PROM, EPROM, EEPROM, EAROM. ***Applications of memory devices***

Note: Topics in Bold & Italic are added to the syllabus.

TEXT BOOKS:

1. M.Morris Mano, " Digital Design " 3rd Edition, PHI, New Delhi.
2. Ronald J. Tocci. "Digital Systems-Principles and Applications" 6/e. PHI. New Delhi. 1999.(MODULES I to IV)
3. G.K.Kharate-Digital electronics-oxford university press
4. S.Salivahana& S. Arivazhagan-Digital circuits and design
5. Fundamentals of Digital Circuits by Anand Kumar.

REFERENCE BOOKS:

1. Herbert Taub and Donald Schilling. "Digital Integrated Electronics" . McGraw Hill. 1985.
2. S.K. Bose. "Digital Systems". 2/e. New Age International. 1992.

3. D.K. Anvekar and B.S. Sonade. "Electronic Data Converters : Fundamentals & Applications". TMH. 1994.
4. Melvino and Leach. " Digital Principles and Applications". TMG Hill Edition

Web Links:

1. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjNsJXG8YL7AhWsTmwGHflyBtgQFnoECBEQAQ&url=https%3A%2F%2Fwww.geeksforgeeks.org%2Fdifference-between-half-adder-and-full-adder%2F&usg=AOvVaw23KkntvfKGVA9o77QIs4s2
2. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjchfPp8YL7AhU3R2wGHXudBQUQFnoECDYQAQ&url=https%3A%2F%2Fwww.allaboutcircuits.com%2Ftextbook%2Fdigital%2Fchpt-11%2Fasynchronous-counters%2F&usg=AOvVaw3sA7DN9nW1SpARDh1jqqeC

Activities Proposed:

Measurable:

1. Assignments on Number systems, Binary Addition, Subtraction, Logic gates, SOP & POS, Adders, Subtractors, Multiplexers, Demultiplexers, Encoders, Decoders, TTL Logic family, CMOS logic family, Flip-flops, Registers, Counters, Memory devices.
2. Student seminars (Individual presentation of papers) on topics relating to Different types of coding systems, ASCII code, Boolean algebra, Karnaugh map simplification, Parallel binary adder, RTL logic family (for advanced learners), JK flip-flop, Registers, Mod counters, types of RAMS & types of ROMS.
3. Quiz Programmes on Number systems, Logic gates, Adders, Subtractors, Multiplexers, Demultiplexers, Encoders, Decoders, Logic families, Flip-flops, Registers, Counters, RAM & ROM.
4. Individual Field Studies/projects on designing Multiplexers, Demultiplexers, Encoders, Decoders, Mod counters.
5. Group discussion on Logic gates and its applications, Applications of Multiplexers & Demultiplexers, Encoders & Decoders, Registers & Counters, Memory devices.
6. Group/Team Projects on increasing the capacity of RAM/ROM in a personal computer

General:

4. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
5. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
6. Any similar activities with imaginative thinking.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	3	3	3	1	-	-	1	3	3	1	3
CO2	3	2	3	3	2	3	3	1	-	2	2	3	3	3
CO3	3	3	2	2	3	2	2	-	1	2	3	2	2	3
CO4	3	2	2	2	2	3	3	1	-	1	3	3	2	2
Avg.														

Topics Included / Deleted under Autonomous setup

Program : I B.Sc.
Semester : II
Course : II Electronics
Title of the course : Digital Electronics.

S. No.	Name of the Module	Topics Added	Justification
1	Module II	4 variable K-map & Don't care condition.	➢ In continuation with the previous topic. ➢ It is appropriate to include this topic in view of further studies and competitive exams.
2	Module IV	Serial in parallel out. Parallel in serial out.	➢ It is appropriate to include this topic in view of further studies and competitive exams.
3	Module V	Applications of memory devices.	➢ In continuation with the previous topic.

Total Percentage of addition: 20 %

P.R. GOVERNMENT COLLEGE (A), KAKINADA

Electronics - Semester – II

Paper – 2 [Code: EL2205]

w.e.f. 2022 - 23ADMITTED BATCH

Digital Electronics

4 Hours/Week [Total: 60 hrs.] **Credits: 4**

MODEL QUESTION PAPER

Note: -Set the question paper as per the blue print given.

Time: 2 Hrs. **Max.Marks:50**

Section	Questions to be given	Questions to be answered	Marks
A	6	3	3 x 10M = 30M
B	7	4	4 x 5 M = 20M
Total	13	7	50M

Blue Print

Module Name	Essay Questions 10 marks	Short Questions 5 marks	Problems 5 marks	Marks allotted
Number System and Codes	1	1	1	**20**
Boolean Algebra and Theorems	1	1	1	**20**
Combinational Digital Circuits	2	1	-	**25**
Sequential digital circuits	1	1	-	**15**
Memory devices	1	1	-	**15**
Total Marks				**95**

Note: At least two problems should be answered.

P.R. GOVERNMENT COLLEGE (A), KAKINADA
Electronics - Semester – II
Paper – 2 [Code: EL2205]
w.e.f. 2022 - 23ADMITTED BATCH

Digital Electronics

4 Hours/Week [Total: 60 hrs.] **Credits: 04**

MODEL QUESTION PAPER

Time: 2 hrs. **Max Marks: 50M**

Section - A

Answer any Three questions by choosing at least one question from each part

3 X 10 = 30 M

Part - A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 3

Part - B

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section - B

Answer any Four questions **4 X 5 = 20 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 2
9. Short answer question from Module - 3
10. Short answer question from Module - 4
11. Short answer question from Module - 5
12. Problem from Module – 1
13. Problem from Module – 2

QUESTION BANK
DIGITAL ELECTRONICS

MODULE-I: - Number system and codes:

ESSAY QUESTIONS

1. Explain 1's & 2's Complement of a number in binary system with example. Explain 2's complement method of subtraction by suitable example.
2. List out Binary Addition rules. Add the following using Binary addition
   (a) $(10111)_2$ and $(10101)_2$ (b) $(10110)_2$ and $(11011)_2$.

SHORT ANSWER QUESTIONS

3. Discuss the process of converting Binary to GRAY code.
4. Discuss the process of converting GRAY code to Binary.
5. Explain the process of converting BCD to Excess-3 code

PROBLEMS

6. Compute the following (1) $(11011)_2$ to $(\ ?\ )_{10}$ (2) $(78)_{10}$ to $(\ ?\ )_2$
7. Compute the Hexadecimal numbers (ACB) & (CAD) in to binary system.
8. Compute the following (a) $(\ ACB\ )_{16} \rightarrow (\ ?\ )_2$ (b) $(\ 11010101\ )_2 \rightarrow (\ ?\ )_{16}$
9. Compute the following (a) $(\ 1101.110\ )_2 \rightarrow (\ ?\ )_{10}$ (b) $(\ 56\ )_{10} \rightarrow (\ ?\ )_2$
10. Determine the equivalent Binary for the Gray (10011)

MODULE-II: - Boolean algebra and theorems:

ESSAY QUESTIONS

11. State and Prove Demorgan's theorems.
12. Define k-map? Explain two and three variable k-map representation by using example.
13. Define K-map? Simplify the following 3 variable K-map by using SOP method $F(ABC)=\sum m(0,1,2,3,5,7)$
14. Define K-map? Simplify the following 3 variable K-map by using SOP method $F(ABCD)=\sum m(0,1,2,3,5,7,8,10,12,14,15)$

SHORT ANSWER QUESTIONS

15. Describe AND, OR & NOT logic gates with their truth tables.
16. Explain NAND, NOR, EX-OR, EX-NOR login gates with their truth tables
17. Explain how AND, OR and NOT gates are realized from NAND & NOR gates.

PROBLEMS

18. Justify that **AB + A(B+C) + B(B+C) = B+AC**
19. Generate a two variable K-map by using SOP method for $F(A,B) = \sum m(0,3)$.
20. Reduce $F(A,B,C) = \pi M(0,1,3,4,5,7)$ using 3 variable k-map POS method.

MODULE-III: - Combinational Digital circuits:

ESSAY QUESTIONS

21. Construct and verify the truth table of half adder and full adder
22. Design 4: 1 Multiplexer & explain it with diagram.
23. Explain the construction and working of NAND gate using TTL logic with neat diagram.

SHORT ANSWER QUESTIONS

24. Describe the circuit of parallel binary adder and explain its operation.
25. Explain Half subtractor by using truth table.
26. Explain Full subtractor by using truth table.
27. Describe Demultiplexers.
28. Construct 8-line-to-3-line Encoder.
29. Construct 3-line-to-8-line Decoder.
30. Explain CMOS Logic in brief with diagram.

MODULE-IV: - Sequential Digital circuits:

ESSAY QUESTIONS

31. Define flip flop? Draw the circuit of J-K flip flop and Describe its working with the help of truth table.
32. Define Shift registers? Explain the construction and working of Serial-In-Serial-Out shift register.
33. Define counter? Design and explain Mod-10 counter.

SHORT ANSWER QUESTIONS

34. Illustrate the working of master slave JK flip flop with truth table.
35. Explain SR flip flop with truth table.
36. Illustrate D flip flop with truth table.
37. Explain T flip flop with truth table.
38. Illustrate the working of PIPO shift register.
39. Design and explain Asynchronous Mod-8 counter.
40. Explain Synchronous 4-bit counter.

MODULE-V: - Memory Devices:

ESSAY QUESTIONS

41. Describe the action of ROM. Describe its working.
42. Explain briefly about RAM.
43. Distinguish between SRAM and DRAM.

SHORT ANSWER QUESTIONS

44. Discuss briefly about PROM
45. Describe briefly about EPROM.
46. Explain briefly about EERPOM.
47. Discuss briefly about EAROM
48. List any 5 applications of memory device.

	P. R. College (Autonomous), Kakinada	Program & Semester I B.Sc. Electronics (II Semester)			
Course Code **EL2205P**	**TITLE OF THE COURSE Digital Electronics**				
Demonstration	Hours Allocated: 30 (Practical)	L	T	P	C
Pre-requisites	Boolean laws	-	-	2	1

Course Objectives:

1. To explain the operation of various logic gates and verify its truth tables.
2. To learn about Boolean identities & De-Morgan's theorems
3. To construct Half adder, Full adder, half subtractor, Full subtractor and verify its output.
4. To construct RS, JK, D & T flip-flops and observe its output
5. To design Synchronous counter, and Asynchronous mod counter and observe its output

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Learnt about various gates and realization of logic gates from Universal gates
CO2	Learnt about Boolean laws and Demorgan's theorems.
CO3	Learnt about construction of Half & Full adder, Half & Full Subtractor and design of various Multiplexers, Demultiplexer, Encoder & Decoder.
CO4	Learnt about Design and construction of various flip-flops.

Course with focus on employability / entrepreneurship / Skill Development modules

Any **Five** experiments should be done.

1. Verification of IC-logic gates.
2. Realization of basic gates using discrete components (resistor, diodes & transistor)
3. Realization of basic gates using Universal gates (NAND & NOR gates)
4. Verify Half adder and full adder using gates
5. Verify Half subtractor and full subtractor using gates.
6. Verification of Demorgan's laws.
7. Verify the truth table Multiplexer and demultiplexer.
8. Verify the truth table Encoder and decoder.
9. Verify the truth table of RS , JK, T flip-flops

Web Links:

1. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiKoszz8oL7AhWYSGwGHWQ4AyQQFnoECA8QAQ&url=https%3A%2F%2Fde-iitr.vlabs.ac.in%2Fexp%2Ftruth-table-gates%2Ftheory.html&usg=AOvVaw1-JOCEC-uNzYFye2qPgCUD
2. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiKoszz8oL7AhWYSGwGHWQ4AyQQFnoECCYQAQ&url=https%3A%2F%2Fvlab.amrita.edu%2Findex.php%3Fsub%3D59%26brch%3D165%26sim%3D903%26cnt%3D2&usg=AOvVaw2hdnUGYO3BJC9IGowNuwQw

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	2	3	3	2	-	-	2	3	3	1	3
CO2	2	2	3	3	2	3	3	1	-	3	2	2	2	3
CO3	3	3	3	3	3	2	2	1	1	2	3	3	2	2
CO4	3	2	2	2	2	3	3	-	1	1	2	3	3	3
Avg.														

	P. R. College (Autonomous), Kakinada	Program & Semester			
Course Code **EL3205**	**TITLE OF THE COURSE** **Analog Circuits & Communication**	II B.Sc. Electronics (III Semester)			
Teaching	Hours Allocated: 60 (**Theory**)	L	T	P	C
Pre-requisites	Voltage & Current divider rule,	4	-	-	4

Course Objectives:

1. To understand the concepts, working principles and key applications of linear integrated circuits.
2. To perform analysis of circuits based on linear integrated circuits.
3. To design circuits and systems for particular applications using linear integrated circuits.
4. To introduce students to various modulation and demodulation techniques of analog communication.
5. To analyze different parameters of analog communication techniques
6. It also focuses on Transmitters and Receivers.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Students would learn about basic op-Amp circuits, inverting, non-inverting amplifiers, frequency response of op-Amp. They would also learn about the interpretation of op-Amp data sheets.
CO2	Students would learn about the applications of op-Amps for various mathematical operations, usage of op-Amp as oscillators, and voltage regulators.
CO3	Students would learn about basics of communication systems, AM, FM and PM. They would also learn about the basics of Amplitude Modulation, modulator & demodulator circuits.
CO4	Students would learn about the concepts of Frequency Modulation, generation and detection of FM waves, advantages of FM over AM and block diagrams of AM and FM radio receivers.

Course with focus on employability / entrepreneurship / Skill Development modules

Skill Development		Employability		Entrepreneurship	

SYLLABUS

MODULE – I (12hrs)
OPERATIONAL AMPLIFIERS:
Definition of Op-amp, Characteristics of Op-Amp, op-amp parameters, Block diagram of op-amp, inverting, virtual ground, non-inverting, summing amplifier, subtractor (differential amplifier), voltage follower, integrator, differentiator, Logarithmic amplifier.

MODULE - II(12hrs)
OP-AMP CIRCUITS:
Voltage regulator, comparator, Schmitt trigger (square wave generator), sine wave generator (Wien's bridge), Active filters (Basics)-low pass, high pass filters IC-555 – functional block diagram, *Monostable and Astable Multivibrator* and mention it's applications

MODULE – III (12Hrs)
AMPLITUDE MODULATION:
Need for modulation, *Equation of AM Wave*, amplitude modulation-frequency spectrum of AM wave, *bandwidth of AM Wave*, power relations in the AM wave. Generation of AM- simple diode modulator. Detection of AM signals – Diode detector.

MODULE - IV (12hrs)
FREQUENCY MODULATION:
Theory of FM, Frequency deviation and carrier swing, modulation index, deviation ratio, percent modulation. Mathematical representation of FM, frequency spectrum and bandwidth of FM waves, Generation of FM signals – Varactor diode modulator. Detection of FM waves – Ratio detector.

MODULE - V (12hrs)
RADIO BROADCASTING AND RECEPTION:
Spectrum of electromagnetic waves, Radio broadcasting and reception, types of wave propagation, Transmitter (block diagram), AM receiver- block diagram, Super heterodyne receiver. FM receiver- Block diagram

Note: Topics in Bold & Italic are added to the syllabus

Text books:

1. **Op Amp and Linear Integrated Circuits by Ramakant Gaikwad**
2. **Linear Integrated Circuits By Roy Choudhary**
3. **Unified Electronics Vol II – J.P. Agarwal and Amit Agarwal.**
4. **Electronic Communications - George Kennedy**

5. **Antennas and Wave Propagation – G.S.N.Raju – PHI**
6. **Principles of communication system –Herbert Taub & D.L.Schilling**

Reference books:

1. **Jacob Millan, Micro Electronics, McGraw Hill.**
2. **Mithal G K, Electronic Devices and Circuits Thana Publishers.**
3. **Allan Mottershead ,Electronic Devices and Circuits – An Introduction- Prentice Hall**
4. **Electronic Communications – Roody & Colen**
5. **Communication Systems – Hayken --- 4 th Edition**
6. **Modern digital and analog communication system –B.P. Lathi**

Web Links:

1.
2.

Activities proposed:

Measurable:

1. Assignments on inverting amplifier, non-inverting amplifier, voltage follower integrator, differentiator, voltage regulator, square wave generator, Wien bridge oscillator, Active filters, IC-555 timer, Equation of AM wave, Amplitude modulator, Demodulation, Generation of FM, FM demodulator, Radio broadcasting & reception, super heterodyne receiver.
2. Student seminars (Individual presentation of papers) on topics relating to inverting amplifier, non-inverting amplifier, integrator, differentiator, logarithmic amplifier, square wave generator, sinewave generator, active filters, IC-555 timer applications, Different modulation & demodulation techniques of AM & FM, Electromagnetic spectrum and its applications, AM & FM transmitters, different types of receivers employed in AM & FM.
3. Quiz Programmes on op-amp characteristics & parameters, applications of op-amp, modulation & demodulation techniques in AM & FM, electromagnetic spectrum, AM & FM transmitters, AM & FM receivers.
4. Individual Field Studies/projects on designing voltage regulators(Series & Shunt) using op-amp, output voltage regulation using IC-555 timer, design of PWM circuit using IC-555 timer.
5. Group discussion on applications of op-amp, applications of IC-555 timer, radio broadcasting and reception.
6. Group/Team Projects on designing a simple radio transmitter & receiver.

General:

7. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
8. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers

9. Any similar activities with imaginative thinking.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	3	3	3	1	-	-	1	3	3	1	3
CO2	3	3	3	3	2	2	3	1	1	2	2	2	2	2
CO3	2	2	2	2	3	2	1	-	1	3	3	2	2	2
CO4	3	2	2	3	2	2	3	-	-	1	3	3	2	3
Avg.														

Topics Included / Deleted under Autonomous setup

Program : II B.Sc.
Semester : III
Course : III Electronics
Title of the course : Analog circuits & Communication.

S. No.	Name of the Module	Topics Added	Justification
1	Module II	Monostable multivibrator. Astable multivibrator.	➢ It is appropriate to include this topic in view of further studies and competitive exams.
2	Module III	Equation of AM. Bandwidth of AM.	➢ It is appropriate to include this topic in view of further studies and competitive exams. ➢ For better understanding of the subject.

Total Percentage of addition: 20 %

P.R.GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. II Year - Electronics – Semester – 3
PAPER – 3 [Code: EL3205]
w.e.f. 2021 - 22 ADMITTED BATCH

ANALOG CIRCUITS AND COMMUNINATION

4 Hours/Week [Total: 60 hrs.] **Credits: 04**

MODEL QUESTION PAPER

Note: - Set the question paper as per the blue print given.

Time: 2 Hrs. **Max.Marks:50**

Section	Questions to be given	Questions to be answered	Marks
A	6	3	3 x 10M = 30M
B	7	4	4 x 5 M = 20M
Total	13	7	50M

Blue Print

Module Name	Essay Questions [10 marks]	Short Questions [5 marks]	Problems [5 marks]	Marks allotted
Operational Amplifiers	1	1	1	20
Op-Amp Circuits	2	0	1	25
Amplitude Modulation	1	1	1	20
Frequency Modulation	1	1	-	15
Radio Broadcasting and Reception	1	1	-	15
Total Marks				95

Note: At least two problems should be answered.

P.R.GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. II Year - Electronics – Semester – 3
PAPER – 3 [Code: EL3205]
w.e.f. 2021 - 22 ADMITTED BATCH

ANALOG CIRCUITS AND COMMUNINATION

4 Hours/Week [Total: 60 hrs.] **Credits: 04**

MODEL QUESTION PAPER

Time: 2 hrs. **Max Marks: 50M**

Section - A

Answer any Three questions by choosing at least one question from each part

3 X 10 = 30 M

Part - A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 2

Part - B

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section - B

Answer any Four questions **4 X 5 = 20 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 3
9. Short answer question from Module - 4
10. Short answer question from Module - 5
11. Problem from Module - 1
12. Problem from Module – 2
13. Problem from Module – 3

ANALOG CIRCUITS AND COMMUNINATION
QUESTION BANK

Module - I: Operational Amplifiers
ESSAY QUESTIONS

1. Sketch the circuit diagram of Inverting amplifier and explain its operation.
2. Sketch the circuit diagram of Non inverting amplifier and explain its operation
3. Sketch and explain Op-Amp application as Integrator and Differentiator with output waveforms.

SHORT ANSWER TYPE QUESTIONS

4. Explain the block diagram of Op-Amp
5. List out the characteristics of an ideal Op-Amp.
6. Explain the concept of virtual ground.
7. Describe the working of Op-Amp as Logarithmic amplifier.
8. Explain Op- Amp as summing amplifier.
9. Describe Op-Amp act as voltage follower.
10. Explain how an Op-amp can be constructed as differential amplifier (subtractor)

PROBLEMS

11. For a given Op-Amp, CMRR = 10^4 and differential gain $A_d = 10^4$. Determine the common mode gain A_c of Op-Amp.
12. An inverting amplifier has R_1 =10 KΩ and R_f = 150 KΩ. Compute its output voltage & the input resistance. The input current for an input voltage of 1V.
13. Calculate the output voltage of a non-inverting multiplier with R_1 = 100 KΩ, R_f =600 KΩ and V_{in} = 2V
14. Calculate the output voltage of an OP-AMP summing amplifier for the following set of voltages and resistors. R_f =10 KΩ, V_1 **= 6** V, V_2 = 3 V, V_3 = 0.8 V, R_1 = 10 KΩ, R_2 = 5 KΩ, R_3 = 6 KΩ.
15. In a Subtractor circuit if R_1 = 10kΩ, R_f = 10KΩ, V_1 = 5V and V_2 = 10V. Calculate its output voltage.
16. The input to the differentiator circuit is a sinusoidal voltage of peak value 5 mV and frequency 1 kHz. Calculate its output voltage if R= 10KΩ and C = 1μF.

Module-II: Op-Amp applications
ESSAY QUESTIONS

17. Describe the working of Op- Amp as Series Voltage regulator.
18. Explain the construction and working of Sine wave generator (Wien's bridge) using Op-Amp.
19. Explain the construction and working of square wave generator (Schmitt trigger) using Op-Amp.
20. Discuss the construction & working of Monostable multivibrator circuit using IC555.

21. Explain the construction & working of Astable multivibrator using IC555.

SHORT ANSWER TYPE QUESTIONS

22. Explain the working of Op-Amp as comparator.
23. Explain how Op-Amp acts as low pass filter
24. Explain how Op-Amp acts as high pass filters.
25. Explain how Op-Amp acts as band pass filter.
26. Sketch and identify different pins of Timer IC-555.
27. List out the applications of IC 555 timer.

PROBLEMS

28. For a Schmitt trigger circuit, calculate threshold voltage levels and hysteresis. Given that R_1= 51 KΩ, R_2 = 120 Ω, +V_{CC} = 15 V. Assume that Vsat = 0.9 V_{CC}
29. Calculate the value of R_2 (feedback resistor) and C. Given that R1 = 1 KΩ, R = 100 KΩ, with oscillator frequency of 100 KHz in case of Wien's bridge oscillator.
30. For a monostable multivibrator using 555 timer, the values of resistance R= 100 KΩ and the time delay T= 100 ms. Calculate the value of C.

Module – 3 : Amplitude modulation

ESSAY QUESTIONS

31. Define amplitude modulation. Derive the equation of an AM wave.
32. Explain how AM waves are produced by using diode modulator.

SHORT ANSWER TYPE QUESTIONS

33. Explain Need for modulation.
34. Explain the frequency spectrum of AM wave.
35. Deduce power relations in the AM wave.
36. Illustrate how AM waves are detected using diode.

PROBLEMS

37. An AM wave is represented by the expression $(e_c)_{AM}$ = 7.5 (1+0.6cos 6280 t) cos (10^6 πt) V. Calculate the maximum and minimum amplitude of AM wave.
38. The antenna current of an AM transmitter is 8 A when only the carrier is sent but it increases to 8.93 A when the carrier is modulated. Calculate percent modulation.
39. The load current in the transmitting antenna of an unmodulated AM transmitter is 6 amp. What will be the antenna current when modulation is 60%?
40. A carrier wave of 1000W is subjected to 100% modulation. Calculate:
    (1) Power of modulated wave
    (2) Power in USB
    (3) Power in LSB
41. In an amplitude modulated wave, the audio signal and carrier signal are given by 20 sin 2π (1500t) and 100 sin 2π (10^5t). Calculate the frequencies of signal and carrier wave and Percentage modulation.

Module – 4 : Frequency modulation

ESSAY QUESTIONS

42. Explain how FM waves are produced by using Varactor diode modulator
43. Explain reception of FM waves using Ratio detector.

SHORT ANSWER TYPE QUESTIONS

44. Obtain equation of FM wave.
45. Describe Frequency deviation and carrier swing of FM wave.
46. Define and explain modulation index of FM wave. What is percent modulation?
47. Plot and explain the frequency spectrum of FM wave. Write a note on bandwidth of FM wave.
48. Write a note on power relations in the FM wave.

Module – 5: Radio Broadcasting and Reception

ESSAY QUESTIONS

49. Describe electromagnetic spectrum in its broad classification**.**
50. Sketch the block diagram of an AM super heterodyne receiver and explain each block.
51. Explain different types of wave propagation.

SHORT ANSWER TYPE QUESTIONS

52. Explain radio broadcasting and reception system
53. Describe the working of transmitting antenna with the help of neat diagram.
54. Sketch the block diagram of FM receiver. Explain each block.

	P. R. College (Autonomous), Kakinada	Program & Semester II B.Sc. Electronics (III Semester)			
Course Code **EL3205P**	**TITLE OF THE COURSE** **Analog circuits & Communication**				
Demonstration	Hours Allocated: 30 (Practical)	L	T	P	C
Pre-requisites	Boolean laws	-	-	2	1

Course Objectives:

1. To explain the operation of operational amplifier.
2. To learn about ideal characteristics & parameters of op-amp.
3. To calculate the output voltage, gain for inverting and non-inverting amplifiers.
4. To construct different analog circuits like voltage adder, voltage follower, integrator, differentiator and observe its output.
5. To study modulation and demodulation process of AM & FM

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Learnt about output voltage gain for inverting & non-inverting amplifiers.
CO2	Learnt about the application of op-amp as adder circuit & voltage follower.
CO3	Learnt about the application of IC 555 timer as astable multivibrator.
CO4	Learnt about the modulation and demodulation of AM wave.

Course with focus on employability / entrepreneurship / Skill Development modules

Any **Five** experiments should be done.

1. Op-Amp as non-inverting amplifier.
2. Op-Amp as inverting amplifier.
3. Op-Amp as voltage follower.
4. Op-Amp as integrator and differentiator
5. Op-Amp as adder.
6. Astable multivibrator using IC 555.
7. Op-Amp as voltage to current converter.
8. Op-Amp as square wave generator.
9. Amplitude modulation and demodulation.
10. AM as Transmitter and Receiver.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	3	3	3	2	1	-	1	3	3	1	3
CO2	2	2	3	2	2	3	3	1	1	3	2	2	2	2
CO3	3	3	3	3	3	2	2	1	1	3	2	3	2	2
CO4	3	3	2	2	2	2	3	-	1	1	3	3	3	3
Avg.														

	P.R. Government College (Autonomous), Kakinada	Program & Semester II B.Sc. (III Sem) (A.Y. 2022 – 2023)			
Course Code	**SOLDERING & DE-SOLDERING OF COMPONENTS (Skill Development Course)**				
Teaching	Hours Allocated: 30 (**Theory**)	L	T	P	C
Pre-requisites:	Basic idea about Latitudes and Longitudes, Introduction to semiconductors, PN junction diode and its characteristics	2	0	-	2

Module – 1(6 hrs.)

Soldering Tools - Different types of Soldering Guns related to Temperature and wattages, types of tips, Solder materials and their grading, types of soldering De soldering using Pump and wick.

Module – 2(6 hrs.)

Soldering and De Soldering Stations - Soldering and De Soldering Stations and their Specifications, Safety precautions while Soldering & De soldering, Preparing Component for Soldering and De soldering.

Module – 3 (6 hrs.)

Printed Circuit Boards- Types of PCB, Soldering Basic Components on PCB.

Module – 4 (6 hrs.)

Surface Mount Device components - Introduction of SMD Components, Soldering the SMD components on the PCB.

Module – 5 (6 hrs.)

Identification of Faults - Identification of loose/dry solder, broken tracks on printed wire assemblies & discrete components mounted circuit boards , Join the broken PCB track and test.

Text books & Reference books

1. Principles of Reliable Soldering Techniques, Author R. Sengupta, Published by New Age International
2. Surface Mount Technology: Principles and Practice by Ray Prasad, Published by Springer Science, 4.
3. Complete PCB Design Using OrCad Capture and Layout, Author Kraig Mitzner, Published by Newnes.

Web Links:

http://spokentutorial.org/watch/KiCad/Designing+printed+circuit+board+in+KiCad/Hindi/2.

P.R. Government College (A), Kakinada.

Department of Physics & Electronics

II B.Sc. – Semester – III (A.Y. 2022 – 2023)

SOLDERING & DE-SOLDERING OF COMPONENTS
(Skill Development Course)

Course Code : **No. of credits : 02**

Hour/Week :2 Total Hours : 30

Note:- Set the question paper as per the blue print given below.

Time: 1 Hrs. **Max. Marks: 50**

Blue Print

Module		No. of Qs.	Marks allotted
1	**Soldering Tools**	10	10
2	**Soldering and De Soldering Stations**	20	20
3	**Printed Circuit Boards**	10	10
4	**Surface Mount Device components**	5	5
5	**Identification of Faults**	5	5
	TOTAL	50	50

- **Question paper will be set in the Multiple Choice Based**

	P. R. College (Autonomous), Kakinada	**Program & Semester** II B.Sc. Electronics (IV Semester) Paper - IV			
Course Code **EL4205**	**TITLE OF THE COURSE** **Microprocessor Systems**				
Teaching	Hours Allocated: 60 (**Theory**)	L	T	P	C
Pre-requisites	Multiplexing, Demultiplexing, Memory organization	4	-	-	4

Course Objectives:

1. To understand basic architecture of 16 bit and 32 bit microprocessors.
2. To understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design.
3. To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors.
4. To understand RISC based microprocessors.
5. To understand concept of multi core processors.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	The student can gain good knowledge on microprocessor and implement in practical applications
CO2	Design system using memory chips and peripheral chips for 16 bit 8086 microprocessor.
CO3	Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors.
CO4	Understand multi core processor and its advantages

Course with focus on employability / entrepreneurship / Skill Development modules

Skill Development		**Employability**		**Entrepreneurship**	

SYLLABUS

MODULE -I: (12 Hrs.)
CPU ARCHITECTURE:

Introduction to Microprocessor, INTEL -8085 – Architecture of 8085, CPU, ALU unit, Register organization, Address, data and control Buses. Pin configuration of 8085. ***Flag register***, *Interrupts – maskable, non-maskable, hardware & software interrupts.* Addressing modes of 8085. Instruction format.

MODULE -II: (12 Hrs.)
8085 Instruction Set:

Instruction set - Data transfer Instruction, Logical Instructions, Arithmetic Instructions, Branch Instructions, Machine Control instructions.

MODULE -III: (12 Hrs.)
Assembly Language Programming using 8085:

Programs for Addition, Subtraction, Multiplication, Division, largest and smallest number in an array.

MODULE -IV: (12 Hrs.)
8086:

Architecture of 8086, ***Register organization, Flag register***, Addressing modes of 8086, instruction format. Basic 8086 Configurations – Minimum mode and Maximum Mode, Interrupts. I/O Interfaces: Serial Communication interfaces (8251), Keyboard and display(8279) (block diagram), DMA controller (8257)(block diagram).

MODULE -V: (12 Hrs.)
Arm Processor:

Introduction to 16/32 bit processors, Arm architecture & organization, Arm based MCUs, Instruction set.

Note: Topics in Bold & Italic are added to the syllabus.

Text books:

1. **Microprocessor Architecture, Programming and Applications with the 8085 – Penram International Publishing, Mumbai.- Ramesh S. Gaonakar**
2. **Microcomputer Systems the 8086/8088 family – YU-Cheng Liu and Glenn SA Gibson**
3. **Microcontrollers Architecture Programming, Interfacing and System Design– Raj Kamal Chapter: 15.1, 15.2, 15.3, 15.4.1**
4. **8086 and 8088 Microprocessor by Tribel and Avatar Singh.**

REFERENCES:

1. **Microprocessors and Interfacing – Douglas V. Hall**
2. **Microprocessor and Digital Systems – Douglas V. Hall**
3. **Advanced Microprocessors & Microcontrollers - B.P. Singh & Renu Singh – New Age**
4. **The Intel Microprocessors – Architecture, Programming and Interfacing – Bary B. Brey.**
5. **Arm Architecture reference manual –Arm ltd**

Web Links:

1.
2.

Activities proposed

Measurable:

1. Assignments on types of buses, 8085 Architecture, pin diagram, register organisation, types of interrupts, instruction set, 8086 architecture, pin diagram, register organisation, maximum mode configuration, minimum mode configuration. Interfacing of USART, interfacing of Keyboard & display and DMA controller. Comparison of ARM processor with other processors.
2. Student seminars (Individual presentation of papers) on topics relating to different types of architectures (8085, 8086, ARM processor, 8251, 8279, 8257), interrupts and their significance, pin diagram of various ICs, register organisations of various ICs
3. Quiz Programmes on architecture, instruction set, instruction format, applications of various processors, modes of processors.
4. Individual Field Studies/projects on interfacing of steeper motor to 8085, 8086.
5. Group discussion on programs.
6. Group/Team Projects on interfacing a peripheral device to 8086 using PC.

General:

7. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
8. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
9. Any similar activities with imaginative thinking.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	3	3	3	3	1	-	1	1	3	3	1	3
CO2	2	3	3	3	2	2	3	1	-	2	2	3	2	2
CO3	3	2	3	2	3	2	2	-	1	2	2	2	2	2
CO4	2	3	2	3	2	2	2	1	-	1	3	2	2	3
Avg.														

Topics Included / Deleted under Autonomous setup

Program : II B.Sc.
Semester : IV
Course : IV Electronics
Title of the course : Microprocessor systems.

S. No.	Name of the Module	Topics Added	Justification
1	Module I	Flag register Interrupts: maskable, non-maskable, vectored & non-vectored	➢ In continuation with the previous topic. ➢ It is appropriate to include this topic in view of further studies and competitive exams.
2	Module IV	Register organization. Flag register	➢ Clear understanding about 8086 microprocessors. ➢ It is appropriate to include this topic in view of further studies and competitive exams.

Total Percentage of addition: 20 %

P.R.GOVERNMENT COLLEGE (A), KAKINADA

Electronics-Semester - IV

Paper – 4 [Code: EL4205]

w.e.f. 2021 - 22 ADMITTED BATCH

Microprocessor Systems

4 Hours/Week [Total: 50 hrs.] **Credits: 04**

MODEL QUESTION PAPER

Note: - Set the question paper as per the blue print given.

Time: 2 Hrs. **Max.Marks:50**

Section	Questions to be given	Questions to be answered	Marks
A	6	3	3 x 10M = 30M
B	7	4	4 x 5 M = 20M
Total	13	7	50M

Blue Print

Module Name	Essay Questions [10 marks]	Short Questions [5 marks]	Programs [5 marks]	Marks allotted
CPU Architecture	1	2	-	20
8085 Instruction set	2	1	-	25
Assembly language programming using 8085	1 (Program)	-	2	20
8086	1	1	-	15
ARM Processor	1	1	-	15
Total Marks				95

P.R.GOVERNMENT COLLEGE (A), KAKINADA
Electronics-Semester - IV
Paper – 4 [Code: EL4205]
w.e.f. 2021 - 22 ADMITTED BATCH

Microprocessor Systems

MODEL QUESTION PAPER

Time: 2 hrs. **Max Marks: 50 M**

Section - A

Answer any Three questions by choosing at least one question from each part

3 X 10 = 30 M

Part – A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 2

Part – B

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section - B

Answer any Four questions **4 X 5 = 20 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 1
9. Short answer question from Module - 2
10. Short answer question from Module - 4
11. Short answer question from Module - 5
12. Program from Module – 3
13. Program from Module – 3

QUESTION BANK
MICROPROCESSOR SYSTEMS

UNIT-I: CPU Architecture
ESSAY QUESTIONS

1. Plot the pin diagram of 8085 & explain each pin functioning.
2. Plot the Block diagram of Intel 8085 and explain each block.
3. Explain the addressing modes of 8085 with give examples.

SHORT QUESTIONS

4. Explain 8085 bus organization.
5. Analyse software, hardware, maskable and non-maskable interrupts in 8085.
6. Describe hardware interrupts.
7. Describe 8085 flag register.
8. Explain Instruction formats.

UNIT-II: 8085 Instruction Set
ESSAY QUESTIONS

9. List out data transfer instructions? Explain any five data transfer instructions.
10. Describe any five arithmetic group of instruction.
11. Explain any five branch group of instruction.

SHORT QUESTIONS

12. Explain increment and decrement group of instructions.
13. Describe any three logical group of operations
14. Explain DI & EI instructions
15. Give a note on RIM & SIM instructions.

UNIT-III: Assembly Language Programming using 8085
ESSAY QUESTIONS

16. Write a program on addition of two 16 bit numbers
17. Write a program on subtraction of two 16 bit numbers.
18. Write a program on largest of set numbers each of 8-bit.

SHORT QUESTIONS

19. Write a program on subtraction of two 8-bit numbers.
20. Write a program on multiplication of two 8-bit numbers.
21. Write a program on addition of two 8 bit numbers.
22. Write a program on smallest of set numbers each of 8-bit.
23. Write a program on division of two 8 bit numbers.

UNIT-IV: 8086
ESSAY QUESTIONS

24. Explain minimum mode configuration of 8086.

25. Explain maximum mode configuration of 8086.
26. Explain the addressing modes of 8086 with give examples.
27. Describe 8086 register organization.

SHORT QUESTIONS

28. Draw the Block diagram of Intel 8086 and identify each block.
29. Describe 8086 flag register.
30. Draw the block diagram of Keyboard and display(8279).
31. Draw the block diagram of DMA controller (8257).
32. Sketch the block diagram of USART (8251) and identify each block.
33. Discuss interrupts in 8086.

UNIT-V: ARM Processor

ESSAY QUESTIONS

34. Sketch the architecture of ARM processor.
35. Explain the addressing modes of ARM processor.

SHORT QUESTIONS

36. Discuss the features of ARM processor?
37. Give the instruction set of ARM processor.

	P. R. College (Autonomous), Kakinada	Program & Semester			
Course Code **EL4205P**	**TITLE OF THE COURSE** **Microprocessor Systems**	II B.Sc. Electronics (IV Semester) Paper - IV			
Demonstration	Hours Allocated: 30 (Practical)	L	T	P	C
Pre-requisites	Opcodes of 8085	-	-	2	1

Course Objectives:

1. To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors.
2. To understand the execution of programs by using simulator.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Learnt about microprocessor instruction set and its usage
CO2	Learnt about algorithm and flow chart preparation for better understanding of program writing.
CO3	Learnt about techniques for faster execution of instructions to improve the speed of operation and performance.
CO4	Learnt about interfacing of different peripherals and to observe its operation.

Course with focus on employability / entrepreneurship / Skill Development modules

Any **Five** experiments should be done

1. Addition (8 – Bit)
2. Subtraction (8 – bit)
3. Addition (16-bit)
4. Subtraction (16-bit)
5. Multiplication (8 - bit)
6. Division (8 – bit)
7. Ascending order.
8. Descending order.
9. Largest number in the given array.
10. Smallest number in the given array.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	3	3	2	1	-	-	1	3	3	2	3
CO2	3	2	2	2	2	3	3	-	-	2	2	2	2	3
CO3	3	3	3	3	3	2	2	-	-	2	2	2	2	2
CO4	2	2	2	2	2	2	3	-	-	1	3	3	2	3
Avg.														

	P. R. College (Autonomous), Kakinada	**Program & Semester** II B.Sc. Electronics (IV Semester) Paper - V			
Course Code **EL5205**	**TITLE OF THE COURSE** **Microcontroller and Interfacing**				
Teaching	Hours Allocated: 60 (**Theory**)	L	T	P	C
Pre-requisites	Microprocessor basics	4	-	-	4

Course Objectives:

1. To understand the concepts of microcontroller based system.
2. To enable design and programming of microcontroller based system.
3. To know about the interfacing Circuits.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Understand the architecture of 8051 microcontroller.
CO2	Understand the key concepts of 8051 microcontroller systems like I/O operations, Interrupts, programming of timers and counters.
CO3	Understand Interfacing of 8051 Microcontroller with peripherals.
CO4	Write & execute 8051 microcontroller programs to perform various experiments

Course with focus on employability / entrepreneurship / Skill Development modules

Skill Development		**Employability**		**Entrepreneurship**	

SYLLABUS

Module-I: (10 Hrs.)
Introduction to microcontrollers:
Introduction to microcontrollers, comparison of Microprocessor and micro controller, ***Harvard & Von Neumann architecture, differences between RISC & CISC microcontrollers,*** 8-bit and 16- bit Microcontrollers, Development tools for micro controllers – Editor, Assembler, Compiler, Simulator, Debugger & Emulator.

Module -II: (15 Hrs.)
Microcontroller Architecture:
Overview and block diagram of 8051, ***Features of 8051***, Architecture of 8051, program counter and memory organization, Data types and directives, PSW register, Register banks and stack, pin diagram of 8051, Interrupts and timers.

Module-III:(12 Hrs.)
Addressing modes, instruction set of 8051:
Addressing modes and accessing memory using various addressing modes, instruction set: Arithmetic, Logical, Simple bit, jump, loop and call instructions and their usage. Timer/Counter Programming.

Module -IV: (10 Hrs.)
Assembly language programming:
Addition, Multiplication, Subtraction, division, arranging a given set of numbers in largest/smallest order (All 8-bit data).

Module-V : (13 Hrs.)
Interfacing and Application of Microcontroller:
Basics of serial communication, 8255 PPI, Interfacing of – PPI 8255 with 8051, interfacing seven segment displays, displaying information on an LCD, control of a stepper Motor (Uni-Polar).

Note: Topics in Bold & Italic are added to the syllabus.

Text books:

1. The 8051 microcontroller and embedded systems using assembly and c-kennet j. Ayalam, Dhananjay V. gadre, cengage publishers
2. The 8051 microcontrollers and Embedded systems - By Muhammad Ali Mazidi and Janice Gillespie Mazidi – Pearson Education Asia, 4th Reprint, 2002.

REFERENCES:

1. Microcontrollers Architecture Programming, Interfacing and System Design – **Raj Kamal.**
2. The 8051 Microcontroller Architecture, Programming and Application - **Kenneth J. Ajala ,** west publishing company (ST PAUL, NEW YORK, LOS ANGELES, SAN FRANCISCO).
3. Microcontroller theory and application-Ajay V. Deshmukh

Web Links:

1.
2.

Activities proposed

Measurable:

1. Assignments on Harvard & Von Neumann architecture, RISC & CISC microcontroller, development tools for microcontrollers, architecture of 8051, registers in 8051, data types and directives, pin diagram of 8051, interrupts in 8051, addressing modes of 8051, timers in 8051, assembly language programs, 8255 PPI, interfacing of 8051 with 8255.
2. Student seminars (Individual presentation of papers) on topics relating to different types of microcontrollers (4-bit, 8-bit, 16-bit & 32-bit), Development tools for microcontrollers (Editor, Assembler, Compiler, Simulator, Debugger & Emulator), Block diagram of 8051, Special function registers, accessing memory using various addressing modes, mode operations in 8051, interfacing of 8051 with peripheral device.
3. Quiz Programmes on architecture, instruction set, special function registers, timer modes in 8051, instruction set.
4. Individual Field Studies/projects on interfacing of steeper motor to 8051.
5. Group discussion on programs.
6. Group/Team Projects on interfacing a peripheral device to 8051.

General:

7. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
8. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
9. Any similar activities with imaginative thinking.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	3	3	3	1	-	-	1	3	3	1	3
CO2	3	2	3	3	2	3	3	1	-	3	2	3	2	3
CO3	3	3	3	3	2	2	2	1	1	3	3	3	2	2
CO4	3	2	2	2	2	2	3	-	1	1	3	3	2	3
Avg.														

Topics Included / Deleted under Autonomous setup

Program : II B.Sc.
Semester : IV
Course : V Electronics
Title of the course : Microcontroller & Interfacing.

S. No.	Name of the Module	Topics Added	Justification
1	Module I	Harvard & Von Neumann architecture. Differences between RISC & CISC microcontrollers	➢ Gives idea about various architectures. ➢ Gives idea about technology that is used in various microcontrollers.
2	Module II	Features of 8051	➢ Gives clarity about 8051.
3	Module V	Basics of serial communication.	➢ Gives idea about different types of communication.

Total Percentage of addition: 20 %

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. II Year - Electronics – Semester – 4
PAPER – 5 [Code: EL5205]
w.e.f. 2020-21 ADMITTED BATCH
Micro Controller and Interfacing

4 Hours/Week [Total: 60 hrs.] **Credits: 04**

MODEL QUESTION PAPER

Note: - Set the question paper as per the blue print given.

Time: 2 Hrs. **Max.Marks:50**

Section	Questions to be given	Questions to be answered	Marks
A	6	3	3 x 10M = 30M
B	7	4	4 x 5 M = 20M
Total	13	7	50M

Blue Print

Module Name	Essay Questions [10 marks]	Short Questions [5 marks]	Programs [5 marks]	Marks allotted
Introduction to microcontrollers	1	2	-	20
Microcontroller architecture	2	1	-	25
Addressing modes, instruction set of 8051	1	1	-	15
Assembly Language programming	1 (Program)	-	2	20
Interfacing & application of microcontroller	1	1	-	15
Total Marks				95

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. II Year - Electronics – Semester – 4
PAPER – 5 [Code: EL5205]
w.e.f. 2020-21 ADMITTED BATCH

Micro Controller and Interfacing

MODEL QUESTION PAPER

Time: 2 hrs. **Max Marks: 50M**

Section - A

Answer any Three questions by choosing at least one question from each part

3 X 10 = 30 M

Part – A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 2

Part – B

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section – B

Answer any Four questions **4 X 5 = 20 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 1
9. Short answer question from Module - 2
10. Short answer question from Module - 3
11. Short answer question from Module - 5
12. Program from Module – 4
13. Program from Module – 4

QUESTION BANK

MICRO CONTROLLER AND INTERFACING

Module-I:

ESSAY QUESTIONS

1. Differentiate Harvard and von-Neumann architectures.
2. Distinguish RISC & CISC Microcontrollers.

SHORT QUESTIONS

3. Discriminate microprocessor and micro controller.
4. Explain 8-bit and 16-bit microcontrollers in detail.
5. Describe compiler and debugger in 8051.
6. Explain Editor & Assembler in 8051.
7. Explain Emulator & Simulator in in 8051.

Module-II:

ESSAY QUESTIONS

8. Plot the pin diagram of 8051 and explain each pin.
9. Sketch the block diagram of 8051 and explain each block.
10. Explain program counter and memory organization in 8051.

SHORT QUESTIONS

11. Discuss stack organization of 8051
12. Write a note on data types & directives in 8051.
13. Explain in detail PSW register in 8051.
14. Explain about interrupts in 8051.
15. Discuss special function registers (SFR) in 8051.

Module-III:

ESSAY QUESTIONS

16. List out different Addressing modes present in 8051 and explain them?
17. Describe timer register. Explain TMOD register in 8051 and Mode0 operation.
18. Describe timer register. Explain TMOD register in 8051 and Mode1 operation.
19. Describe timer register. Explain TMOD register in 8051 and Mode2 operation.

SHORT QUESTIONS

20. Explain how to access the memory using various addressing modes?
21. Give a note on Branch (jump, loop and call) group of instructions.
22. Explain Arithmetic group of instructions.
23. Give a note on Logical group of instructions.
24. Explain Counter Programming in 8051?

Module-IV:

ESSAY QUESTIONS

25. Write an ALP to add two 8-bit numbers.
26. Write an ALP to subtract two 8-bit numbers.
27. Write an ALP to multiply two 8-bit numbers.

SHORT QUESTIONS

28. Write an ALP for arranging four 8-bit numbers in descending order.
29. Write an ALP for arranging four 8-bit numbers in ascending order.
30. Write an ALP to divide two 8-bit numbers.

Module-V:

ESSAY QUESTIONS

31. Draw and explain block diagram of 8255?
32. Develop a program for the ADC to connect PPI 8255?
33. Explain briefly about I/O modes of 8255?
34. Explain interfacing of seven segment displays?

SHORT QUESTIONS

35. Describe control word bits of 8255
36. Find the control byte for PA = IN, PB = OUT and PC = OUT
37. Plot a pin diagram of PPI 8255?
38. Discuss control of stepper motor.
39. Write a short note on serial communication.

	P. R. College (Autonomous), Kakinada	Program & Semester: II B.Sc. Electronics (IV Semester) Paper - V			
Course Code **EL5205P**	**TITLE OF THE COURSE** **Microcontroller and Interface**				
Demonstration	Hours Allocated: 30 (Practical)	L	T	P	C
Pre-requisites	Hex codes for 8051	-	-	2	1

Course Objectives:

1. To understand techniques for faster execution of instructions and improve speed of operation and performance of microcontrollers.
2. To understand the execution of programs by using simulator.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Learnt about microcontroller instruction set and its usage
CO2	Learnt about algorithm and flow chart preparation for better understanding of program writing.
CO3	Learnt about techniques for faster execution of instructions to improve the speed of operation and performance.
CO4	Learnt about interfacing of different peripherals and to observe its operation.

Course with focus on employability / entrepreneurship / Skill Development modules

Any **Five** experiments should be done

1. Addition (8 – Bit)
2. Subtraction (8 – bit)
3. Multiplication (8 - bit)
4. Division (8 – bit)
5. Ascending order (8 – bit)
6. Descending order (8 – bit)
7. Largest number in the given array (8 – bit)
8. Smallest number in the given array (8 – bit)

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	3	3	3	1	-	-	1	3	3	2	3
CO2	3	2	2	3	2	2	3	-	-	3	2	3	2	3
CO3	3	3	3	3	2	2	2	-	-	3	3	2	2	2
CO4	3	2	2	2	2	2	3	-	-	1	3	3	2	3
Avg.														

	P. R. College (Autonomous), Kakinada	**Program & Semester** III B.Sc. Electronics (V Semester) Paper – VI A			
Course Code **EL6205A**	**TITLE OF THE COURSE Industrial Electronics**				
Teaching	Hours Allocated: 60 (**Theory**)	L	T	P	C
Pre-requisites		4	-	-	4

Course Objectives:

1. To understand the concepts of rectifiers, filters, power supplies & multipliers.
2. To identify various lab electrical instruments and their working.
3. To understand the properties and applications of different materials like resistor, inductor, capacitor.
4. To study the heating effects and dielectric properties of the materials.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Identify various facilities required to set up a basic Instrumentation Laboratory.
CO2	Acquire a critical knowledge of various Electrical Instruments used in the Laboratory.
CO3	Demonstrate skills in using instruments like Rectifiers, Multimeters, Power supplies, Voltage Regulators etc. through hands-on experience.
CO4	Understand the Principle and operation of different Electronic Heating devices.

Course with focus on employability / entrepreneurship / Skill Development modules

Skill Development		**Employability**		**Entrepreneurship**	

SYLLABUS

Module - I (20 hours)

Rectifiers and filters:

Rectifiers– Half wave, full-wave and bridge rectifiers- Efficiency- Ripple factor- Regulation – Harmonic components in rectified output – Types of filters- Choke input (inductor) filter- Shunt capacitor filter- L section and π section filters.

Voltage Regulators: Transistor Series voltage regulator - Transistor Shunt voltage regulator – Three terminal regulators (78XX and 79XX).

Module - II (10 hours)
Power Supplies:
Block diagram of regulated power supply – A simple regulated transistorized power supply (circuit and working) – Principle and working of switch mode power supply (SMPS).

MODULE-III (10 hours)
Voltage Multipliers:
Half wave voltage doubler, Full wave voltage doubler, Voltage Tripler circuit diagram and working mentioning of applications of voltage multipliers.

MODULE-IV (10 hours)
Controlled rectifiers:
SCR Half wave rectifier circuit, working with wave forms, mathematical analysis for resistive load - SCR Full wave rectifier circuit, working with wave forms, mathematical analysis for resistive load – SCR as inverter parallel and series circuits.

MODULE-V (10 hours)
Heat effects:
Resistance, inductance and dielectric heating. Principle of operations and its applications. Dielectric Properties: Introduction, effect of a dielectric on the behavior of a capacitor, dielectric losses, significance of the loss tangent.

Text books:

1. Unified Electronics Volume II by J.P Agarwal and Amit Agarwal.
2. Industrial Electronics, S.B. Biswas, Dhanapur Rai & Sons.
3. Industrial Electronics, G.K. Mithal, Khanna Publishers.
4. Electronic Devices and Circuits – G.K. Mithal.
5. Electronic Devices and Circuits-Millman and Halkias- Tata Mc Graw Hill (TMH)
6. Microelectronics- J. Millman and A. Grabel - TMH

Web Links:

1.
2.

Activities proposed

Measurable:

1. Assignments on Half wave rectifier, Full wave rectifier, bridge rectifier, L-section & π section filters, Transistor as series voltage regulator & shunt voltage regulator, three terminal voltage regulators, SMPS, Voltage doubler and Tripler working, SCR as Half & Full wave rectifiers, dielectric properties.
2. Student seminars (Individual presentation of papers) on topics relating to Rectifiers, filters, power supplies, three terminal IC voltage regulators, regulated power supply, SMPS, Voltage multipliers, SCR, SCR applications, heating effects of different materials.
3. Quiz Programmes on Rectifiers, filters, power supplies, voltage regulators, Voltage multipliers, SCR and heating effects.
4. Individual Field Studies/projects on three terminal IC voltage regulators, SCR as inverter.
5. Group discussion on Rectifiers and its types, power supplies, SCR.
6. Group/Team Projects on Designing SMPS.

General:

7. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
8. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
9. Any similar activities with imaginative thinking.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	3	3	3	1	-	-	1	3	3	2	3
CO2	3	2	2	2	2	3	3	1	1	3	2	3	2	2
CO3	3	3	3	3	3	2	3	1	-	2	3	2	2	2
CO4	3	3	2	2	2	2	2	-	1	1	3	3	2	3
Avg.														

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – V
w.e.f. 2020-21 ADMITTED BATCH
PAPER – 6 A [General Elective EL6205A]

INDUSTRIAL ELECTRONICS

4 Hours/Week [Total: 60 hrs.] **Credits: 04**

MODEL QUESTION PAPER

Note: - Set the question paper as per the blue print given.

Time: $2\frac{1}{2}$Hrs. **Max. Marks: 60**

Section	Questions to be given	Questions to be answered	Marks
A	6	3	3 x 10M = 30M
B	12	6	6 x 5 M = 30M
Total	18	9	60M

Blue Print

Module Name	Essay Questions [10 marks]	Short Questions [5 marks]	Marks allotted
Rectifiers and filters Voltage Regulators	2	3	35
Power Supplies	1	3	25
Voltage Multipliers	1	2	20
Controlled rectifiers	1	2	20
Heat effects	1	2	20
Total Marks			120

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – V
w.e.f. 2020-21 ADMITTED BATCH
PAPER – 6 A [General Elective EL6205A]

INDUSTRIAL ELECTRONICS

MODEL QUESTION PAPER

Time: 2 ½ hrs. **Max Marks: 60M**

Section - A

Answer any Three questions by choosing at least one question from each part

3 X 10 = 30 M

Part – A

1. Essay question from Module – 1
2. Essay question from Module – 1
3. Essay question from Module – 2

Part – B

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section – B

Answer any Four questions **6 X 5 = 30 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 1
9. Short answer question from Module - 1
10. Short answer question from Module - 2
11. Short answer question from Module - 2
12. Short answer question from Module - 2
13. Short answer question from Module - 3
14. Short answer question from Module - 3
15. Short answer question from Module - 4
16. Short answer question from Module - 4
17. Short answer question from Module - 5
18. Short answer question from Module - 5

	P. R. College (Autonomous), Kakinada	Program & Semester: III B.Sc. Electronics (V Semester) Paper – VI A			
Course Code **EL6205AP**	**TITLE OF THE COURSE** **Industrial Electronics**				
Demonstration	Hours Allocated: 30 (Practical)	L	T	P	C
Pre-requisites	Theoretical knowledge on power supplies, filters, regulators & SCR	-	-	2	1

Course Objectives:

1. To understand the concepts of rectifiers, filters, power supplies & multipliers.
2. To identify various lab electrical instruments and their working.
3. To understand the properties and applications of different materials like resistor, inductor, capacitor.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Construction of DC power supply and filters
CO2	Identify the differences of shunt & series regulated power supplies.
CO3	Construction of different IC voltage regulators
CO4	Studied the characteristics and applications of SCR

Course with focus on employability / entrepreneurship / Skill Development modules

Any **Five** experiments should be done

1. D.C Power supply and filters.
2. Transistor series regulator
3. Transistor as a shunt regulator
4. Voltage regulator using IC-7805and IC-7905.
5. Voltage doubler using diodes
6. Voltage Tripler using diodes
7. SCR VI characteristics.
8. SCR Series inverter
9. SCR parallel inverter.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	3	3	3	2	-	-	1	3	3	2	3
CO2	3	2	2	2	2	3	3	-	-	3	2	2	2	2
CO3	2	3	2	3	2	2	2	1	-	3	3	2	2	2
CO4	3	2	2	2	3	2	3	-	-	2	3	3	3	3
Avg.														

	P. R. College (Autonomous), Kakinada	**Program & Semester** III B.Sc. Electronics (V Semester) Paper – VII A			
Course Code **EL7205A**	**TITLE OF THE COURSE** **Electronic Instrumentation**				
Teaching	Hours Allocated: 60 (**Theory**)	L	T	P	C
Pre-requisites	Basics of CRO, Function generator, Multimeter	4	-	-	4

Course Objectives:

1. To Identify various facilities required to set up a basic Instrumentation Laboratory.
2. To identify various lab electrical instruments and their working.
3. To Understand the Principle and operation of different display devices used in the display systems and different transducers.
4. To study the applications of various biomedical instruments in daily life like B.P. meter, ECG, Pulse oximeter etc. and know the handling procedures with safety and security.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Acquire a critical knowledge of various Electrical Instruments used in the Laboratory.
CO2	Demonstrate skills of using instruments like CRO, Function Generator, Multimeter etc. through hands on experience.
CO3	Understand the Principle and operation of different display devices used in the display systems and different transducers
CO4	Comprehend the applications of various biomedical instruments in daily life like B.P. meter, ECG, Pulse oximeter etc. and know the handling procedures with safety and security.

Course with focus on employability / entrepreneurship / Skill Development modules

Skill Development		**Employability**		**Entrepreneurship**	

SYLLABUS

Module-I (12 hrs.)

Introduction to Instruments: Types of electronic Instruments - Analog instruments & Digital Instruments, DC Voltmeter and AC Voltmeter, Construction and working of an Analog Multimeter and Digital Multimeter (Block diagram approach), Sensitivity,

3½display and 4½ display Digital multimeters, Basic ideas on Function generator. Block Diagram of Function Generator.

Module-II (12 hrs.)

Oscilloscope: Cathode Ray Oscilloscope-Introduction, Block diagram of basic CRO, Cathode ray tube, Electron gun assembly, Screen for CRT, Time base operation, Vertical deflection system, Horizontal deflection system, Use of CRO for the measurement of voltage (AC and DC), frequency, phase difference, Different types of oscilloscopes and uses.

Module-III (12 hrs.)

Transducers: Classification of transducers, Selection of transducers, Resistive, capacitive & inductive transducers, Resistive and capacitive touch screen transducer used in mobiles, Displacement transducer-LVDT, Piezoelectric transducer, Photo transducer, Digital transducer, Fiber optic sensors

OVERVIEW OF OPTICAL FIBER COMMUNICATION: Introduction, Historical development, general system, advantages, disadvantages, and applications of optical fiber communication

Module-IV (12 hrs.)

Display Instruments: Introduction to Display devices, Seven Segment Displays, LED Displays, Construction and operation (Display of numbers),Types of SSDs (Common Anode & Common Cathode type), Limitations of SSDs, Liquid Crystal Displays, Applications of LCD modules.

Module-V (12 hrs.)

Biomedical Instruments: Basic operating principles and uses of (i) Clinical thermometer (ii) Stethoscope (iii) Sphygmomanometer (iv) ECG machine (v) Radiography (vi) Ophthalmoscope (vii) Ultrasound scanning (viii) Pulse oximeter (ix) Glucometer, Basic ideas of CT scan and MRI scan.

Text books:

1. Electronic Instrumentation by H.S.Kalsi , TMH Publishers
2. Electronic Instrument Hand Book by Clyde F. Coombs , McGraw Hill
3. Introduction to Biomedical Instrumentation by Mandeep Singh, PHI Learning.
4. Biomedical Instrumentation and Measurements by Leslie Cromwell , Prentice Hall India.
5. Electronic Measurements and Instrumentation by Kishor, K Lal, Pearson, New Delhi
6. Electrical and Electronic Measurements by Sahan, A.K., Dhanpat Rai, New Delhi
7. Electronic Instruments and Measurement Techniques by Cooper, W.D.

Halfrick, A.B., PHI Learning, New Delhi

8. Web sources suggested by the teacher concerned and the college librarian including reading material.

Web Links:

1.
2.

Activities proposed

Measurable:

1. Assignments on Electronic instruments, AC & DC voltmeter, Analog & Digital multimeter, Block diagram of CRO, Transducers & its types, fiber optic communication, seven segment displays, LED displays operational techniques with safety and security.
2. Student seminars (Individual presentation of papers) on topics Electronic instruments, DC & AC voltmeters, Analog & Digital electronics, Function generator, CRO & its working, Measurement of various attributes using CRO, applications of Transducers, Advantages, disadvantages & applications of fiber optic communication, Seven segment displays, LED displays, Types of SSDs, applications of LCDs.
3. Quiz Programmes on Electronic instruments, voltmeters, multimeters, transducers, CRO, optical fiber communication, display instruments.
4. Individual Field Studies/projects on stethoscope, seven-segment display.
5. Group discussion on applications of electronic instruments, applications of multimeters, applications of transducers, display instruments.
6. Group/Team Projects on designing a digital multimeter.
7. Preparation of videos on tools and techniques in various branches of instrumentation.
8. Collection of material/figures/photos related to products of Measuring Instruments, Display Modules and Biomedical Instruments and arrange them in a systematic way in a file.
9. Visits to Instrumentation Laboratories of local Universities or Industries like Cement, Chemical or Sugar Plants etc. or any nearby research organizations, private firms, etc.
10. Invited lectures and presentations on related topics by Technical /industrial experts.

General:

11. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
12. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
13. Any similar activities with imaginative thinking.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	3	3	3	1	1	-	1	3	3	1	3
CO2	3	3	3	2	2	3	3	1	-	2	2	2	2	2
CO3	2	3	3	3	3	2	2	1	1	3	3	3	2	2
CO4	3	2	3	2	2	3	3	-	1	1	2	3	3	3
Avg.														

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – V
w.e.f. 2020 - 21 ADMITTED BATCH
PAPER – 7 A [General Elective EL7205A]

ELECTRONIC INSTRUMENTATION

4 Hours/Week [Total: 60 hrs.] **Credits: 03**

MODEL QUESTION PAPER

Note: - Set the question paper as per the blue print given.

Time: $2\frac{1}{2}$Hrs. **Max. Marks: 60**

Section	Questions to be given	Questions to be answered	Marks
A	6	3	3 x 10M = 30M
B	12	6	6 x 5 M = 30M
Total	18	9	60M

Blue Print

Module Name	Essay Questions [10 marks]	Short Questions [5 marks]	Marks allotted
Introduction to Instruments	1	3	35
Oscilloscope	2	2	25
Transducers	1	2	20
Display Instruments	1	3	20
Biomedical Instruments	1	2	20
Total Marks			120

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – V
w.e.f. 2020 - 21 ADMITTED BATCH
PAPER – 7 A [General Elective EL7205A]

ELECTRONIC INSTRUMENTATION

MODEL QUESTION PAPER

Time: 2 ½ hrs. **Max Marks: 60M**

Section - A

Answer any Three questions by choosing at least one question from each part

3 X 10 = 30 M

Part – A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 2

Part – B

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section – B

Answer any Four questions **6 X 5 = 30 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 1
9. Short answer question from Module - 1
10. Short answer question from Module - 2
11. Short answer question from Module - 2
12. Short answer question from Module - 3
13. Short answer question from Module - 3
14. Short answer question from Module - 4
15. Short answer question from Module - 4
16. Short answer question from Module - 4
17. Short answer question from Module - 5
18. Short answer question from Module - 5

	P. R. College (Autonomous), Kakinada	Program & Semester: III B.Sc. Electronics (V Semester) Paper – VII A			
Course Code **EL7205AP**	**TITLE OF THE COURSE** **Electronic Instrumentation**				
Demonstration	Hours Allocated: 30 (Practical)	L	T	P	C
Pre-requisites	Theoretical knowledge on multimeters, CRO, seven segment displays	-	-	2	1

Course Objectives:

1. List out, identify and handle various equipment in Instrumentation Laboratory or Electronic Laboratory.
2. To identify various lab electrical instruments and their working.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Learn the construction, operational principles of various instruments.
CO2	Demonstrate skills in handling, Maintenance & troubleshooting of different instruments used in the Labs.
CO3	Acquire skills in observing and measuring various electrical and electronic quantities.
CO4	Perform some techniques related to Biomedical Instrumentation and measurement of Certain physiological parameters like body temperature, B.P. and sugar levels etc.

Course with focus on employability / entrepreneurship / Skill Development modules

Any **Five** experiments should be done

1. Familiarization of digital multimeter and its usage in the measurements of (i) resistance, (ii) current, (iii) AC & DC voltages and for (i) continuity test (ii)diode test and (iii) transistor test.
2. Measure the AC and DC voltages, frequency using a CRO and compare the values Measured with other instruments like Digital Multimeter.
3. Formation of Sine, Square wave signals on the CRO using Function Generator and measure their frequencies. Compare the measured values with actual values.
4. Display the numbers from 0 to 9 on a single Seven Segment Display module by Applying voltages.
5. Display the letters **a** to **h** on a single Seven Segment Display module by applying voltages.
6. Measurement of body temperature using a digital thermometer and list out the error

and corrections.

7. Measurement of Blood Pressure of a person using a B.P. meter and record the values and analyze them.
8. Get acquainted with an available ECG machine and study the ECG pattern to understand the meaning of various peaks

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	2	2	3	3	3	1	-	-	1	3	3	2	2
CO2	3	2	3	2	2	2	2	-	-	2	2	2	2	2
CO3	3	3	3	3	3	2	2	-	-	2	3	2	1	2
CO4	2	2	2	2	2	2	2	-	-	1	3	3	2	3
Avg.														

	P. R. College (Autonomous), Kakinada	**Program & Semester** III B.Sc. Electronics (V Semester) Paper – VI B			
Course Code **EL6205B**	**TITLE OF THE COURSE Embedded Systems Design**				
Teaching	Hours Allocated: 60 (**Theory**)	L	T	P	C
Pre-requisites		4	-	-	4

Course Objectives:

1. Design embedded computer system hardware.
2. Design, implement, and debug multi-threaded application software that operates under real-time constraints on embedded computer systems.
3. Use and describe the implementation of a real-time operating system on an embedded computer system.
4. Formulate an embedded computer system design problem including multiple constraints, create a design that satisfies the constraints, implement the design in hardware and software, and measure performance against the design constraints.
5. Create computer software and hardware implementations that operate according to well-known standards.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	The student can gain good knowledge on Embedded Systems and implement in practical applications.
CO2	To study advanced communication principles.
CO3	An ability effectively as a member or leader on a technical team.
CO4	A commitment to quality, timeliness and continuous improvement.

Course with focus on employability / entrepreneurship / Skill Development modules

Skill Development		**Employability**		**Entrepreneurship**	

SYLLABUS

MODULE - 1: (10 Hrs.)
Introduction to Embedded Systems:

Embedded systems overview, Design Challenge, Processor Technology, IC Technology, and Design Technology.

MODULE - 2: (15 Hrs.)
Custom Single Purpose Processor – Hardware Development:

Introduction, Combinational logic, Sequential logic, Custom Single Purpose Processor Design, RT-Level Custom Single-Purpose Processor.

MODULE - 3: (15 Hrs.)
General Purpose Processor – Software Development:

Introduction, Basic Architecture, Operation, Programmer's View, ASIPs, and Development Environment: Host and Target Machines, Linker / Locators for Embedded Software, Getting Embedded Software into the target system. Debugging Techniques: Testing on your Host Machine, and Instruction Set Simulators.

MODULE - 4: (10 Hrs.)
RTWA for Embedded Systems:

Introduction, Timers, Counters and Watchdog Timers, UART, Pulse Width Modulators, Stepper Motor Controllers, Analog – to – Digital Converters, and Real Time Clocks.

MODULE -5: (10 Hrs.)
Advanced Communication Principles:

Parallel Communication, Serial Communication, Wireless Communication, **Serial Protocols**: I^2C, CAN, FireWire, and USB. **Parallel Protocols**: PCI BUS and ARM BUS. **Wireless Protocols**: IrDA, Bluetooth, and IEEE 802.11.

Text books:

1. Embedded System Design – A Unified Hardware / Software Introduction By **Frank Vahid / Tony Givargis** – WILEY EDITION.
2. Embedded Systems Architecture, Programming and Design – 2nd Edition By **Raj Kamal** – Tata McGraw-Hill Education.

Reference books:

1. An Embedded Software Premier - **David E- Siman**, PEARSON Education
2. Education Embedded / real - time systems - **DR. K.V.K.K. Prasad**, dreamtech
3. The art of programming Embedded systems, **Jack G. Ganssle**, academic press
4. Intelligent Embedded systems, **Louis L. Odette, Adison Wesley**, 1991

Web Links:

1.
2.

Activities proposed

Measurable:

1. Assignments on processor technology, IC technology, design technology, RT-Level custom single purpose processor, ASIP, Embedded software, debugging techniques, Instruction set of simulators, Timers, counters, stepper motor controllers, A/D converters, Real time clocks, Firewire, USB, Bluetooth, IEEE 802.11.
2. Student seminars (Individual presentation of papers) on topics relating Processor technology, IC technology, Design technology, hardware development of single purpose processor, software development of processor, RTWA for embedded systems, serial communication & parallel communication, wireless protocols.
3. Quiz Programmes on Processor technology, IC technology, Design technology, hardware development of single purpose processor, software development of processor, RTWA for embedded systems, serial communication & parallel communication, wireless protocols.
4. Individual Field Studies/projects on wireless protocols.
5. Group discussion on advanced communication principles.
6. Group/Team Projects on design a gadget using wireless protocols like Bluetooth.

General:

7. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
8. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
9. Any similar activities with imaginative thinking.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	3	3	3	1	-	-	1	3	3	1	3
CO2	3	2	3	2	2	2	3	1	1	3	2	2	2	2
CO3	2	3	2	3	3	2	2	1	1	2	2	3	2	2
CO4	3	3	2	2	2	2	2	-	1	1	3	3	3	3
Avg.														

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – V
w.e.f. 2020-21 ADMITTED BATCH
PAPER – 6 B [General Elective EL6205B]

EMBEDDED SYSTEMS DESIGN

4 Hours/Week [Total: 60 hrs.] **Credits: 04**

MODEL QUESTION PAPER

Note: - Set the question paper as per the blue print given.

Time: $2\frac{1}{2}$Hrs. **Max. Marks: 60**

Section	Questions to be given	Questions to be answered	Marks
A	6	3	3 x 10M = 30M
B	12	6	6 x 5 M = 30M
Total	18	9	60M

Blue Print

Module Name	Essay Questions [10 marks]	Short Questions [5 marks]	Marks allotted
Introduction to Embedded Systems	1	2	20
Custom Single Purpose Processor – Hardware Development	1	3	25
General Purpose Processor – Software Development	2	3	35
RTWA for Embedded Systems	1	2	20
Advanced Communication Principles	1	2	20
Total Marks			120

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – V
w.e.f. 2020-21 ADMITTED BATCH
PAPER – 6 B [General Elective EL6205B]
EMBEDDED SYSTEMS DESIGN

MODEL QUESTION PAPER

Time: 2 ½ hrs. **Max Marks: 60M**

Section - A

Answer any Three questions by choosing at least one question from each part

3 X 10 = 30 M

Part – A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 3

Part – B

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section – B

Answer any Six questions **6 X 5 = 30 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 1
9. Short answer question from Module - 2
10. Short answer question from Module - 2
11. Short answer question from Module - 2
12. Short answer question from Module - 3
13. Short answer question from Module - 3
14. Short answer question from Module - 3
15. Short answer question from Module - 4
16. Short answer question from Module - 4
17. Short answer question from Module - 5
18. Short answer question from Module - 5

PAPER – 6 B [General Elective EL6205B]
EMBEDDED SYSTEMS DESIGN
QUESTION BANK

MODULE - I: Introduction to Embedded Systems
ESSAY QUESTIONS

1. Explain Embedded systems overview and Design Challenge, Processor Technology,
2. Explain IC Technology and Design Technology.

SHORT ANSWER QUESTIONS

3. Describe processor Technology.
4. Discuss IC Technology and Design Technology.

MODULE - II: Custom Single Purpose Processor – Hardware Development
ESSAY QUESTIONS

5. Explain Custom Single Purpose Processor Design
6. Evaluate RT-Level custom single-purpose processor.

SHORT ANSWER QUESTIONS

7. Describe Combinational Logic.
8. Explain Sequential Logic.

MODULE - III: General Purpose Processor – Software Development
ESSAY QUESTIONS

9. Explain Linker / Locators for Embedded Software.
10. Give basic architecture of processor and explain its operation.
11. How can you get Embedded Software into the target system.

SHORT ANSWER QUESTIONS

12. Describe Host and Target Machines.
13. Explain Programmer 's View.
14. Explain ASIPs.

MODULE - IV: RTWA for Embedded Systems
ESSAY QUESTIONS

15. Describe Analog – to – Digital Converters.
16. Explain Real Time Clocks.

SHORT ANSWER QUESTIONS

17. Discuss Pulse Width Modulators.
18. Describe Timers, counters.
19. Explain UART, Watchdog Timers.
20. Explain Stepper Motor Controllers.

MODULE - V: Advanced Communication Principles

ESSAY QUESTIONS

21. Explain communication? Explain Parallel Communication.
22. Define communication? Explain Serial Communication.
23. Describe communication and Explain Wireless communication.

SHORT ANSWER QUESTIONS

24. Describe protocol, explain Serial protocol of CAN.
25. Describe protocol, explain Serial protocol of USB.
26. Describe protocol, explain Parallel protocol PCI BUS.
27. Describe protocol, explain Parallel protocol ARM BUS.
28. Describe protocol, explain serial protocol of I2C.
29. Describe protocol, explain serial protocol of FireWire
30. Discuss wireless protocol. Explain any one of them.
31. Describe Bluetooth.
32. Explain IEEE 802.11. & IrDA.

	P. R. College (Autonomous), Kakinada	Program & Semester: III B.Sc. Electronics (V Semester) Paper – VI B			
Course Code **EL6205BP**	**TITLE OF THE COURSE** **Embedded systems design**				
Demonstration	Hours Allocated: 30 (Practical)	L	T	P	C
Pre-requisites		-	-	2	1

Course Objectives:

1. To develop programs for different applications.
2. To Interface 8051 with D/A & A/D converter and generate different types of wave forms.
3. To generate traffic signals using embedded systems.
4. To control temperature by using embedded systems.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Develop a program to generate time delay.
CO2	Interfacing of 8051 with D/A converter and generate different types of wave forms .
CO3	Interfacing of 8051 with stepper motor and controlling of clock angle.
CO4	Generate traffic signals.

Course with focus on employability / entrepreneurship / Skill Development modules

Any **Five** experiments should be done

1. Configure timer control registers of 8051 and develop a program to generate given time delay.
2. Port I/O: Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's.
3. Serial I/O: Configure 8051 serial port for asynchronous serial communication with serial port of PC exchange text messages to PC and display on PC screen. Signify end of message by carriage return.
4. Interface 8051 with D/A converter and generate square wave of given frequency on oscilloscope.
5. Interface 8051 with D/A converter and generate triangular wave of given frequency on oscilloscope.
6. Using D/A converter generate sine wave on oscilloscope with the help of lookup table stored in data area of 8051.

7. Interface Stepper motor with 8051 and write a program to move the motor through a given angle in clock wise or counter clock wise direction.
8. Generate traffic signal.
9. Temperature controller.
10. Elevator control.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	3	3	3	1	-	-	1	3	3	2	3
CO2	3	2	2	2	2	2	3	-	-	2	2	2	2	2
CO3	2	3	3	3	2	2	2	-	-	3	3	2	2	2
CO4	3	2	2	2	3	2	3	-	-	1	2	3	2	3
Avg.														

	P. R. College (Autonomous), Kakinada	**Program & Semester** III B.Sc. Electronics (V Semester) Paper – VII B			
Course Code **EL7205B**	**TITLE OF THE COURSE Consumer Electronics**				
Teaching	Hours Allocated: 60 (**Theory**)	L	T	P	C
Pre-requisites		4	-	-	4

Course Objectives:

1. To study Microwave ovens – block diagram - working - types – wiring and safety instructions. – care and cleaning.
2. To study washing machines – block diagram - working - types – wiring and safety instructions. – care and cleaning.
3. To study Air conditioners and refrigerators – block diagram - working - types – wiring and safety instructions. – care and cleaning.
4. To study Home/Office digital devices – block diagram - working - types – wiring and safety instructions. – care and cleaning.
5. To study Digital access devices like – block diagram - working - types – wiring and safety instructions. – care and cleaning.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	The student can gain a good knowledge of microwave ovens and implement them in practical applications.
CO2	The student can gain a good knowledge of Washing Machines and implement in practical applications.
CO3	The student can gain a good knowledge of Air conditioners and Refrigerators and implement them in practical applications.
CO4	The student can gain a good knowledge of Digital access devices and implement in practical applications.

Course with focus on employability / entrepreneurship / Skill Development modules

Skill Development		**Employability**		**Entrepreneurship**	

SYLLABUS

Module – I (12 hrs.):

Microwave Ovens: Microwaves (Range used in Microwave ovens) – Microwave oven block diagram – LCD timer with alarm – Single-Chip Controllers – types of Microwave oven – Wiring and Safety instructions – care and Cleaning.

Module - II (12 hrs.):

Washing Machines: Electronic controller for washing machines – Washing machine hardware and software – Types of washing machines – Fuzzy logic washing machines Features of washing machines.

Module – III (12 hrs.):

Air Conditioners and Refrigerators: Air Conditioning – Components of air conditioning systems – All water air conditioning systems – All air conditioning systems – Modularly and central air conditioning systems – Split air conditioners.

Module – IV (12 hrs.):

Home/Office Digital Devices: Facsimile machine – Xerographic copier – calculators – Structure of a calculator – Internal organization of a calculator – Servicing electronic calculators – Digital clocks – Block diagram of a digital clock.

Module – V (12 hrs.):

Digital Access Devices: Digital computer – Internet access – online ticket reservation – functions and networks – barcode scanner and decoder – Electronic Fund Transfer – Automated Teller Machines(ATMs) – Set-Top boxes – Digital cable TV – Video on demand.

Text books:

1. S.P. Bali, Consumer Electronics - Pearson Education, New Delhi, 2005.
2. R. G. Gupta Audio and Video systems Tata McGraw Hill (2004)

Web Links:

1.
2.

Activities proposed

Measurable:

1. Assignments on Block diagram of Microwave oven, types of microwave oven, software and software of washing machines, types of washing machine, features of washing machines, Components of washing machines, all water air conditioning system, all air conditioning systems, facsimile machine, xerographic copier, calculators, Digital computer, online ticket reservation, Automated teller machines(ATMs).

2. Student seminars (Individual presentation of papers) on topics Microwave oven, types of washing machine, features of washing machines, Components of washing machines, all water air conditioning system, all air conditioning systems, split air conditioners, servicing of electronic calculators, Digital clocks, internet access, barcode scanner and decoder, set-top boxes, digital cable TV.
3. Quiz Programmes on microwave oven, washing machines, air conditioners and refrigerators, Home/office devices, digital access devices.
4. Individual Field Studies/projects on working mechanism of washing machines, air conditioners, refrigerators and different digital devices.
5. Group discussion on applications of electronic instruments.
6. Group/Team Projects on servicing of refrigerator, washing machines, air conditioners, xerographic copier.

General:

7. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
8. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
9. Any similar activities with imaginative thinking.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	3	3	3	1	1	-	1	3	3	1	3
CO2	3	2	2	3	3	3	3	1	-	3	2	2	2	3
CO3	3	3	3	2	2	2	1	1	1	2	2	3	3	2
CO4	3	3	2	2	2	3	3	1	1	1	3	3	2	3
Avg.														

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – V
w.e.f. 2020 - 21 ADMITTED BATCH
PAPER – 7 B [General Elective EL7205B]

CONSUMER ELECTRONICS

4 Hours/Week [Total: 60 hrs.] **Credits: 04**

MODEL QUESTION PAPER

Note: - Set the question paper as per the blue print given.

Time: $2\frac{1}{2}$Hrs. **Max. Marks: 60**

Section	Questions to be given	Questions to be answered	Marks
A	6	3	3 x 10M = 30M
B	12	6	6 x 5 M = 30M
Total	18	9	60M

Blue Print

Module Name	Essay Questions [10 marks]	Short Questions [5 marks]	Marks allotted
Microwave ovens	1	3	25
Washing machines	2	2	30
Air conditioners and refrigerators	1	2	20
Home/office digital devices	1	3	25
Digital access devices	1	2	20
Total Marks			120

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – V
w.e.f. 2020 - 21 ADMITTED BATCH
PAPER – 7 B [General Elective EL7205B]

CONSUMER ELECTRONICS

MODEL QUESTION PAPER

Time: 2 ½ hrs. **Max Marks: 60M**

Section - A

Answer any Three questions by choosing at least one question from each part

3 X 10 = 30 M

Part – A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 2

Part – B

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section – B

Answer any Four questions **6 X 5 = 30 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 1
9. Short answer question from Module - 1
10. Short answer question from Module - 2
11. Short answer question from Module - 2
12. Short answer question from Module - 3
13. Short answer question from Module - 3
14. Short answer question from Module - 4
15. Short answer question from Module - 4
16. Short answer question from Module - 4
17. Short answer question from Module - 5
18. Short answer question from Module - 5

PAPER – 7 B [General Elective EL7205B]
CONSUMER ELECTRONICS
Question Bank

MODULE- I
ESSAY QUESTIONS

1. Explain the block diagram of microwave oven
2. Sketch and explain the LCD timer with alarm.
3. Explain Wiring and Safety instructions of microwave oven.

SHORT ANSWER QUESTIONS

4. Explain Types of Microwave oven.
5. Explain Care and Cleaning.
6. Explain Single-Chip Controllers with the help of diagrams.
7. Discuss about the ranges that are used in Microwave ovens.

MODULE- II
ESSAY QUESTIONS

8. Explain the block diagram of electronic controller for washing machines.
9. Discuss about washing machine hardware and software.
10. Explain Fuzzy logic washing machines.

SHORT ANSWER QUESTIONS

11. Explain Types of washing machines.
12. Describe the features of washing machines.

MODULE- III
ESSAY QUESTIONS

13. Describe various components of air conditioning systems.
14. Explain All water air conditioning systems.
15. Explain All air conditioning systems.

SHORT ANSWER QUESTIONS

16. Explain Medullary and central air conditioning systems.
17. Describe Split air conditioners.

MODULE- IV
ESSAY QUESTIONS

18. Describe Calculator? Explain the structure of a calculator
19. Explain Internal Organization of a calculator.
20. Draw the Block diagram of a digital clock. Explain each block.

SHORT ANSWER QUESTIONS

21. Describe Xerographic copier.

22. Explain Facsimile machine.
23. Discuss about Digital clock.
24. Describe how electronic calculators can be serviced.

MODULE- V

ESSAY QUESTIONS

25. Discuss about Digital computer in detail.
26. Describe about the Barcode scanner and decoder.
27. Explain how electronic fund transfer can be done.
28. Illustrate online ticket reservation.

SHORT ANSWER QUESTIONS

29. Illustrate Automated Teller Machines (ATMs).
30. Explain Set-Top boxes.
31. Explain Digital cable TV and Video on demand.
32. Describe how to access Internet.

	P. R. College (Autonomous), Kakinada	Program & Semester III B.Sc. Electronics (V Semester) Paper – VII B			
Course Code **EL7205BP**	**TITLE OF THE COURSE** **Consumer Electronics**				
Demonstration	Hours Allocated: 30 (Practical)	L	T	P	C
Pre-requisites		-	-	2	1

Course Objectives:

1. To study the working of different instruments/appliances.
2. To install and uninstall of different appliances.
3. To survey of products.
4. To identify a problem and learn how to troubleshoot.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Studied the working of different instruments/appliances.
CO2	Installation and uninstallation of different appliances.
CO3	Survey of different products.
CO4	Identify problem and its trouble shooting.

Course with focus on employability / entrepreneurship / Skill Development modules

At least two Activities should be done

1. Study of PA systems for various situations - Public gathering, closed theatre/Auditorium, Conference room, Prepare Bill of Material (Costing).
2. Installation of Audio /Video systems - site preparation, electrical requirements, cables and connectors.
3. Market Survey of Products (at least one from each module).
4. Identification of block and tracing the system.
   Assembly and Disassembly of system using Toolkit.
5. Assembly and Disassembly of system & printer

NOTE: One activity as directed in practical course is equivalent to 4 experiments 5

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	2	3	3	1	-	-	1	3	3	2	3
CO2	2	2	2	3	2	2	2	-	-	2	2	2	2	2
CO3	2	2	3	2	2	3	2	-	-	2	3	2	3	2
CO4	3	2	2	2	3	2	2	-	-	1	2	3	2	3
Avg.														

	P. R. College (Autonomous), Kakinada	**Program & Semester** III B.Sc. Electronics (V Semester) Paper – VI C			
Course Code **EL6205C**	**TITLE OF THE COURSE** **VLSI Design**				
Teaching	Hours Allocated: 60 (**Theory**)	L	T	P	C
Pre-requisites	CMOS circuits	4	-	-	4

Course Objectives:

1. To learn basic CMOS circuits.
2. To learn CMOS process technology.
3. To design technologies of chip design using programming devices.
4. To learn the concepts of designing VLSI subsystems.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Identify the various IC fabrication methods.
CO2	Acquire knowledge on CMOS process technology.
CO3	Concepts of modeling a digital system using Hardware Description Language (HDL)
CO4	Design analog & digital CMOS circuits for specified applications.

Course with focus on employability / entrepreneurship / Skill Development modules

Skill Development		**Employability**		**Entrepreneurship**	

SYLLABUS

Module-I (12 hrs.)

Integrated Circuit- Definition, Classification's, and Advantages of IC's – MOS Transistors: Enhancement type, Depletion type, Modes of NMOS – CMOS, Fabrications: n-Well, p-Well.

Module-II (11 hrs.)

NMOS Inverter – CMOS inverter – VLSI Design Flow: Design Specification's Design Entry – Examples of (Circuit Diagrams only) NMOS, PMOS and CMOS.

Module-III (11 hrs.)

Basic logic gates in CMOS – Complex logic gate: Two, Three inputs of CMOS NAND gate – Combinational Logic: Two and Three inputs of CMOS NOR gate – Compound gates in CMOS.

Module-IV (13 hrs.)

VHDL: Brief History, Logical, Relational, Arithmetic, Shift and Rotate Operators, Data types.

Verilog HDL: Brief History, Logical, Relational, Arithmetic, Shift and Rotate Operators, Data types – Comparison of VHDL and Verilog HDL.

Module-V (13 hrs.)

Data – Flow Description's and HDL programs:-

Basic Logic Gates, Universal Gates, Half-Adder, Multiplexer, Magnitude Comparator, Binary Adder.

Text books:

1. VLSI Design by Vilas S.Baged.
2. VHDL and Verilog programming By Nazeih M.Botros.
3. VLSI Design By A.Albert Raj and T.Latha.

Web Links:

1.
2.

Activities proposed

Measurable:

1. Assignments on Classification and advantages of IC's, Types of MOS transistors, VLSI design flow, Basic logic gates in CMOS, Concept of VHDL, Concept of Verilog HDL, comparison of VHDL & Verilog HDL, HDL programs.

2. Student seminars (Individual presentation of papers) on topics relating to Enhancement MOS transistor, Depletion MOS transistor, Modes of NMOS & CMOS, fabrication techniques, NMOS inverter & CMOS inverter, compound gates, VHDL, Verilog HDL, circuits of gates.
3. Quiz Programmes on ICs, VLSI design, basic logic gates in CMOS, VHDL, Verilog VHDL, Logic gates.
4. Individual Field Studies on Verilog HDL.
5. Group discussion on fabrication methods, NMOS & CMOS inverters, Verilog HDL.

General:

6. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
7. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
8. Any similar activities with imaginative thinking.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	2	3	3	2	-	1	1	3	3	1	3
CO2	3	2	3	3	2	3	3	1	-	3	2	2	2	3
CO3	2	3	3	3	3	2	2	1	1	2	3	3	3	2
CO4	3	2	3	2	2	3	3	1	1	1	3	3	2	3
Avg.														

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – V
w.e.f. 2020-21 ADMITTED BATCH
PAPER – 6 C [General Elective EL6205C]

VLSI Design

4 Hours/Week [Total: 60 hrs.] **Credits: 03**

MODEL QUESTION PAPER

Note: - Set the question paper as per the blue print given.

Time: $2\frac{1}{2}$Hrs. **Max. Marks: 60**

Section	Questions to be given	Questions to be answered	Marks
A	6	3	3 x 10M = 30M
B	12	6	6 x 5 M = 30M
Total	18	9	60M

Blue Print

Module Name	Essay Questions [10 marks]	Short Questions [5 marks]	Marks allotted
Module – I	1	3	35
Module - II	1	3	25
Module - III	1	2	20
Module – IV	2	2	20
Module - V	1	2	20
Total Marks			120

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – V
w.e.f. 2020-21 ADMITTED BATCH
PAPER – 6 C [General Elective EL6205C]

VLSI Design

MODEL QUESTION PAPER

Time: 2 ½ hrs. **Max Marks: 60M**

Section - A

Answer any Three questions by choosing at least one question from each part

3 X 10 = 30 M

Part – A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 3

Part – B

4. Essay question from Module – 4
5. Essay question from Module – 4
6. Essay question from Module – 5

Section – B

Answer any Four questions **6 X 5 = 30 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 1
9. Short answer question from Module - 1
10. Short answer question from Module - 2
11. Short answer question from Module - 2
12. Short answer question from Module - 2
13. Short answer question from Module - 3
14. Short answer question from Module - 3
15. Short answer question from Module - 4
16. Short answer question from Module - 4
17. Short answer question from Module - 5
18. Short answer question from Module - 5

	P. R. College (Autonomous), Kakinada	Program & Semester III B.Sc. Electronics (V Semester) Paper – VI C			
Course Code **EL6205CP**	**TITLE OF THE COURSE VLSI Design**				
Demonstration	Hours Allocated: 30 (Practical)	L	T	P	C
Pre-requisites		-	-	2	1

Course Objectives:

1. To develop programs for different applications.
2. To Interface 8051 with D/A & A/D converter and generate different types of wave forms.
3. To generate traffic signals using embedded systems.
4. To control temperature by using embedded systems.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Concepts of modeling a digital system using HDL.
CO2	Study of different circuits.
CO3	Learnt the concepts of designing VLSI subsystems.
CO4	Design of various circuits.

Course with focus on employability / entrepreneurship / Skill Development modules

Any Five experiments should be done

1) Basic Gates Circuit
2) Universal Gates
3) Half –Adder
4) Full –Adder
5) Multiplexer
6) Decoder
7) S-R Latch
8) D-Latch
9) Magnitude Comparator
10) Binary Adder

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	2	2	3	3	3	1	-	-	1	3	3	2	3
CO2	3	2	3	3	2	2	3	-	-	2	2	2	2	2
CO3	2	3	3	2	3	2	1	-	-	2	3	2	3	2
CO4	3	2	2	2	2	3	3	-	-	1	2	3	2	3
Avg.														

	P. R. College (Autonomous), Kakinada	Program & Semester III B.Sc. Electronics (V Semester) Paper – VII C			
Course Code **EL7205C**	**TITLE OF THE COURSE** **Data Communication & Networking**				
Teaching	Hours Allocated: 60 (**Theory**)	L	T	P	C
Pre-requisites		4	-	-	4

Course Objectives:

1. To study about network topologies like bus, star, ring, mesh tree, hybrid .
2. To study about transmission media.
3. To study about data transmission types.
4. To study multiplexing techniques and modems.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Created awareness on network and its types & also on network topologies.
CO2	Studied about different types of transmission media.
CO3	Knowledge on different types of data transmissions.
CO4	Acquire knowledge on different multiplexing techniques and modems.

Course with focus on employability / entrepreneurship / Skill Development modules

Skill Development		Employability		Entrepreneurship	

SYLLABUS

Module –I (12 Hrs.):

Data Communication and its Components – Introducing of Network, Types of Networks: Personal Area Network, wide Area Network.

Module-II (14 hrs.):

Network Topologies: Bus Topology, Star Topology, Ring Topology, Mesh Topology, Tree Topology, Hybrid, Topology

MODULE-III (10 Hrs.):

Transmission Media's - Guided Media: Twisted pair Cable, Coaxial Cable, Optical Fiber Cable. Un-Guide Media: Radio Waves, Microwaves, Infrared.

MODULE-IV (10 Hrs.):
Data Transmissions: Digital – To – Digital Conversion (line coding only), Analog – To – Digital Conversion (PCM only), Digital – To – Analog (ASK only) Analog – To – Analog Transmission (AM only) – Transmission Modes (Parallel and Serial).

MODULE – V (14 Hrs.):
Frequency Division Multiplexing, Time Division Multiplexing Wave Division Multiplexing. Modems: Traditional Modems, Cable Modems.

Text books:

1. Data communication and Networking (2 Edition) By Behrouz A.Forouzan.
2. Data and Communication by Stallings Williams.
3. Computer Networks By Kurose James F

Web Links:

1.
2.

Activities proposed

Measurable:

1. Assignments on Personal area network, wide area network, network topologies, guided media, un-guide media, data transmissions, transmission modes, multiplexing techniques and types of modems.
2. Student seminars (Individual presentation of papers) on topics data communication and its components, types of networks and its advantages, network topologies and its advantages, transmission media, PCM, ASK, AM, transmission modes, FDMA, TDMA and modems
3. Quiz Programmes on networks, network topologies, transmission media, data transmissions, multiplexing techniques and modems.
4. Individual Field Studies/projects on different types of topologies and different types of transmission media.
5. Group discussion on network topologies, transmission media, data transmissions, multiplexing techniques.
6. Group/Team Projects on providing LAN to computer lab.

General:

7. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
8. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers

9. Any similar activities with imaginative thinking.

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	3	3	3	2	-	-	1	3	3	2	3
CO2	3	3	3	3	3	3	3	1	1	2	2	3	2	3
CO3	2	3	3	3	2	2	2	-	1	3	3	2	2	2
CO4	3	2	3	2	2	3	3	-	1	1	3	3	2	3
Avg.														

P.R. GOVERNMENT COLLEGE (A), KAKINADA

B.Sc. III Year - Electronics – Semester – V

w.e.f. 2020 - 21 ADMITTED BATCH

PAPER – 7 C [General Elective EL7205C]

Data Communication & Networking

4 Hours/Week [Total: 60 hrs.] **Credits: 03**

MODEL QUESTION PAPER

Note: - Set the question paper as per the blue print given.

Time: $2\frac{1}{2}$Hrs. **Max. Marks: 60**

Section	Questions to be given	Questions to be answered	Marks
A	6	3	3 x 10M = 30M
B	12	6	6 x 5 M = 30M
Total	18	9	60M

Blue Print

Module Name	Essay Questions [10 marks]	Short Questions [5 marks]	Marks allotted
Module – I	1	3	25
Module - II	2	2	30
Module - III	1	2	20
Module – IV	1	2	20
Module - V	1	3	25
Total Marks			120

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – V
w.e.f. 2020 - 21 ADMITTED BATCH
PAPER – 7 C [General Elective EL7205C]

Data Communication & Networking

MODEL QUESTION PAPER

Time: 2 ½ hrs. **Max Marks: 60M**

Section - A

Answer any Three questions by choosing at least one question from each part

3 X 10 = 30 M

Part – A

1. Essay question from Module – 1
2. Essay question from Module – 2
3. Essay question from Module – 2

Part – B

4. Essay question from Module – 3
5. Essay question from Module – 4
6. Essay question from Module – 5

Section – B

Answer any Four questions **6 X 5 = 30 M**

7. Short answer question from Module - 1
8. Short answer question from Module - 1
9. Short answer question from Module - 1
10. Short answer question from Module - 2
11. Short answer question from Module - 2
12. Short answer question from Module - 3
13. Short answer question from Module - 3
14. Short answer question from Module - 4
15. Short answer question from Module - 4
16. Short answer question from Module - 5
17. Short answer question from Module - 5
18. Short answer question from Module - 5

	P. R. College (Autonomous), Kakinada	Program & Semester III B.Sc. Electronics (V Semester) Paper – VII C			
Course Code **EL7205CP**	**TITLE OF THE COURSE Data Communication & Networking**				
Demonstration	Hours Allocated: 30 (Practical)	L	T	P	C
Pre-requisites		-	-	2	1

Course Objectives:

1. To study about network topologies like bus, star, tree.
2. To study about different transmission media.
3. To study about interfacing of ports.
4. To Convert different types of data.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Studied about different types of topologies like bus, star & tree.
CO2	Aware of different transmission media and their advantages.
CO3	Observe different data transfer techniques & interfacing of ports .
CO4	Acquire knowledge on different types of data conversions.

Course with focus on employability / entrepreneurship / Skill Development modules

Any Five Experiments Should Be Done

1. To study different types of transmission media.
2. To study the serial interface using rs-232.
3. To study LAN using star topology
4. To study LAN using bus topology
5. To study LAN using tree topology
6. To study configure modem of computer
7. To study configure hub/switch
8. Analog to digital conversion
9. Digital to analog conversion

CO-PO Mapping:

(1:Slight[Low]; 2:Moderate [Medium]; 3:Substantial [High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO
CO1	3	3	2	2	2	3	1	-	-	1	3	3	2	2
CO2	2	2	2	3	2	2	3	-	-	2	2	2	2	3
CO3	3	2	2	2	2	2	2	-	-	2	2	2	2	2
CO4	2	2	2	2	2	2	2	-	-	1	2	3	2	3
Avg.														

P.R. GOVERNMENT COLLEGE (A), KAKINADA

DEPARTMENT OF PHYSICS & ELECTRONICS

WORK LOAD FOR THE YEAR 2022 - 23

Name of the Subject : ELECTRONICS

Total No. of Hours : **120**

	Strength	Name of the class	Theory hours	Practical Hours	No. of Batches	Total Practical Hours	Total hrs. (Theory + Practical)
1	30	I MPE	4	2	2	4	8
2	30	I MECS	4	2	2	4	8
3	30	I MEIot	4	2	2	4	8
4	30	II MPE	4	2	2	4	8
5	30	II MECS	4	2	2	4	8
6	30	II MEIot	4	2	2	4	8
7	30	II MPE Sem IV - Paper V	4	2	2	4	8
8	30	II MECS Sem IV - Paper V	4	2	2	4	8
9	30	II MEIot Sem IV - Paper V	4	2	2	4	8
10	30	III MPE Sem V - Paper VI	4	2	2	4	8
11	30	III MPE Sem V - Paper VII	4	2	2	4	8
12	30	III MECS Sem V - Paper VI	4	2	2	4	8
13	30	III MECS Sem V - Paper VII	4	2	2	4	8
14	30	III MEIot Sem V – Paper VI	4	2	2	4	8
15	30	III MEIot Sem V – Paper VII	4	2	2	4	8
		Total Work load for the department of ELECTRONICS					120

P.R. GOVERNMENT COLLEGE (A), KAKINADA
DEPARTMENT OF PHYSICS & ELECTRONICS

WORK LOAD For Re-Structured Courses For the Year 2022 - 23

ODD SEMESTER

Name of the Subject : ELECTRONICS

Total No. of Hours : **64**

S. No	Strength	Name of the class	Theory hours	Practical Hours	No. of Batches	Total Practical Hours	Total hrs. (Theory + Practical)
1	30	I MECS	4	2	2	4	8
2	30	I MEiot	4	2	2	4	8
3	30	II MECS	4	2	2	4	8
4	30	II MEiot	4	2	2	4	8
5	30	III MECS Sem V - Paper VI	4	2	2	4	8
6	30	III MECS Sem V - Paper VII	4	2	2	4	8
7	30	III MEIot Sem V – Paper VI	4	2	2	4	8
8	30	III MEIot Sem V – Paper VII	4	2	2	4	8
		Total Work load					**64**

WORK LOAD For Re-Structured Courses For the Year 2022-23

EVEN SEMESTER

Name of the Subject : ELECTRONICS

Total No. of Hours : **48**

S. No	Strength	Name of the class	Theory hours	Practical Hours	No. of Batches	Total Practical Hours	Total hrs. (Theory + Practical)
1	30	I MECS	4	2	2	4	8
2	30	I MEiot	4	2	2	4	8
3	30	II MECS Sem IV – Paper IV	4	2	2	4	8
4	30	II MEiot Sem IV – Paper IV	4	2	2	4	8
5	30	II MECS Sem IV – Paper V	4	2	2	4	8
6	30	II MEiot Sem IV – Paper V	4	2	2	4	8
		Total Work load					**48**

WORK LOAD For Conventional Courses For the Year 2022 - 23

ODD SEMESTERS

Name of the Subject : ELECTRONICS

Total No. of Hours : **32**

	Strength	Name of the class	Theory hours	Practical Hours	No. of Batches	Total Practical Hours	Total hrs. (Theory + Practical)
1	30	I MPE	4	2	2	4	8
2	30	II MPE	4	2	2	4	8
3	30	III MPE Sem V - Paper VI	4	2	2	4	8
4	30	III MPE Sem V - Paper VII	4	2	2	4	8
		Total Work load					**32**

WORK LOAD For Conventional Courses For the Year 2022 - 23

EVEN SEMESTERS

Name of the Subject : ELECTRONICS

Total No. of Hours : **24**

	Strength	Name of the class	Theory hours	Practical Hours	No. of Batches	Total Practical Hours	Total hrs. (Theory + Practical)
1	30	I MPE	4	2	2	4	8
2	30	II MPE Sem IV – Paper IV	4	2	2	4	8
3	30	II MPE Sem IV - Paper V	4	2	2	4	8
		Total Work load					**24**

LIST OF EXAMINERS / PAPER SETTERS IN ELECTRONICS

2022 – 23

S. No.	Name of the examiner	Subject	Name of the College
1	Ch. Kanakarao 9848943943	Electronics	Y.N. College, Narsapur
2.	S. Venkata Raju 9246678554	Electronics	D.N.R.College, Bhimavaram, W.G.Dist.
3.	Dr. Y.V.Apparao	Electronics	S.V.K.P. & Dr.K.S.Raju College of Arts & Science, Penugonda, West Godavari dist.
4.	Dr. P.L.Rambabu	Electronics	A.V.N.College, Visakhapatnam
5	K. Ramesh	Electronics	C.R.R. College (M) Eluru
6	K.B.S. Gopal	Electronics	C.R.R. College (M) Eluru
7	P.P. Divakar	Electronics	C.R.R. College (M) Eluru
8	V. Venkateswararao	Electronics	C.R.R. College (M) Eluru
9	A. Veera Bhadra Rao	Electronics	C.R.R. College (M) Eluru
10	L.S.R.Ch.V.K.Nageswararao	Electronics	C.R.R. College (M) Eluru
11	K.S.Ch.Srinivasa Rao	Electronics	C.R.R. College (M) Eluru
12	G.Vijayalakshmi	Electronics	C.R.R. College (M) Eluru
13	K. Ravikumar	Electronics	C.R.R. College (M) Eluru
14	A.Srinivasa Rao	Electronics	K.G.R.L.College , Bhimavaram
15	S.Srinivas	Electronics	K.G.R.L.College , Bhimavaram
16	Y.Sri Devi	Electronics	C.R.R. College (W), Eluru
17	S.V.Kumara Sastry	Electronics	S.K.B.R.College, Amalapuram
18	V.Radha Krishna	Electronics	S.K.B.R.College, Amalapuram
19	Esub Basha Sheik	Electronics	GC (A), Rajamahendravaram
20	E. Nageswara rao	Electronics	GDC (M), Nidadavole
21	Dr. P.V.S.S.S.N. Reddy	Electronics	GC (A), Rajamahendravaram
22	V. Ratna Sekhar	Electronics	D.N.R. College (A), Bhimavaram
23	K.H.R. Singh	Electronics	D.N.R. College (A), Bhimavaram
24	D. Ganga dharudu	Electronics	M.R. College, Peddapuram
25	A.Satya narayana Murthy	Electronics	M.R. College, Peddapuram
26	K. Venkateswarlu, HOD	Electronics	Y.N.College, Narsapur

P. R. GOVERNMENT COLLEGE (A), KAKINADA

Department of Physics & Electronics
Departmental Activities Planned for 2022 - 2023

The department of Physics and Electronics is planning the following programs to conduct for the academic year 2022 - 2023

Sl. No.	Activity	Probable date	Remarks
1	Post admission test	Oct 1st week	
2	Distribution of money under Upkar Scheme	Oct 2nd week	
3	Field visit -- Airport Communication center, Rajahmundry/ Hinduja National Power Corporation Limited (HNPCL),Vizag.	Oct 3rd week	
4	Parent Teacher Meeting & Training for Laboratory staff on Handling new equipment	Oct 4th week	
5	Guest Lecture -1	Nov 1st week	
6	Activity Observation of Sir C.V. Raman's Birthday	Nov 2nd week	
7	Awareness programme on IMD	Nov 3rd week	
8	Study Area Programme -- Industrial Training on Bio-fuel sector.	Nov 4th week	
9	Extension activity to local high schools i.e., Outreach programme & Student Training Programme on Mini Physics talent search	Dec 2nd week	
10	Participate/Arrange -- National & International conferences, workshops & seminars	Dec 3rd week	
11	Online Quiz programme	January 1st week	
12	College level Chess Competition & Workshop for Laboratory Staff on	January 3rd week	

	Maintenance of the Equipment.		
13	Guest Lecture on solar power output measurements by Manager from NETCAP	February 2nd week	
14	Workshop on preparation of science Projects / Intercollegiate Science Competitions	February 3rd week	
15	National Science Day celebrations	February 28th	
16	UPKAR scheme – Disbursement of money to the students	March 1st week	
17	Student Counseling before commencement of semester end exams	April 4th week	
18	Summer training programme/Attend workshops, seminars for students.	May 1st week	
19	Guest lecture/Faculty Development Programme/ Webinar on Online educational tools/ innovative pedagogical techniques/ Curriculum Design, Development & Implementation Methodology.	June 2nd week	
20	Hands on training On Robotics by EBREAKERS.	June 3rd week	

P. R. GOVERNMENT COLLEGE (A), KAKINADA

Department of Physics & Electronics

Budget Proposal for the Academic Year 2022-23

S. No.	PURPOSE	EXPENDITURE ESTIMATED	REMARKS
1.	Upgradation of 1st year Lab	Rs. 50,000=00	
2.	Upgradation of 2nd year Lab and dark room	Rs. 50,000=00	
3.	Upgradation of final year Lab	Rs. 50,000=00	
4.	Requirement of Lab Equipment for V-SEM papers	Rs. 1,00,000=00	
5. `	Research Materials and Characterization Devices for Research lab	Rs. 3,00,000=00	
6.	Student projects/Educational Tour	Rs. 1,00,000=00	
7.	National level Activity	Rs. 2,00,000=00	
8.	Departmental Activities@ National Sc.Day, Guest Lectures, Intercollegiate competitions	Rs.1,00,000=00	
9.	Miscellaneous@ Stationery, Maintenance of Laboratories etc.	Rs. 50,000=00	
	TOTAL:	Rs. 10,00,000	

Budget estimated is Rupees Ten Lakhs only

BOS CERTIFICATION

P. R. GOVERNMENT COLLEGE (A), KAKINADA
Department of Physics & Electronics

This is to certify that the proposed agenda of board of studies meeting held in Department of Physics & Electronics on -10-2022, for the Academic Year 2022-23 have been discussed and approved by the board members unanimously. The valuable suggestions have been adopted for effective implementation of Curricular/Co-curricular and Research activities for the academic year 2022-23.

- Syllabi regarding all semesters of B.Sc program.
- Following the scheme of evaluation for CIA&SEE for all the semesters I-V of I,II &III B.Sc. Programs.
- Following the allocation of Credits for all the semesters of B.Sc. programme
- Offering one "Community Service Project" as a credit course to I year students, one skill enhancement course as a credit course for II year and internship for III year before completion of the course during summer vacation in either V or VI semester.
- Certificate courses offered by the Department of Physics& Electronics
- List of Examiners
- Departmental action plan for the academic year 2022-23.
- Budget proposal for the academic year 2022-23.

Members of Board of Studies			Signatures of members
1	Sri U.V.B.B. Krishna Prasad, In-charge dept. of Electronics	Chair person	
2	Dr. P. Paul Diwakar, Lecturer in Physics, YVNR Govt. College, Kaikaluru	University nominee	
3	Sri D. Gangadharudu, Lr. in Electronics, MR college, Peddapuram	Subject Expert	
4	Sri K. Venkateswara Rao, Lec.in charge/Phy, ASD college (W)(A), Kakinada	Local Nominee	31/10/22

5	Sri B. Sudarshan, Andhra Electronics, Kakinada.	Representative from Industry	31.10.22
6	Dr. K. Nanda Gopal, Sr. Scientific assistant, IMD	Student Alumni	
7	Smt. M. Surekha	Member	
8	Dr. K. Jaya Dev	Member	
9	Kum G. Sridevi	Member	
10	Smt. A. Padmavathi	Member	
11	Dr. S.V.G.V.A. Prasad	Member	
12	Sri P. Himakar	Member	
13	Sri B. Srikanth	Member	
14	Sri K. Durga Rao	Member	
15	N. Bhagya Lakshmi	Student II MPE	
16	D. Geetha Rani	Student II MECs	
17	P. Veerababu	Student I MECs	
18	G. Vijay	Student I MEIot	