P.R. GOVERNMENT COLLEGE, KAKINADA

AN AUTONOMOUS COLLEGE WITH NAAC "A" GRADE

DEPARTMENT OF ELECTRONICS

Board of Studies

Electronics

2021 – 2022

P.R. Government College (A), Kakinada

Department of Electronics

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P.R.Government College (A), Kakinada

Department of Electronics

Agenda

Discuss and Approve

1. Syllabus for the Semesters
2. Model question papers and Blue Print
3. Panel of Question paper setters and Examiners.
4. Methodologies of Teaching Learning
5. Internal Assessment Component
6. Minimum mark in Internal Assessment
7. Introducing of new courses of study and possibilities.
8. Admission criteria for programs offered by the department
9. Proposal community service / extension activities / projects for the benefit of the society.
10. Any other proposal with the permission of the Chair

P.R. Government College (A), Kakinada

Department of Electronics

RESOLUTIONS BOARD OF STUDIES MEETING OF PHYSICS

November 2021

1. It is resolved to continue to offer two Electives in VI semester for the present academic year 2021 – 22 as done in the previous year ie., 2020-21. The student has to choose one of the two electives.
   VII A Micro Controller and Interfacing
VII BPC maintenance and trouble shooting

2. It is resolved to offer twoCluster Electives in semester VI comprising of three papers each. The student has to choose one of the two electives.

   Cluster Elective A
   - **VIII A1:** Power Electronics
   - **VIII A2:** Consumer Electronics
   - **VIII A3:** Embedded Systems Design

   Cluster Elective B
   - **VIII B1:** Computer networks
   - **VIII B2:** Electronic instrumentation
   - **VIII B3:** Optical Fiber Communication

3. It is resolved to approve the Question Bank and Blue print for I, II & III years

4. It is resolved to approve the conduct of semester end practical exams for all I, II & III years uniformly from the academic year 2021 - 22

5. It is resolved to approve blue print for Practical examination for all three years.

6. It is resolved to approve to conduct Two mid semester examinations for Internal assessment for I year Students from academic year 2021 – 22, each of 25 Marks. An average of both the examinations would be taken for internal assessment.

7. It is resolved to approve question bank of MCQ's intended for I mid examination for I year students.

8. It is resolved to approve to continue to conduct two theoretical mid semester examination for II & III year students.

9. It is resolved to approve blue print for internal examination for all three years.

10. It is resolved to approve the split up of Continuous Comprehensive Evaluation

For I year CCE – 25 Marks

10 M – Study Project(Theoretical for odd sem / Practical for even sem)
10M – Viva-voce on subject
05M – Assignment / Quiz /Group discussion

For II & III year CCE – 20 Marks

10 M – Mini Project
5M - Seminar/ Assignment
5 M – Quiz /Group discussion

11. It is resolved to approve Department Action Plan for the academic year 2021-22.

12. Resolved to approve funds allocated under various heads

Sl. No	Purpose	Projected Amount
1	Board of Studies	5,000/-
2	Invited Lectures	15,000/-
3.	lab equipment	2,00,000/-
4	Reference Books	50,000/-
5.	Teaching learning Material	20,000/-
6.	Minor Repairs and Stationery	40,000/-
7.	Outreach Programme	20,000/-
8.	Study Area Programme	50,000/-
9	Teacher Training Programme	1,00,000/-
Total		**5,00,000/-**

P.R. Government College (A), Kakinada

Department of Electronics

AIM AND OBJECTIVES OF THE PROGRAMME

Aim

In this programme, we aim to provide a solid foundation in all aspects of Electronics and to show a broad spectrum of modern trends in Electronics and to develop experimental, computational and mathematical skills of students. The syllabi are framed in such a way that it bridges the gap between the plus two and post graduate levels of physics by providing a more complete and logical framework in almost all areas of basic physics.

The programme also aims

- To provide education in Electronics of the highest quality at the undergraduate level and generate graduates of the caliber sought by industries and public service as well as academic teachers and researchers of the future.
- To attract outstanding students from all backgrounds.
- To provide an intellectually stimulating environment in which the students have the opportunity to develop their skills and enthusiasms to the best of their potential.
- To maintain the highest academic standards in undergraduate teaching.
- To impart the skills required to gather information from resources and use them.
- To equip the students in methodology related to physics.

OBJECTIVES/OUT COMES

By the end of I year (2nd semester), the students should have,

- Apply concepts of electric network topology, nodes, branches, loops to solve circuit problems including the use of computer simulation.
- Developed their experimental and data analysis skills through a wide range of experiments in the practical laboratories.

By the end of II year (4th semester), the students should have

- Demonstrate the ability to design practical circuits that perform the desired operation.
- Use of different modulation and demodulation techniques used in analog communication.
- The student gain good knowledge on microprocessor and implement in practical applications

By the end of III year (6th semester), the students should have

- Covered a range of topics in almost all areas of Electronics including Power electronics, Consumer electronics and Embedded systems.
- The experience of independent work such as projects, seminars etc.
- Developed their understanding of core Electronics.

Abstract of Course Wise Allocation of Credits

College :P.R. Government College (A), Kakinada **2021 – 22Course : B.Sc.** **Subject :Electronics**

Department of Electronics

S. No	Semester	PAPER	Course Code	Course	Hours/ Week	Hours/ Sem	Max. Marks	No. of Credits	Course Credits
1	I	PAPER – 1	EL1202	Circuit theory and electronic devices	04	60	50 + 50	4	4
2	I	Practical – 1	EL1202 P	Circuit theory and electronic devices	03	30	50	1	1
3	II	PAPER – 2	EL2202	Digital Electronics	04	60	50 + 50	4	4
4	II	Practical – 2	EL2202 P	Digital Electronics	03	30	50	1	1
5	III	PAPER – 3	EL3202	Analog circuits and communication	04	60	60 + 40	4	4
6	III	Practical – 3	EL3202 p	Analog circuits and communication	03	30	50	1	1
7	IV	PAPER – 4	EL4202	Microprocessor Systems	04	60	60 + 40	4	4
8	IV	Practical – 4	EL4202 P	Microprocessor Systems	03	30	50	1	1
9	V	PAPER - 5	EL5202	Microprocessors (Intel 8085)	03	45	60 + 40	3	3

10	V	Practical - 5	EL5202 P	Microprocessors (Intel 8085)	03	30	50	2	2
11	V	PAPER - 6	EL6202	Electronic communication systems	03	45	60 + 40	3	3
12	V	Practical - 6	EL6202 P	Electronic communication systems	03	30	50	2	2
13	VI	PAPER VII - A	Elective A	Micro Controller and Interfacing	03	45	60 + 40	3	3
14	VI	Practical VII (A)		Micro Controller and Interfacing	03	30	50	2	2
15	VI	PAPER VII - B	Elective B	PC maintenance and trouble shooting	03	45	60 + 40	3	3
16	VI	Practical VII (B)		PC maintenance and trouble shooting	03	30	50	2	2
17	VI	PAPER VIII(A)-1	Cluster Elective - A	Power Electronics	03	45	60 + 40	3	3
18	VI	Practical VIII (A) -1		Power Electronics	03	30	50	2	2
19	VI	PAPER VIII(A)-2		Consumer Electronics	03	45	60 + 40	3	3
20	VI	Practical VIII (A) -2		Consumer Electronics	03	30	50	2	2
21	VI	PAPER VIII(A)-3		Embedded Systems Design	03	45	60 + 40	3	3
22	VI	Practical VIII (A) -3		Embedded Systems Design / Project	03	30	50	2	2
23	VI	PAPER VIII(B)-1	Cluster Elective - B	Computer networks	03	45	60 + 40	3	3
24	VI	Practical VIII (B) - 1		Computer networks	03	30	50	2	2

25	VI	PAPER VIII(B)-2		Electronic instrumentation	03	45	60 + 40	3	3
26	VI	Practical VIII (B) - 2		Electronic instrumentation	03	30	50	2	2
27	VI	PAPER VIII(B)-3		Optical Fiber Communication	03	45	60 + 40	3	3
28	VI	Practical VIII (B) - 3		Optical Fiber Communication / Project	03	30	50	2	2
Total Credits 50									

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
ACDEMIC CELL

Allotment of Extra credits guidelines

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*

PRINCIPAL

ACADEMIC CO ORDINATOR

P.R. Government College (A), Kakinada
Blue print for the model paper – Electronics
Semester End External examination
For I year core courses
2021– 2022

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= $\frac{95-50}{95}\ x\ 100$

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

P.R. Government College (A), Kakinada
Blue print for the model paper – Electronics
Semester End External examination
For II&IIIyear core courses
2021– 2022

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 Year (Sem I & Sem II)Papers

S. No.	Type of question	No. of Questions Given			No. of Questionsto 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 $= \frac{45-25}{45} \times 100 = 44.44\ \%$

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 = 10 marks

Seminar/ GD/ Assignment = 5 marks

Total = 25 marks

P.R. Government College (A), Kakinada

Blue Print for Internal Theory Examination

For II year (Sem III & sem IV) &
III year (Sem V & sem VI) Papers

S. No.	Type of question	No. of Questions Given			No. of Questionsto 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	2	10	20
2	**Section – B** Short answer questions	4	5	20	4	5	20
TOTAL				**40**			**40**

Percentage of Choice given $= \frac{0}{40} \times 100 = 0\%$

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

Seminar / Assignment	= 5 marks
Group discussion / Quiz	= 5 marks
Mini Project	= 10 marks
Total	**= 20 marks**

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

Practial Paper

Scheme of Valuation for Practicals

Time: 3hrs Max.Marks:50

1. Formulae & Explanation	- 06 Marks
2. Tabular form + graph + circuit diagram	- 06 Marks
3. Observations	- 12 Marks
4. Calculation, graph, precaution and results	- 06 Marks
5. Viva voice	- 10 Marks
6. Records	- 10 Marks

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

For Microprocessor /Micro Controller Practicals

Scheme of Valuation for Practicals

Time:2 hrs Max.Marks:50

1. Flow chart	- 05 M
2. Algorithm	- 05 M
3. Program	- 14 M
4. Execution and Result	- 06 M
5. Viva voice	- 10 M
6. Record	- 10 M

P.R. GOVERNMENT COLLEGE (A), KAKINADA

DEPARTMENT OF ELECTRONICS

ADDITIONS AND DELETIONS IN THE I&II YEAR

Semester - II			
S. No.	Name of the Unit	**Topics added**	**Justification**
1	**Unit IV**	**Sequential digital circuits:** Serial in parallel out, parallel in serial out.	To make continuation with the previous topic
2	**Unit V**	**Memory devices:** Applications of memory devices	It is appropriate to include this topic in view of further studies and competitive exams
Semester - III			
	Name of the Unit	Topics added	Justification
3	**Unit V**	**Radio broadcasting and reception**: Types of wave propagation	Easy to understand how different types of communication channels are propagating signals on earth
Semester - IV			
	Name of the Unit	Topics Added	Justification
4	**Unit - I**	**CPU Architecture:** Flag register, Interrupts – maskable, non-maskable, hardware & software interrupts.	To make continuation with the previous topic
5	**Unit - III**	**8086:** Architecture of 8086, Register organization, Flag register, Addressing modes of 8086.	It is appropriate to include this topic in view of further studies and competitive exams

P.R.GOVERNMENT COLLEGE (A), KAKINADA
Electronics-Semester –1
Paper - 1[Code: EL12021]
w.e.f. 2021-22ADMITTED BATCH

Circuit Theory& Electronic Devices

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

Course Outcomes

After completing the Basic Electronics program, students will be able to:

1. Demonstrate the ability to evaluate the parameters of basic electronic components (wires, resistors, capacitors, diodes etc.) based on their physical parameters and dimensions.
2. **Design and solve the basic DC circuits using Kirchhoff's current and voltage laws.**
3. **Demonstrate the skills in solving problems concerning voltage, potential, current and Ohm's law.**
4. The capability to use abstractions to analyze and design simple electronic circuits.
5. An understanding of how complex devices such as semiconductor diodes and field-effect transistors are modeled and how the models are used in the design and analysis of useful circuits.
6. The capability to design and construct circuits, take measurements of circuitbehavior and performance, compare with predicted circuit models and explain discrepancies.
7. Describe the scientific principles that apply to the basic flow of electricity and explain the function of various materials used as conducting, semiconducting, and insulating devices in the construction of standard electrical/electronic circuits.
8. The objective of this course is to provide you with a comprehensive understanding of electronic circuits and devices
9. Analyze resistive circuits and determine currents and voltages.
10. Analyze the transient behavior of RC and RL circuits
11. Provide the fundamental knowledge in electronics to enable understanding of its applications.
12. Provide hands-on opportunities for students to construct electronic circuits and build electronic projects of varying difficulty levels, ranging from simple to intermediate.

Learning Outcomes:

Students will able to

1. Learn how to develop and employ circuit models for elementary electronic components, e.g., resistors, sources, inductors, capacitors, diodes and transistors;

2. Become adept at using various methods of circuit analysis, including simplified methods such as series-parallel reductions, voltage and current dividers, and the node method;

3. Appreciate the consequences of linearity, in particular the principle of superposition and Thevenin-Norton equivalent circuits.

4. Develop the capability to analyze and design simple circuits containing non-linear elements such resistors, sources, inductors, capacitors.

5. Acquire experience in building and trouble-shooting simple electronic analog circuits.

6. distinguish between the two main types of voltage sources

7. distinguish between a voltage source and a current source

8. convert voltage sources to current sources, and vice versa

9. Identify a resistive voltage divider and apply the voltage division formula to solve related problems

10. Identify a resistive current divider and apply the current division formula to solve related problems

11. Define the terms 'circuit', 'load', 'source', 'short-circuit', 'open-circuit' and 'overload'

(a) apply Kirchhoff's current and voltage laws to a series-parallel resistive circuit

(b) apply branch current analysis to DC circuits

(c) apply Thevenin's theorem to simplify circuits for analysis

(d) calculate the Thevenin’s parameters at the input and output terminals of BJT transistor amplifiers

(e) Determine the conditions for maximum power transfer to any circuit element.

P.R.GOVERNMENT COLLEGE (A), KAKINADA
Electronics-Semester –1
Paper – 1 [Code:EL12021]
w.e.f. 2021-22ADMITTED BATCH

Circuit Theory& Electronic Devices

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

Syllabus

UNIT- 1: (12Hrs)

SINUSOIDAL ALTERNATING WAVEFORMS: Definition of current and voltage. 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.

UNIT-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.

UNIT-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.

UNIT-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.

UNIT-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.

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

P.R.GOVERNMENT COLLEGE (A), KAKINADA
Electronics-Semester –1
Paper – 1 [Code: EL12021]
w.e.f. 2021-22ADMITTED BATCH

Circuit Theory& Electronic Devices

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: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

Chapter 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.

Basic Circuit Theory
QUESTION BANK

UNIT-I: SINUSOIDAL ALTERNATING WAVEFORMS

ESSAY QUESTIONS

1. Explain the following terms for an A.C. Signal (a) Average value (b) RMS value.
2. What is a phasor? Explain phasor notation. Describe how phasors are used to represent sinusoidal waveforms.

SHORT ANSWER QUESTIONS

3. Distinguish between A.C. and D.C.
4. Discuss A.C. circuit containing pure Resistance only.
5. Discuss A.C. circuit containing pure Capacitance only.
6. Discuss A.C. circuit containing pure Inductance only.

UNIT-II: PASSIVE NETWORKS

ESSAY QUESTIONS

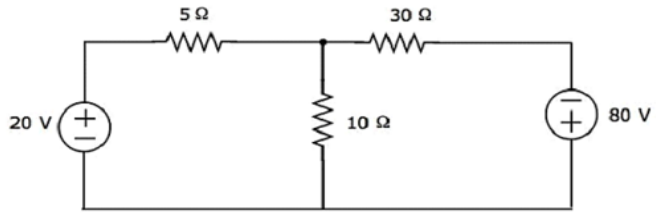
8. State and prove Superposition theorem.
9. State and prove Norton's theorem.
10. State and prove Thevenin's theorem.

SHORT ANSWER QUESTIONS

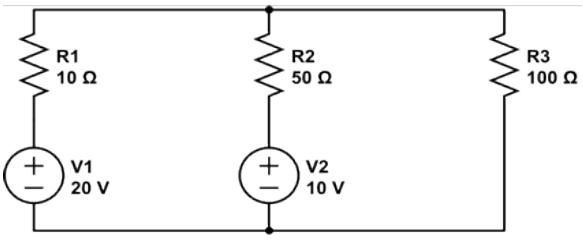
11. Explain Loop-current (mesh) method of analysis of electrical circuits.
12. What is Nodal analysis? Discuss node voltage method in anelectrical network.
13. State and proveMaximum power transfer theorem.
14. State and prove Reciprocity theorem.
15. State and prove Milliman's theorem.

PROBLEMS:

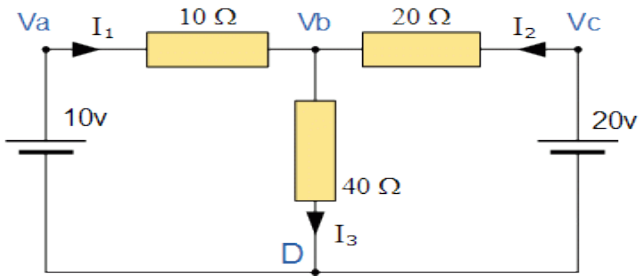
16. Find the mesh currentsI_1& I_2 using mesh analysis.



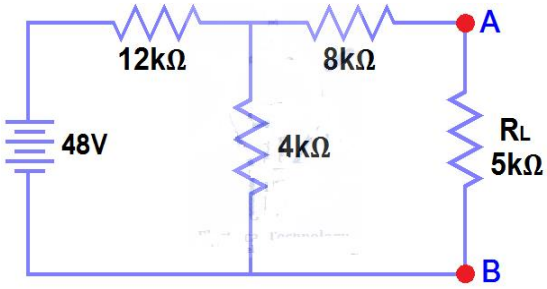
17. For the currents flowing through each loop using mesh analysis.



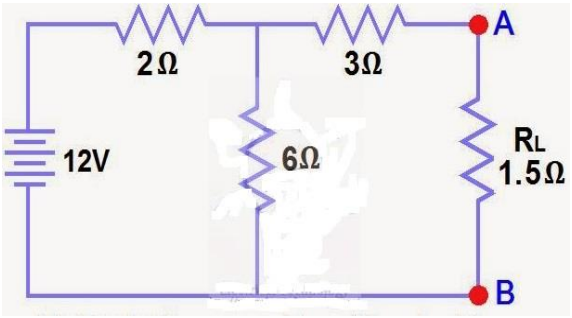
18. Calculate the total current I_3 using nodal analysis



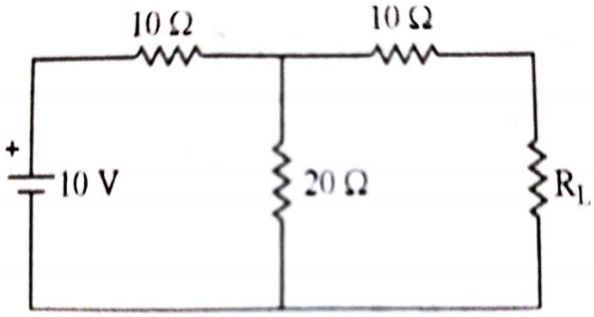
19. Calculate load current I_L using Thevenin's equivalent circuit.



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.



UNIT-III: RC AND RL CIRCUITS

ESSAY QUESTIONS

22. Discuss the frequency response of RC circuit for high pass filter circuit.
23. Discuss 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. Describe the working of RL circuits as differentiating network.
29. Describe the working of RL circuits as integrating network.
30. Discuss the frequency response of RL circuit for high pass filter circuit.
31. Discuss 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.

UNIT-IV: BJT, FET & UJT

ESSAY QUESTIONS

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

SHORT ANSWER QUESTIONS

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

PROBLEMS

44. For a transistor $\beta = 40$ and $I_B = 25$ μA. 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 volt between the bases. If the intrinsic stand off ratio is 0.6, find the value of stand off voltage and peak-point voltage.

UNIT-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.GOVERNMENT COLLEGE (A)

Electronics-Practical1 [Code: EL1202P]

Semester – I

Basic Circuit Theory

w.e.f. **2021-22**ADMITTED BATCH

2 Hours/Week[Total hours-30] **Credits:01**

Any **Five** experiments.

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

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

I B.Sc., Skill Development Course-Semester-1

W.e.f. 2020-21 ADMITTED BATCH

Electrical Appliances

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

UNIT-L (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

UNIT-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.

UNIT-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. 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. 5. Consumer Electronics. S.P.Bali. Pearson
6. Domestic appliances servicing. K.P. Anwer. Scholar institute publications

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

I B.Sc., Skill Development Course-Semester-1

W.E. F. 2020-21 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

Section	Questions to be given	Questions to be answered	Marks
A	6	3	3x10M=30M
B	7	4	4X5M =20M
Total	13	7	50M

Blue Print

Module	Essay Questions 10 Marks	Short Questions 5 Marks	Marks allotted
Unit – I	2	2	30
Unit – II	2	2	30
Unit – III	2	3	35
Total Marks			95

QUESTION BANK

SUBJECT: Electrical Appliances **SEMESTER : 1**

Essay Questions

UNIT - I

1. Give the principle of transformer and explain its working.
2. List out the differences between Galvanometer and Ammeter
3. What are electrical conductors and insulators? Give 2 examples for each

UNIT-2

4. Write a note on MCB.
5. Write about single phase and three phase power supplies? Explain
6. What do you mean by star and delta connections? Elaborate.

UNIT - 3

7. Identify various parts of an electric fan explain its working.
8. Explain the working of an electric iron box.
9. Explain various parts of an electric water heater.

Short Questions

UNIT - 1

10. Define voltage and current. Mention its units
11. What do you meant by capacitor? Write the expression for capacitors in series and parallel.
12. Write a note on Multi meter.

UNIT - 2

13. Differentiate AC and DC.
14. What is meant by electric shock? Explain first aid for electric shock.
15. Explain the concept of Earthing and write its necessity.
16. Explain how inverter works
17. Write a short note on UPS.

UNIT - 3

18. Write a note on induction heater.
19. Write the function of microwave oven
20. Identify different parts of Refrigerator.
21. Write the construction of LED
22. Explain the working of CFL bulb

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. I Year - Electronics – Semester – 2
PAPER – 2 [Code: EL2202]
w.e.f. 2021-22 ADMITTED BATCH

DIGITAL ELECTRONICS

4 Hours/Week [Total: 60 hrs.] **Credits: 3**

Aim and objectives of Course:

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

Learning Outcomes:

Students will be able to:

- Develop a digital logic and apply it to solve real life problems.
- Analyze, design and implement combinational logic circuits.
- Classify different semiconductor memories.
- Analyze, design and implement sequential logic circuits.
- Simulate and implement combinational and sequential logic circuits using VHDL

P.R.GOVERNMENT COLLEGE (A), KAKINADA
Electronics - Semester – II
Paper – 2 [Code: EL2202]
W.e.f. 2021-22 ADMITTED BATCH

Digital Electronics

4 Hours/Week [Total: 60 hrs.] **2021-22** **Credits: 3**

SYLLABUS

Unit – 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.

Unit- II (12hrs)
BOOLEAN ALGEBRA AND THEOREMS: Boolean Theorems, De-Morgan's laws. Digital logic gates, NAND & NOR as universal gates. Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh Map Method: 2,3 variables).

Unit-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.

UNIT-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.

UNIT-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 given by AKNU

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.(UNITS I to IV)
3. G.K.Kharate-Digital electronics-oxford universitypress
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. Malvino and Leach. " Digital Principles and Applications". TMG Hill Edition

P.R. GOVERNMENT COLLEGE (A), KAKINADA
Electronics - Semester – II
Paper – 2 [Code: EL2202]
w.e.f. 2021-22 ADMITTED BATCH

Digital Electronics

4 Hours/Week [Total: 60 hrs.] **2021 - 22** **Credits: 3**

MODEL QUESTION PAPER

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

Time: $2\frac{1}{2}$ 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

Chapter 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.

QUESTION BANK
DIGITAL ELECTRONICS

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

PROBLEMS

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

UNIT-II: - Boolean algebra and theorems:

ESSAY QUESTIONS

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

SHORT ANSWER QUESTIONS

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

PROBLEMS

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

UNIT-III: - Combinational Digital circuits:

ESSAY QUESTIONS

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

SHORT ANSWER QUESTIONS

23. Draw the circuit of parallel binary adder and explain the operation.
24. Explain Half subtractor by using truth table.
25. Explain Full subtractor by using truth table.
26. Write a note on Demultiplexers.
27. Explain 8-line-to-3-line Encoder.
28. Explain 3-line-to-8-line Decoder.
29. Explain CMOS Logic in brief with diagram in brief.

UNIT-IV: - Sequential Digital circuits:

ESSAY QUESTIONS

30. What is flip flop? Draw the circuit of J-K flip flop and discuss its working with the help of truth table.
31. What are Shift registers? Explain the construction and working of Serial-In-Serial-Out shift register.
32. What is a counter? Design and explain Mod-10 counter.

SHORT ANSWER QUESTIONS

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

UNIT-V: - Memory Devices:

ESSAY QUESTIONS

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

SHORT ANSWER QUESTIONS

43. Write a note on PROM
44. Describe briefly about EPROM.
45. Explain briefly about EERPOM.
46. Write a note on EAROM
47. Mention any 5 applications of memory device.

P.R.GOVERNMENT COLLEGE (A)
Electronics-Practical2 [Code: EL2202P]
Semester –2
w.e.f. 2021-22Admitted Batch

Electronic Devices and Circuits

2 Hours/Week[Total hours-30] **Credits:01**

Any **Five** experiments.

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. Verify the truth table Multiplexer and demultiplexer.
7. Verify the truth table Encoder and decoder.
8. Verify the truth table of RS , JK, T-F/F using NAND gates
9. 4-bit binary parallel adder and subtractor using IC 7483

P.R. GOVERNMENT COLLEGE (A),KAKINADA
B.Sc. II Year - Electronics – Semester – 3
PAPER – 3 [Code: EL3202]
w.e.f. 2020-21 ADMITTED BATCH

ANALOG CIRCUITS AND COMMUNINATION

4 Hours/Week [Total: 60 hrs.] **Credits: 3**

Aim and objectives of Course :

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

Learning Outcomes:

Students will be able to:

- Understand the fundamentals and areas of applications for the integrated circuits.
- Analyze important types of integrated circuits.
- Demonstrate the ability to design practical circuits that perform the desired operation.
- Select the appropriate integrated circuit modules to build a given application.
- Use of different modulation and demodulation techniques used in analog communication.
- Identify and solve basic communication problems.
- Analyze transmitters and receiver circuits

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. II Year - Electronics – Semester – 3
PAPER – 3 [Code: EL3202]
w.e.f. 2020-21 ADMITTED BATCH

ANALOG CIRCUITS AND COMMUNINATION

4 Hours/Week [Total: 60 hrs.] **Credits: 3**

SYLLABUS

Unit – I (12hrs)
OPERATIONAL AMPLIFIERS: Definition, 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.

Unit- II(12hrs)
OP-AMP CIRCUITS: voltage regulator, comparator, Schmitt trigger. sine wave generator, square wave generator, Active filters (Basics)-low pass, high pass filters IC-555 –functional block diagram and mention it's applications

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

UNIT-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.

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

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

TEXT BOOKS:
1. Op Amp and Linear Integrated Circuits By Ramakant Gaykwad
2. Linear Integrated Circuits ByRoyChoudary
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**

P.R. GOVERNMENT COLLEGE (A), KAKINADA

B.Sc. II Year - Electronics – Semester – 3

PAPER – 3 [Code: EL3202]

w.e.f. 2020-21 ADMITTED BATCH

ANALOG CIRCUITS AND COMMUNINATION

4 Hours/Week [Total: 60 hrs.] **Credits: 3**

MODEL QUESTION PAPER

Note: -Set the question paper as per the blue print given at the end of this model paper.

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

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Problems 5 marks	Marks allotted
1. OPERATIONAL AMPLIFIERS	2	1	1	**30**
2. OP-AMP CIRCUITS	1	2	1	**25**
3. AMPLITUDE MODULATION	1	2	1	**25**
4. FREQUENCY MODULATION	1	2	---	**20**
5. RADIO BROADCASTING AND RECEPTION	1	2	---	**20**
Total Marks				**120**

Note: At least two problems should be answered.

QUESTION BANK

ANALOG CIRCUITS AND COMMUNINATION

QUESTION BANK

UNIT-I: Operational Amplifiers

ESSAY QUESTIONS

1. Draw the circuit diagram of Inverting amplifier and explain its operation.
2. Draw the circuit diagram of Non inverting amplifier and explain its operation
3. Draw 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. Give 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. How does Op-Amp act as a 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. Find the output voltage, the input resistance and 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. Find the value of output voltage.
16. The input to the differentiator circuit is a sinusoidal voltage of peak value 5 mV and frequency 1 kHz. Find the output voltage if R= 10KΩ and C = 1μF.

UNIT-II: Op-Amp applications

ESSAY QUESTIONS

17. Discuss the working of Op- Amp as Series Voltage regulator.
18. Explain the construction and working of Schmitt trigger using Op-Amp.
19. Explain the pin diagram of Timer IC-555.

SHORT ANSWER TYPE QUESTIONS

20. Explain the working of Op-Amp as comparator.

21. Explain the construction and working of Sine wave generator (Wien's bridge) using Op-Amp.
22. Explain the construction and working of Square wave generator (Schmitt trigger) using Op-Amp.
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. Write the applications of IC 555 timer.

PROBLEMS

27. 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}
28. 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.
29. 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.

UNIT – 3 : Amplitude modulation

ESSAY QUESTIONS

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

SHORT ANSWER TYPE QUESTIONS

32. Explain Need for modulation.
33. Explain the frequency spectrum of AM wave.
34. Write a note on power relations in the AM wave.
35. Explain how AM waves are detected using diode.

PROBLEMS

36. 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.
37. 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. Find percent modulation.
38. The load current in the transmitting antenna of an unmodulated AM transmitter is 6amp. What will be the antenna current when modulation is 60%?
39. A carrier wave of 1000W is subjected to 100% modulation. Calculate:
    (1) Power of modulated wave
    (2) Power in USB
    (3) Power in LSB
40. In an amplitude modulated wave, the audio signal and carrier signal are given by 20 sin 2π (1500t) and 100 sin 2π (10^5t). Find the frequencies of signal and carrier wave and Percentage modulation.

UNIT – 4 : Frequency modulation

ESSAY QUESTIONS

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

SHORT ANSWER TYPE QUESTIONS

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

UNIT –5: Radio Broadcasting and Reception

ESSAY QUESTIONS

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

SHORT ANSWER TYPE QUESTIONS

51. Explain radio broadcasting and reception system
52. With the help of block diagram describe the working of transmitting antenna.
53. Describe the tuned radio frequency receiver with the help of block diagram.
54. Draw the block diagram of FM receiver. Explain each block.

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. II Year - Electronics – Practical – Semester – 3
PAPER – 3 [Code: EL3202]
w.e.f. 2020-21 ADMITTED BATCH

ANALOG CIRCUITS AND COMMUNINATION

2 Hours/Week[Total hours-30] **Credits:01**

Any **Five** experiments.

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

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. II Year - Electronics – Semester – 4
PAPER – 4 [Code: EL4202]
w.e.f. 2020-21 ADMITTED BATCH

MICROPROCESSOR SYSTEMS

4 Hours/Week [Total: 60 hrs] **Credits: 3**

Aim and objectives of Course:

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

Learning Outcomes:

Students will be able to:

- The student can gain good knowledge on microprocessor and implement in practical applications
- Design system using memory chips and peripheral chips for 16 bit 8086 microprocessor.
- Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors.
- Understand multi core processor and its advantages

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. II Year - Electronics – Semester – 4
PAPER – 4 [Code: EL4202]
w.e.f. 2020-21 ADMITTED BATCH

MICROPROCESSOR SYSTEMS

4 Hours/Week [Total: 60 hrs] **Credits: 3**

SYLLABUS

UNIT -I: (12 Hrs)
CPU ARCHITECTURE:

Introduction to Microprocessor, INTEL -8085 – Architecture of 8085 - 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.

UNIT -II: (12 Hrs)
8085 Instruction Set:

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

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

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

UNIT -IV: (12 Hrs)
8086:

Architecture of 8086, Register organization, Flag register, Addressing modes of 8086.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).

UNIT -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 given by AKNU

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

P.R. GOVERNMENT COLLEGE (A), KAKINADA

B.Sc. II Year - Electronics – Semester – 4

PAPER – 4 [Code: EL4202]

w.e.f. 2020-21 ADMITTED BATCH

MICROPROCESSOR SYSTEMS

4 Hours/Week [Total: 60 hrs] Credits: 3

Model Question Paper

Note: -Set the question paper as per the blue print given at the end of this model paper.

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

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Problems 5 marks	Marks allotted
CPU Architecture	2	2	---	30
8085 Instruction Set	1	3	---	25
Assembly Language Programming using 8085	1	---	2	20
8086	1	3	---	25
Arm Processor	1	2	---	20
Total Marks				120

QUESTION BANK

MICROPROCESSOR SYSTEMS

UNIT-I: CPU Architecture

ESSAY QUESTIONS

1. Draw the pin diagram of 8085 & explain each pin functioning.
2. Draw 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. Write a note on software, hardware, maskable and non-maskable interrupts in 8085.
6. Write a note on hardware interrupts.
7. Describe 8085 flag register.
8. Write a short note on Instruction formats.

UNIT-II: 8085 Instruction Set

ESSAY QUESTIONS

9. What are 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. What are increment and decrement group of instructions.
13. Describe any three logical group of operations
14. Explain DI & EI instructions
15. Write 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. Draw the Block diagram of Intel 8086 and explain each block.
25. Explain the addressing modes of 8086 with give examples.

26. Sketch the block diagram of USART (8251) and explain it.

SHORT QUESTIONS

27. Write a note on 8086 register organization.
28. Describe 8086 flag register.
29. Write a note on minimum mode configuration of 8086.
30. Write a note on maximum mode configuration of 8086.
31. Draw the block diagram of Keyboard and display(8279).
32. Draw the block diagram of DMA controller (8257).

UNIT-IV: ARM Processor

ESSAY QUESTIONS

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

SHORT QUESTIONS

35. What are the features of ARM processor?
36. Give the instruction set of ARM processor.

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. II Year - Electronics – Semester – 4
PAPER – 5 [Code: EL5202]
w.e.f. 2020-21 ADMITTED BATCH

MICRO CONTROLLER AND INTERFACING

4 Hours/Week [Total: 60 hrs] **Credits: 3**

Aim and objectives of Course:

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

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Learning Outcomes:

Students will be able to:

- The student can gain good knowledge on microcontrollers and implement in practical applications
- learn Interfacing of Microcontroller
- get familiar with real time operating system

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. II Year - Electronics – Semester – 4
PAPER – 5 [Code: EL4202]
w.e.f. 2020-21 ADMITTED BATCH

MICRO CONTROLLER AND INTERFACING

4 Hours/Week [Total: 60 hrs] **Credits: 3**

SYLLABUS

UNIT-I: (10Hrs)
Introduction, comparison of Microprocessor and micro controller, 8-bit and 16- bit Microcontrollers, Development tools for micro controllers, Assembler-Compiler-Simulator/Debugger.

UNIT -II: (10Hrs)
Microcontroller Architecture: Overview and block diagram 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.

UNIT-III:(10Hrs)
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,

Unit -IV: (15Hrs)
Assemble language programming Examples: Addition, Multiplication, Subtraction, division, arranging a given set of numbers in largest/smallest order.

UNIT-V : (15Hrs)
Interfacing and Application of Microcontroller: Interfacing of – PPI 8255, interfacing seven segment displays, displaying information on a LCD, control of a stepper Motor (Uni-Polar).

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 Gillispie Mazidi – Pearson Education Asia, 4th Reprint, 2002.

REFERENCE BOOKS:

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

4. Details of Lab/Practical/Experiments/Tutorials syllabus:

P.R. GOVERNMENT COLLEGE (A), KAKINADA

B.Sc. II Year - Electronics – Semester – 4

PAPER – 5 [Code: EL5202]

w.e.f. 2020-21 ADMITTED BATCH

MICRO CONTROLLER AND INTERFACING

4 Hours/Week [Total: 60 hrs] Credits: 3

Model Question Paper

Note: -Set the question paper as per the blue print given at the end of this model paper.

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

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Problems 5 marks	Marks allotted
CPU Architecture	2	2	---	30
8085 Instruction Set	1	3	---	25
Assembly Language Programming using 8085	1	---	2	20
8086	1	3	---	25
Arm Processor	1	2	---	20
Total Marks				120

QUESTION BANK

MICRO CONTROLLER AND INTERFACING

UNIT-I:

ESSAY QUESTIONS

1. Write the differences between Harvard and von-Neumann architectures.
2. Explain about 8-bit and 16- bit microcontrollers in detail.

SHORT QUESTIONS

3. Give the differences between microprocessor and micro controller.
4. Explain Harvard architecture.
5. Write about von-Neumann architecture.
6. Describe compiler and simulator/debugger in 8051.

UNIT-II:

ESSAY QUESTIONS

7. Draw the pin diagram of 8051 and explain each pin.
8. Draw the block diagram of 8051 and explain each block.
9. Explain program counter and memory organization in 8051.

SHORT QUESTIONS

10. Explain Data types in 8051
11. Write a note on directives in 8051.
12. Explain in detail PSW register in 8051.
13. Explain about interrupts in 8051.

UNIT-III:

ESSAY QUESTIONS

14. What are the Addressing modes present in 8051 and explain them?
15. How to access the memory using various addressing modes?
16. Write a note on timer/counter programming

SHORT QUESTIONS

17. Write a short note on jump, loop and call group of instructions.
18. Briefly explain Arithmetic group of instructions.
19. Write a note on Logical group of instructions.
20. What is Counter Programming in 8051?

UNIT-IV:

ESSAY QUESTIONS

21. Write an ALP to add two 16-bit numbers.
22. Write an ALP to subtract two 16-bit numbers.
23. Write an ALP to multiply two 16-bit numbers.
24. Write an ALP for arranging four 8-bit numbers in ascending order.
25. Write an ALP to divide two 16-bit numbers.

SHORT QUESTIONS

26. Write an ALP to add two 8-bit numbers.
27. Write an ALP to subtract two 8-bit numbers.
28. Write an ALP to multiply two 8-bit numbers.
29. Write an ALP for arranging four 8-bit numbers in descending order.
30. Write an ALP to divide two 8-bit numbers.

UNIT-IV:

ESSAY QUESTIONS

31. Draw and explain block diagram of 8255?
32. Write 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. Write a note on control word bits of 8255
36. Find the control byte for PA = IN, PB = OUT and PC = OUT
37. Draw a neat pin diagram of PPI 8255?
38. Write a note on control of stepper motor

P.R.GOVERNMENT COLLEGE (A)
Electronics-Practical4 [Code: EL4202P]
Semester –4
w.e.f. 2020-21 ADMITTED BATCH

Microprocessor Systems

2 Hours/Week[Total hours-30] **Credits:01**

Any **Five** experiments.

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. Largest number in the given array.
8. Smallest number in the given array.
9. Ascending order.
10. Descending order.

P.R.GOVERNMENT COLLEGE (A)
Electronics-Practical - 5 [Code: EL5202P]
Semester –4
w.e.f. 2020-21 ADMITTED BATCH

MICRO CONTROLLER AND INTERFACING

2 Hours/Week[Total hours-30] **Credits:01**

Any **Five** experiments.

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

P.R. GOVERNMENT COLLEGE (A), KAKINADA
II B.Sc., Physics – Semester - IV
2021 - 2022

Course Code : No. of credits : 02

Soldering & De-Soldering of Components

(Skill Development Course)

2 Hour/WeekTotal Hours : 30

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. http://spokentutorial.org/watch/KiCad/Designing+printed+circuit+board+in+KiCad/Hindi/2.
2. Principles of Reliable Soldering Techniques, Author R. Sengupta, Published by New Age International 3.
3. Surface Mount Technology: Principles and Practice by Ray P.Prasad, Published by Springer Science, 4.
4. Complete PCB Design Using OrCad Capture and Layout, Author Kraig Mitzner, Published by Newnes.

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2019-20 ADMITTED BATCH

PAPER – 5 [Code: EL5202]

MICROPROCESSORS (INTEL 8085)

3 Hours/Week [Total: 45 hrs] **Credits: 3**

Course Learning Outcomes

The subject aims:

- ✓ Knowledge of microcomputer and microprocessor
- ✓ Comprehension about Programming Examples
- ✓ Know the applications of Interfacing of devices
- ✓ Evaluate the Cycles
- ✓ Analysis of each Block

Learning Outcomes:

Students will be able to:

- ➢ Recall data and control buses.
- ➢ Recognize PIN configuration of 8085 and its description
- ➢ Observe classification of instructions
- ➢ Illustrate Interfacing of I/O devices
- ➢ Demonstrate Programmable peripheral device (8255)

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2019-20 ADMITTED BATCH

PAPER – 5 [Code: EL5202]

MICROPROCESSORS (INTEL 8085)

3 Hours/Week [Total: 45 hrs] **Credits: 3**

Syllabus

UNIT- I (10 hrs)

Architecture of 8085 Microprocessor (Online Mode)

Block diagram of Intel 8085-Register structure- multiplexing &Demultiplexing of address / data bus - Control Signal Generation and status signals - 8085 pin-out diagram & functions - Interrupts

Instruction set of 8085 -Instruction set classification - addressing modes

UNIT - II (8 hrs)

Memory:

Instruction cycle - machine cycle - T-state -Timing diagrams for Opcode Fetch Cycle, Memory Read, Memory Write, I/O Read, I/O Write.

UNIT- III (9 hrs)

Programming of 8085:

Addition &subtraction (8 – Bit & 16-bit), multiplication, division, largest, smallest (all 8-bit data), Ascending & Descending order (8 bit) - Stack & Subroutines (Concept only) - Debugging (concept).

UNIT- IV (9 hrs)

Interfacing Memory:

2K X 8 ROM, RAM to 8085interfacing, interfacing an I/O port in Memory Mapped I/O and I/O Mapped I/O - Difference between I/O mapped I/O and Memory Mapped I/O.

UNIT - V (9 hrs)

Microprocessor applications:

Programmable peripheral device (8255) - Block Diagram - Pin functions – Modes. 8279 - Architecture & block diagram – interfacing stepper motor with 8085.

TEXTBOOKS

1. Ramesh S. Gaonakar, Microprocessor Architecture, Programming and Application with the8085-PenramLnternational Publishing, Mumbai.

2. Ram, Fundamentals of microprocessors and microcomputers - Dhanpat Rai Publications, New Delhi

3. Microprocessors & Microcontrollers by N .Senthilkumar, M. Saravanan& S. Jeevananthan, 1st edition, Oxford press (Helpful for interfacing applications)

4. Microprocessors & Microcontrollers by B.P.Singh, Galgotia publications Pvt.Ltd.

REFERENCE BOOKS

1. Mathur A.P., Introduction to Microprocessors. (3rd edn, Tata McGraw, New Delhi,

2. Leventhal L.A., Microprocessor Organization and Architecture, Prentice Hall India.

3. Microprocessor lab premier by K.A.Krishnamurthy 1. Addition & Subtraction (8-bit)

2. Addition & Subtraction (16-bit)

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2019-20 ADMITTED BATCH

PAPER – 5 [Code: EL5202]

MICROPROCESSORS (INTEL 8085)

3 Hours/Week [Total: 45 hrs] **Credits: 3**

MODEL QUESTION PAPER

Note: - Set the question paper as per the blue print given at the end of this model paper.

TIME: 2 1/2Hrs 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

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Programs 5 marks	Marks allotted
Architecture of 8085 Microprocessor	2	2	---	30
Memory	1	2	---	20
Programming 8085	1	-	3	25
Interfacing memory	1	3	---	25
Microprocessor applications	1	2	---	20
Total Marks				120

PAPER – 5

SEMESTER - 5

MICROPROCESSORS (INTEL 8085)

QUESTION BANK

UNIT-I:Architecture of 8085 Microprocessor

ESSAY ANSWER TYPE QUESTIONS

37. Draw the pin diagram of 8085& explain each pin functioning.
38. Draw the Block diagram of Intel 8085 and explain each block.
39. Write in detail about Instruction set classification of 8085.
40. Write about the addressing modes of 8085 with give examples.

SHORT ANSWER TYPE QUESTIONS

41. Explain 8085 bus organization.
42. Write a note on software, hardware, maskable and non-maskable interrupts in 8085.
43. Write a note on hardware interrupts.
44. Write a short note on 8085 flag register.
45. Write a short note on Instruction formats.

UNIT-II: Memory

ESSAY ANSWER TYPE QUESTIONS

46. Draw the timing diagrams for Opcode Fetch Cycle and explain the process in detail.
47. Draw the timing diagram for Memory Read cycle,explain the procedure.
48. Draw the timing diagram for Memory Write cycle, explain the procedure.

SHORT ANSWER TYPE QUESTIONS

49. Draw the timing diagram for I/O Read cycle and explain the procedure.
50. Draw the timing diagram for I/O Write cycle and explain the procedure.
51. Write a note on Instruction cycle in 8085.
52. Write a note on Machine cyclein 8085& T-statein 8085.

UNIT-III: Programming of 8085

ESSAY ANSWER TYPE QUESTIONS

53. Explain about Stack & Subroutines in 8085.
54. Write a program on addition of two 16 bit numbers
55. Write a program on subtraction of two 16 bit numbers.
56. Write a program on 8 bit set of numbers in ascending order

PROGRAMMING

57. Write a program on subtraction of two 8-bit numbers.
58. Write a program on multiplication of two 8-bit numbers.
59. Write a program on addition of two 8 bit numbers.
60. Write a program on largest of set numbers each of 8-bit.
61. Write a program on Smallest of set numbers each of 8-bit.

UNIT-IV: Interfacing Memory

ESSAY ANSWER TYPE QUESTIONS

62. Explain 2K X 8 ROMto 8085 interfacing in detail
63. Explain 2K X 8 RAM to 8085 interfacing in detail.
64. Explain the concept of Memory mapped I/O and I/O mapped I/O.

SHORT ANSWER TYPE QUESTIONS

65. Explain about interfacing an I/O port in Memory Mapped I/O.
66. Explain about interfacing an I/O port in I/O Mapped I/O.
67. Write any 5 Differences between I/O mapped I/O and Memory Mapped I/O.

UNIT-V: Microprocessor applications

ESSAY ANSWER TYPE QUESTIONS

68. Draw and explain Block Diagram of 8255.
69. Draw the block diagram of 8279 and explain each block.
70. Explain about the interfacing of stepper motor with 8085.

SHORT ANSWER TYPE QUESTIONS

71. Write short note on modes of Programmable peripheral device (8255).
72. Write the control word of 8255 PPI
73. Draw the pin diagram of 8255.
74. Draw the pin diagram of 8279.

P.R.GOVERNMENT COLLEGE (A)
Electronics-Practical5 [Code: EL5202P]
w.e.f. 2019-20 ADMITTED BATCH

Semester –5
MICROPROCESSORS (INTEL 8085)

2 Hours/Week[Total hours-30] **Credits:02**

Any **Five** experiments.

1. Multiplication & Division (8 - bit)
2. Largest & Smallest number in the given array.
3. Ascending & Descending order.
4. Addition & subtraction(8 – Bit)
5. Addition & subtraction(16-bit)
6. Waveform generation using DAC interface.
7. Stepper motor interface.

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2019 -20 ADMITTED BATCH

PAPER – 6 [Code: EL6202]

ELECTRONIC COMMUNICATION SYSTEMS

3 Hours/Week [Total: 45 hrs] **Credits: 3**

Course Learning Outcomes

The subject aims:

- This course provides a thorough introduction to the basic principles and techniques used in analog and digital communications.
- The course will introduce analog and digital modulation techniques.
- Communication receiver and transmitter design, baseband and band pass communication techniques, line coding techniques, noise analysis, and multiplexing techniques.
- The course also introduces analytical techniques to evaluate the performance of communication systems.

Learning Outcomes:

Students will be able to:

- The student can gain good knowledge on analog and digital communication.
- Understand basic elements of a communication system.
- Conduct analysis of baseband signals in time domain and in frequency domain.
- Demonstrate understanding of various analog and digital modulation and demodulation techniques techniques.
- Analyse the performance of modulation and demodulation techniques in various transmission environments

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2019 **- 20** ADMITTED BATCH

PAPER – 6 [Code: EL6292]

ELECTRONIC COMMUNICATION SYSTEMS

3 Hours/Week [Total: 45 hrs] **Credits: 3**

Syllabus

UNIT –I (12Hrs)

MODULATION:

Amplitude modulation: Need for modulation, amplitude modulation-frequency spectrum of AM wave, representation of AM, power relations in the AM wave. Generation of AM – Diode modulators. Suppression of carrier, suppression of one side band- phase shift method.

Frequency modulation: Theory of FM, frequency spectrum of FM wave, narrow band FM, wide band FM, power contents of the carrier and sidebands, Generation of FM signals.

UNIT –II (7Hrs)

Basic receiver circuits: (Online Mode)

Super heterodyne Receiver block diagram, FM receiver, discriminators- slope, and balanced slope & Ratio detector

UNIT –III (10Hrs)

Radio wave propagation: Communication bands, Electromagnetic waves - properties and applications.

Pulse modulation: Introduction, Sampling theorem, PAM, PWM, PPM.

UNIT –VI (8Hrs)

Digital Communications:

Advantages of digital over analog communications. Advantages of shift keying over digital communication, Types of shift keying, ASK ,FSK.

Unit V (8 Hrs)

Cellular Mobile Communications:

Basic concept, frequency bands, SIM number, IMEI number, need for data encryption, block diagram of mobile communication network, idea of GSM, CDMA, and Technologies

TEXT BOOKS:

1. Electronic Communications - George Kennedy
2. Antennas and Wave Propagation – G.S.N.Raju – PHI
3. Principles of communication system –Herbert Taub & D.L.Schilling

REFERENCES:

1. Electronic Communications – Roody & Colen
2. Communication Systems – Hayken --- 4th Edition
3. Advance Electronic communication system ---Tomasi wayne
4. Modern digital and analog communication system –B.P.lathi

P.R. GOVERNMENT COLLEGE (A), KAKINADA

B.Sc. III Year - Electronics – Semester – V
w.e.f. 2019 - 20 ADMITTED BATCH
PAPER – 6 [Code: EL6202]
ELECTRONIC COMMUNICATION SYSTEMS

3 Hours/Week [Total: 45 hrs] **2018-2019Credits: 3**

Model Question Paper

Note: - Set the question paper as per the blue print given at the end of this model paper.

TIME: 2 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

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Programs 5 marks	Marks allotted
Modulation-I	1	2	2	30
Basic receiver circuits	2	2	---	30
Radio wave propagation	1	2	---	20
Digital communications	1	2	---	20
Cellular mobile communications	1	2	---	20
Total Marks				120

SEM-V

PAPER – 6

ELECTRONIC COMMUNICATION SYSTEMS

QUESTION BANK

UNIT-I

ESSAY QUESTIONS

1. Define amplitude modulation. Derive the equation of an AM wave.
2. Explain how AM waves are producedby using diode modulator.
3. Explain how AM side band is suppressed by using phase shift method.
4. Explain how FM waves are modulated by using Varactor diode method.

SHORT ANSWER QUESTIONS

5. Explain Need for modulation.
6. Explain Suppression of carrier wave (DSBSC) of AM wave.
7. Write a note on power relations in the AM wave.
8. Obtain equation of FM wave
9. Write a note on narrow band and wide band of FM.
10. Write a note on power relations in the FM wave.

PROBLEMS

11. 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.
12. 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. Find percent modulation.
13. The load current in the transmitting antenna of an unmodulated AM transmitter is 6amp. What will be the antenna current when modulation is 60%?
14. A carrier wave of 1000W is subjected to 100% modulation. Calculate:
    (1) Power of modulated wave
    (2) Power in USB
    (3) Power in LSB
15. In an amplitude modulated wave, the audio signal and carrier signal are given by 20 sin 2π (1500t) and 100 sin 2π (10^5t). Find the frequencies of signal and carrier wave and Percentage modulation.

UNIT-II

ESSAY QUESTIONS

16. Draw Superheterodyne Receiver block diagram and explain each block.
17. Explain reception of FM waves using Ratio detector.

SHORT ANSWER QUESTIONS

18. Explain reception of FM waves using Slope detector.
19. Explain reception of FM waves using Balanced slope detector.

UNIT-III

ESSAY QUESTIONS

20. State and prove sampling theorem
21. Explain Pulse amplitude modulation technique.
22. Explain Pulse width modulation technique.

SHORT ANSWER QUESTIONS

23. Write a short note on communication bands.
24. Write the properties of Electromagnetic waves.
25. Write the applications of Electromagnetic waves.

UNIT-IV

ESSAY QUESTIONS

26. Explain the procedure of Amplitude shift keying.
27. Explain the procedure of Frequency shift keying.

SHORT ANSWER QUESTIONS

28. Write the advantages of digital over analog communications.
29. Write the advantages of shift keying over digital communication.

UNIT-V

ESSAY QUESTIONS

30. Draw and explain the block diagram of mobile communication network.
31. Write a note on frequency bands.
32. Write a note on GSM & CDMA technologies.

SHORT ANSWER QUESTIONS

33. Write a note on SIM number.
34. Write a note on IMEI number.
35. Explain need for data encryption.

P.R.GOVERNMENT COLLEGE (A)
Electronics-Practical6 [Code: EL6202P]
w.e.f. 2019-20 ADMITTED BATCH

Semester – 5
ELECTRONIC COMMUNICATION SYSTEMS

2 Hours/Week[Total hours-30] **Credits:02**

Any **Five** experiments.

1. Pulse Amplitude Modulation(PAM) circuit and study its wave forms
2. Pulse Width Modulation(PWM) circuit and study its wave forms
3. Pulse Position Modulation(PPM) circuit and study its wave forms
4. Pulse Code Modulation(PCM) circuit and study its wave forms
5. Modulation of LED and detection through Photo detector.
6. Pre-emphasis circuit
7. De-emphasis circuit
8. Amplitude modulation (simulation experiment also)

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – VI
w.e.f. 2019 - 20 ADMITTED BATCH

PAPER – 7 A [Elective - A]
MICRO CONTROLLER AND INTERFACING

3 Hours/Week [Total: 45 hrs] **Credits: 3**

Course Learning Outcomes

The subject aims:

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

Learning Outcomes:

Students will be able to:

- The student can gain good knowledge on microcontrollers and implement in practical applications
- Learn Interfacing of Microcontroller
- Get familiar with real time operating system

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2019 - 20 ADMITTED BATCH

PAPER – 7 A [Elective - A]

MICRO CONTROLLER AND INTERFACING

3 Hours/Week [Total: 45 hrs] **Credits: 3**

Syllabus

UNIT-I: (6Hrs)

Introduction, comparison of Microprocessor and micro controller, 8-bit and 16- bit Microcontrollers, Harvard and Von-Neumann Architectures, Assembler-Compiler-Simulator/Debugger.

UNIT -II: (12Hrs) **(Online Mode)**

Microcontroller Architecture:

Block diagram 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.

UNIT-III :(9Hrs)

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,

Unit -IV: (9 Hrs)

Programming:

Assemble language programming Examples: Addition, Multiplication, Subtraction, division, arranging a given set of numbers in largest/smallest order.

UNIT-V:(9 Hrs)

Data communication:

Serial Communication – basics of serial communication, Half and Full duplex transmission, Asynchronous Serial Communication and framing, Data communication classification.8051 Serial Communication programming. 8051 Interrupts. Interrupt priority in the 8051.

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 Gillispie Mazidi – Pearson Education Asia, 4th Reprint, 2002.

REFERENCE BOOKS:

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

P.R. GOVERNMENT COLLEGE (A), KAKINADA
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Elective PAPER – 7 A
Elective A - MICRO CONTROLLER AND INTERFACING

3 Hours/Week [Total: 45 hrs] Credits: 3

Model Question Paper

Note: - Set the question paper as per the blue print given at the end of this model paper.

TIME: 2 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

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Programs 5 marks	Marks allotted
Introduction	1	2	---	20
Microcontroller Architecture	2	2	---	30
Addressing modes, instruction set of 8051	1	2	2	30
Programming	1	--	2	20
Data communication	1	2	---	20
Total Marks				**120**

PAPER – 7 A [Elective - A]
MICRO CONTROLLER AND INTERFACING
QUESTION BANK

ESSAY ANSWER TYPE QUESTIONS

UNIT-I: Introduction to 8051

39. Give the differences between microprocessor and micro controller.
40. Write the differences between Harvard and von-Neumann architectures.
41. Write a short note on assembler, compiler and simulator/debugger in 8051.
42. Explain about 8-bit and 16- bit microcontrollers in detail with 2 examples.

UNIT-II:Microcontroller Architecture

1. Draw and explain the architecture of 8051.
2. Draw the pin diagram of 8051 and explain each pin.
3. Describe in detail about PSW register, register banks and stack in 8051.
4. Draw the block diagram of 8051 and explain each block.
5. Explain program counter and memory organization, data types and directives in 8051.

UNIT-III:Addressing modes, instruction set of 8051

1. Write about addressing modes and accessing memory using various addressing modes in 8051.
2. Explain instruction set and their usage in 8051.
3. Explain in detail about timer/counter programming in 8051.

UNIT-IV:Programming

1. Explain addition, multiplication, subtraction, division each with an example.
2. Write a program on largest of any four 16-bit numbers.
3. Explain in detail about assemble language programming and give some examples.

UNIT-V: Data communication

1. Draw and explain block diagram of serial communication in 8051.
2. Write about half and full duplex transmission, asynchronous serial communication and framing.
3. Explain in detail about 8051 Interrupts. Interrupt priority in the 8051.
4. Write about Data communication classification and Serial Communication programming in 8051.

SHORT ANSWER TYPE QUESTIONS

UNIT-I: Introduction to 8051

1. Explain 8-bit and 16- bit Microcontrollers in 8051.
2. Explain Harvard architecture.
3. Write about von-Neumann architecture.
4. Describe compiler and simulator/debugger in 8051.

UNIT-II:Microcontroller Architecture

1. Draw the Architecture of 8051.
2. Explain Data types and directives.
3. Explain in detail PSW register.
4. Draw the pin diagram of 8051.
5. Explain about interrupts in 8051.

UNIT-III:Addressing modes, instruction set of 8051

1. What are the Addressing modes present in 8051 and explain them?
2. How to access the memory using various addressing modes?
3. Explain the jump, loop and call instructions.
4. What is Counter Programming in 8051?

UNIT-V: Data communication

1. Draw the block diagram of serial communication in 8051.
2. Explain SCON register and mode classification in it.
3. What is Half and Full duplex transmission? Give some examples.
4. Explain Data communication in 8051.
5. How interrupt priority takes place in 8051.

PROGRAMMING:

UNIT-III:Addressing modes, instruction set of 8051

1. Write a program on largest of an array of four 8-bit numbers.
2. Write a program on smallest of an array of four 8-bit numbers.
3. Write a program on subtraction of two 8-bit numbers.
4. Write a program on moving of data between registers using addressing modes of 8051.

UNIT-IV:Programming

1. Write a program on addition of two 16-bit numbers.
2. Write a program on multiplication on two 8-bit numbers.
3. Write a program on arranging four 8-bit numbers in ascending order.
4. Write a program on division of two 8-bit numbers.

P.R.GOVERNMENT COLLEGE (A)
Electronics-Practical7A [Elective A]
w.e.f. 2019-20 ADMITTED BATCH

Semester –6
MICRO CONTROLLER AND INTERFACING

2 Hours/Week[Total hours-30] **Credits:02**

Any **Five** experiments.

1. Addition and subtraction of two 8-bit numbers.
2. Multiplication and division of two 8-bit numbers.
3. Addition of two 8-bit numbers
4. Addition of two 16-bt numbers
5. Subtraction of two 8-bit numbers
6. Subtraction of two 16-bit numbers.
7. Multiplication of two 8-bit numbers
8. Program to find the largest number in given array
9. Program to find the smallest number in given array

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PAPER – 7 B [Elective B]
PC MAINTAINANCE AND TROUBLE SHOOTING

3 Hours/Week [Total: 45 hrs]Credits: 3

Course Learning Outcomes

The subject aims:

- **Introduction to Computers**.
- To **trouble shoot various components like Keyboard, Mouse and add on cards**.
- To understand the operation of **Storage devices**
- To understand the operation of **SMPS**
- To understand the operation of **Monitor**
- To understand the operation of **Printers**
- To **Prevent maintenance**

Learning Outcomes:

Students will be able to:

- The student can gain good knowledge on various electronic appliances.
- Learn Interfacing of Various components of computer.
- Learn about Software installation.
- Learn about Hardware identification.

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2019-20 ADMITTED BATCH

PAPER – 7 B [Elective B]

PC MAINTAINANCE AND TROUBLE SHOOTING

3 Hours/Week [Total: 45 hrs]Credits: 3

SYLLABUS

UNIT – I: 9 Hrs

Introduction to Computers:

Block diagram & types of computers. Mother Board Characteristics, choosing a Motherboard, Installing a Mother board, Upgrading system BIOS. Bus Slots – ISA, MCA, EISA, PCI, USB and firmware (IEEE 1394). Features and comparison of 80286, 80386 and 80486, Characteristics of Pentium MMX, Comparison of Pentium-2 with all other processors. Dual core, core 2 duos, quad, P4, P4HT, I3, I5, I7 processors.

UNIT – II: 9Hrs

Basic trouble shooting:

Introduction about proper tools in system maintenance, various test equipment for PC servicing, Reasons for failure of resistor, Reasons for failure of capacitor, Reasons for failure of other components, Safety precautions during trouble shooting.

Keyboard: Types of keyboards block diagram of keyboard, keyboard connectors. reasons for failure of keyboard.

Mouse: Working and components of mouse and different connectors.

Add on cards: MDA, CGA, VGA, Sound card, NIC card, SCSI Controller and FDC and HDC.

UNIT – III: 9Hrs

Storage devices:

Introduction about disk drives, Characteristics of different disk drives

FDD: - Different types, working and components of drives.

HDD:-Different types, working and components of HDD drives partitioning & Formatting HDD

CDROM: - Different types working and components of CDROM drives.

DVD: - Different types, working and components of DVD.

Reasons for failure of disk drives

UNIT –IV: 9Hrs

SMPS: linear, AT, ATX, Block of SMPS and description of each block. INTRODUCTION to UPS& SPS: Reasons for power supply failure, Impact of power supply failure on PC.

Monitor: Introduction about display units, Different display technologies, block diagram, Reasons for display failure.

UNIT – V: 9Hrs

Printers: - Different types of printers, dot matrix, INKJET & LASER PRINTER – components and working.

Preventive maintenance– Effect of heat and noise, Effect of corrosion on PC, Effect of power fluctuations, Effect of magnetic fields on system performance, EMI effect, Virus protection, Tools and techniques of S/W trouble shooting.

TEXT BOOKS:

1. UPGRADING AND REPAIRING PC – Scott Muller.
2. IBM PC and Clones: Hardware, Troubleshooting and Maintenance - Govindarajalu. B

REFERNCE BOOKS:

1. I.T. HARDWARE - NATSHELL.
2. PRINTER MANUALS.

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2019-20 ADMITTED BATCH

PAPER – 7 B [Elective B]

PC MAINTAINANCE AND TROUBLE SHOOTING

3 Hours/Week [Total: 45 hrs]Credits: 3

Model Question Paper

Note: - Set the question paper as per the blue print given at the end of this model paper.

TIME: 2 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

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Marks allotted
Introduction to computers	2	2	30
Basic trouble shooting	1	3	25
Storage devices	1	3	25
Smps &monitor	1	2	20
Printers & preventive maintenance	1	2	20
Total marks			120

P.R.GOVERNMENT COLLEGE (A)
Electronics-Practical7B [Elective B]
Semester –6
w.e.f. 2019-20 ADMITTED BATCH

PC MAINTENANCE AND TROUBLE SHOOTING

2 Hours/Week[Total hours-30] **Credits:02**

Any **Five** experiments.

1. Identification of different peripherals and components in a PC.
2. Identification of different types of motherboards.
3. Identification of different expansion slots and add-on cards.
4. Assembling a PC.
5. Study of CMOS ROM BIOS setup utilities.
6. Change of CMOS password and boot sequence.
7. Connecting hard drives, floppy drives and DVD writer.
8. Creating partitions and formatting a hard drive.
9. Installation of windows 2000 Professional and windows XP.
10. Installation of application software's and antivirus software.
11. Installation of windows server 2003.
12. Installation and configuring display sound and LAN cards.

P.R.GOVERNMENT COLLEGE (A)
Electronics-Practical7B [Elective B]
Semester –6

w.e.f. 2019-20 ADMITTED BATCH

PC MAINTENANCE AND TROUBLE SHOOTING

2 Hours/Week[Total hours-30] **Credits:02**

Any **Five** experiments.

1. Identification of different peripherals and components in a PC.
2. Identification of different types of motherboards.
3. Identification of different expansion slots and add-on cards.
4. Assembling a PC.
5. Study of CMOS ROM BIOS setup utilities.
6. Change of CMOS password and boot sequence.
7. Connecting hard drives, floppy drives and DVD writer.
8. Creating partitions and formatting a hard drive.
9. Installation of windows 2000 Professional and windows XP.
10. Installation of application software's and antivirus software.
11. Installation of windows server 2003.
12. Installation and configuring display sound and LAN cards.

P.R.GOVERNMENT COLLEGE (A)
Electronics-Practical8 A 1 [Cluster Elective A1]
w.e.f. 2019-20 ADMITTED BATCH

Semester –6
POWER ELECTRONICS

2 Hours/Week[Total hours-30] **Credits:02**

Any **Five** experiments.

1. Study of I-V characteristics of DIAC
2. Study of I-V characteristics of a TRIAC
3. Study of I-V characteristics of a SCR
4. SCR as a half wave and fullwave rectifier switch R and RL loads
5. DC motor control using SCR.
6. Study of parallel and bridge inverter.
7. Design of snubber circuit
8. V-I Characteristic of IGBT
9. Study of chopper circuits

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – VI
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PAPER – 8A2 [Cluster Elective A 2]
CONSUMER ELECTRONICS

3 Hours/Week [Total: 45 hrs]Credits: 3

Course Learning Outcomes

The subject aims:

- To understand the operation of Micro wave oven.
- To understand the operation ofWashing machines.
- To understand the operation of Air conditioners
- To understand the operation of Refrigerators
- To understand the operation of Xerox copier
- To understand the operation of Digital calculator
- To understand the operation of Digital clocks
- To understand the operation of Digital access devices like Barcode Scanner, ATM's, digital cable TV etc

Learning Outcomes:

Students will be able to:

- The student can gain good knowledge on various electronic appliances.
- Learn Interfacing of Various components of electronic appliances.
- Get familiar with real time operating system.
- Learn about power ratings of electronic appliances
- Learn about different types of digital access devices.

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2019-20 ADMITTED BATCH

PAPER – 8 A 2 [Cluster Elective A2]

CONSUMER ELECTRONICS

3 Hours/Week [Total: 45 hrs]Credits: 3

SYLLABUS

UNIT-I (9hrs)

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.

UNIT-II (9hrs)

Washing Machines:

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

UNIT-III (9hrs)

Air Conditioners and Refrigerators: (Online Mode)

Air Conditioning - Components of air conditioning systems -All water air conditioning systems - All air conditioning systems - Unitary and central air conditioning systems -Split air conditioners.

UNIT-IV (9 hrs)

Home/Office Digital Devices:

Facsimile machine - Xerographic copier -Calculators - Structure of a calculator - Internal Organization of a calculator - Digital clock - Block diagram of a digital clock.

UNIT-V (9hrs)

Digital access devices:

Digital computer -Internet access - Barcode Scanner and decoder - Electronic Fund Transfer - Automated Teller Machines (ATMs) - Set-Top boxes - Digital cable TV - Video on demand.

Suggested Books:

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

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PAPER – 8 A 2 [Cluster Elective A2]
CONSUMER ELECTRONICS
3 Hours/Week [Total: 45 hrs]Credits: 3

Model Question Paper

Note: - Set the question paper as per the blue print given at the end of this model paper.

TIME: 2 1/2Hrs 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

Chapter 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

PAPER – 8 A2 [Cluster Elective A 2]

CONSUMER ELECTRONICS

ESSAY QUESTIONS

UNIT- I

1. Draw and explain the Microwave oven block diagram.
2. Draw and explain the LCD timer with alarm.
3. Draw and explain Single-Chip Controllers.

UNIT- II

1. Explain the block diagram of Electronic controller for washing machines.
2. Explain Washing machine hardware and software.
3. Explain Fuzzy logic washing machines.

UNIT- III

1. Explain Components of air conditioning systems.
2. Explain All water air conditioning systems.
3. Explain All air conditioning systems.

UNIT- IV

1. Explain the Calculators and Structure of a calculator
2. Explain Internal Organization of a calculator.
3. Explain the Block diagram of a digital clock.

UNIT- V

1. Draw and explain Digital computer
2. Discuss the Barcode Scanner and decoder.
3. Explain Internet access

PAPER – 8 A 2 [Cluster Elective A 2]

CONSUMER ELECTRONICS

SHORT ANSWER TYPE QUESTIONS

UNIT- I

1. Explain Types of Microwave oven.
2. Explain Wiring and Safety instructions of microwave oven.
3. Explain Care and Cleaning.

UNIT- II

1. Explain Types of washing machines.
2. Explain Features of washing machines.

UNIT- III

1. Explain Unitary and central air conditioning systems
2. Explain Split air conditioners.

UNIT- IV

1. Explain Xerographic copier.
2. Explain Facsimile machine
3. Explain Digital clock.

UNIT- V

1. Explain Electronic Fund Transfer.
2. Explain Automated Teller Machines (ATMs).
3. Explain Set-Top boxes.
4. Explain Digital cable TV and Video on demand.

P.R.GOVERNMENT COLLEGE (A)
Electronics-Practical8 A 2 [Cluster Elective A2]
w.e.f. 2019-20 ADMITTED BATCH

Semester –6
CONSUMER ELECTRONICS

2 Hours/Week[Total hours-30] **Credits:02**

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

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PAPER – 8A3 [Cluster Elective A 3]
EMBEDDED SYSTEMS DESIGN

3 Hours/Week [Total: 45 hrs] **Credits: 3**

Course Learning Outcomes

The subject aims:

- Design embedded computer system hardware.
- Design, implement, and debug multi-threaded application software that operates under real-time constraints on embedded computer systems.
- Use and describe the implementation of a real-time operating system on an embedded computer system.
- 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.
- Create computer software and hardware implementations that operate according to well-known standards.
- Organize and write design documents and project reports.
- Organize and make technical presentations that describe a design.

Learning Outcomes:

Students will be able to:

- The student can gain good knowledge on Embedded Systems and implement in practical applications.
- To study advanced communication principles.
- An ability effectively as a member or leader on a technical team
- A commitment to quality, timeliness and continuous improvement

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2019-20 ADMITTED BATCH

PAPER – 8 A 3 [Cluster Elective A 3]

EMBEDDED SYSTEMS DESIGN

3 Hours/Week [Total: 45 hrs] **Credits: 3**

SYLLABUS

UNIT - 1: (7 Hrs)

Introduction to Embedded Systems:

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

UNIT - 2: (11 Hrs)

Custom Single Purpose Processor – Hardware Development:

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

UNIT - 3: (11 Hrs)

General Purpose Processor – Software Development: (Online Mode)

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.

UNIT - 4: (8 Hrs)

RTWA for Embedded Systems:

Introduction, Pulse Width Modulators, LCD Controllers, Keypad Controllers, Stepper Motor Controllers, Analog – to – Digital Converters, and Real Time Clocks.

UNIT -5: (8 Hrs)

Advanced Communication Principles:

Parallel Communication, Serial Communication, Wireless Communication, **Serial Protocols:** CAN and USB. **Parallel Protocols:** PCI BUS and ARM BUS. **Wireless Protocols:** 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.

REFERENCES:

1. An Embedded Software Premier - **David E- Siman**, PEARSON Education
2. 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 Wesly**, 1991

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w.e.f. 2019-20 ADMITTED BATCH
PAPER – 8 A 3 [Cluster Elective A 3]
EMBEDDED SYSTEMS DESIGN
3 Hours/Week [Total: 45 hrs] **Credits: 3**

Model Question Paper

Note: - Set the question paper as per the blue print given at the end of this model paper.

TIME: 2 1/2Hrs 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

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Marks allotted
Introduction to Embedded Systems	2	2	30
Custom Single Purpose Processor – Hardware Development	1	2	20
General Purpose Processor – Software Development	1	3	25
RTWA for Embedded Systems	1	3	25
Advanced Communication Principles	1	2	20
Total marks			120

PAPER – 8 A 3 [Cluster Elective A 3]
EMBEDDED SYSTEMS DESIGN

ESSAY QUESTIONS

UNIT- I: -Introduction to Embedded Systems:

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

UNIT- II: - Custom Single Purpose Processor – Hardware Development:

1. Explain Custom Single Purpose Processor Design
2. Explain RT-Level Custom Single-Purpose Processor.

UNIT- III: - General Purpose Processor – Software Development:

1. Explain Host and Target Machines.
2. Explain Linker / Locators for Embedded Software.
3. Explain Getting Embedded Software into the target system.

UNIT- IV: - RTWA for Embedded Systems:

1. Explain Analog – to – Digital Converters.
2. Explain and Real Time Clocks.

UNIT -5: Advanced Communication Principles:

1. What is communication? Explain Parallel Communication.
2. What is communication? Explain Serial Communication.
3. Describe communication and write about Wireless

PAPER – 8 A 3 [Cluster Elective A 3]
EMBEDDED SYSTEMS DESIGN

SHORT ANSWER TYPE QUESTIONS

UNIT- I: - Introduction to Embedded Systems:

1. Explain Processor Technology,
2. Explain IC Technology, and Design Technology.

UNIT- II: - Custom Single Purpose Processor – Hardware Development:

1. Explain Combinational logic.
2. Explain Sequential logic.

UNIT- III: - General Purpose Processor – Software Development:

1. Explain Basic Architecture and Operation.
2. Explain Programmer's View.
3. Explain ASIPs.

UNIT- IV: - RTWA for Embedded Systems:

1. Explain Pulse Width Modulators.
2. Explain LCD Controllers.
3. Explain Keypad Controllers
4. Explain Stepper Motor Controllers,

UNIT -V: Advanced Communication Principles:

1. Give brief explanation of Protocol and about Serial protocol of CAN.
2. Give brief explanation of Protocol and about Serial protocol of USB.
3. Give brief explanation of Protocol and about Parallel protocol PCI BUS.
4. Give brief explanation of Protocol and about Parallel protocol ARM BUS.
5. What is wireless protocol and explain any one of them.
6. Explain Bluetooth.
7. Explain IEEE 802.11.

P.R.GOVERNMENT

COLLEGE (A)

Electronics-Practical8 A 3[Cluster Elective A 3]

Semester –6

w.e.f. 2019-20 ADMITTED BATCH

EMBEDDED SYSTEMS DESIGN

2 Hours/Week[Total hours-30] **Credits : 02**

PROJECT WORK-VIII

STUDENTS HAS TO DO A GROUP PROJECT WORK DURING THIRD YEAR

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – VI
w.e.f. 2019-20 ADMITTED BATCH

PAPER – 8B1 [Cluster Elective B 1]
COMPUTER NETWORKS

3 Hours/Week [Total: 45 hrs] **Credits: 3**

Course Learning Outcomes

The subject aims:

- To understand Network models.
- To understand Physical layer.
- To understand Medium Access Sub Layer.
- To understand Network Layer.
- To understand Transport Layer.
- To understand Application Layer.

Learning Outcomes:

Students will be able to:

- The student can gain good knowledge on various Network models.
- Learn about Interfacing of Various Layers.
- Get familiar with different types of Layers.

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2019-20 ADMITTED BATCH

PAPER – 8 B1 [Cluster Elective B 1]

COMPUTER NETWORKS

3 Hours/Week [Total: 45 hrs] **Credits: 3**

SYLLABUS

UNIT-I: 9 Hrs

Introduction:

Introduction to OSI,TCP/IP and other Network models,Examples of Networks,NovelNetworks,Arpanet,Internet,Networktopologies,WAN,LAN,MAN.

Physical Layer:Transmitted media copper,twistedpairwireless,switching and encoding asynchronouscommunications,Narrowband,Broadband,ISDN& ATM.

UNIT-II: 9 Hrs

Data Link Layer:

Design issues,framing,error detection &correction,CRC,elementary protocol-Stop and wait, Slidingwindow,slip,data link layer in HDLC,Internet,and ATM.

UNIT-III: 9 Hrs

Medium Access Sub Layer:

ALOHA,MAC,Address,Carrier sense multiple access,IEEE 802.X standard Ethernet,WirelessLAN,Bridges.

UNIT-IV: 9 Hrs

Network Layer:

Virtual circuits and data gram sub nets-routing algorithm,shortest path routing,fooding,Hierarchicalrouting,broadcast,multicast,distance vector routing

UNIT-V: 9 Hrs

Transport Layer: Transport services,Connection management, TCP& UDP protocols,ATM AAL layers protocol

Application Layer: Network security, domain name system,SNMP,Electronicmail,the world web,multimedia

TEXT BOOKS:

1. Computer Networks - Andrew S. Tanenbaum,4thEdition,Pearson education
2. Data communications & Networking -Behrouz A.Forouzan.3rdEditionTMH

References

1. An engineering approach to Computer Networks - S. Kesav 2ndEdition,Pearson education

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2019-20 ADMITTED BATCH

PAPER – 8 B1 [Cluster Elective B 1]

COMPUTER NETWORKS

3 Hours/Week [Total: 45 hrs] **Credits: 3**

Model Question Paper

Note: - Set the question paper as per the blue print given at the end of this model paper.

TIME: 2 1/2Hrs 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

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Marks allotted
Unit - 1	2	2	30
Unit – 2	1	2	20
Unit – 3	1	2	20
Unit – 4	1	3	25
Unit – 5	1	3	25
Total marks			120

P.R.GOVERNMENT COLLEGE (A)
Electronics-Practical8 B1 [Cluster Elective B1]
w.e.f. 2019-20 ADMITTED BATCH

Semester –6
COMPUTER NETWORKS

2 Hours/Week[Total hours-30] **Credits:02**

Any four Activities should be done

1. Study of different types of network cables and practically implement the cross wired cable and straight through cable using clamping tool.
2. Study of network Devices in detail.
3. Study of network IP
4. Connect the computers in local area network
5. Study of basic network command and network configuration command
6. Configure a network topology using packet tracer software
7. Configure a network using link state vector routing protocol

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – VI
w.e.f. 2019-20 ADMITTED BATCH

PAPER – 8B2 [Cluster Elective B 2]
ELECTRONIC INSTRUMENTATION

3 Hours/Week [Total: 45 hrs] **Credits: 3**

Course Learning Outcomes

The subject aims:

- To introduce students to monitor, analyze and control any physical system.
- To understand students how different types of meters work and their construction.
- To Study of absolute is merely confirmed within laboratories.
- To Study integrating instruments like ammeter, voltmeter.
- To Measurement of impedance using bridges.
- To Study of PLL ,ph-meter, PLC

Learning Outcomes:

Students will be able to:

- Design a system, component or process to meet desired needs in electrical engineering.
- Measurement of R, L, C, Voltage, Current, Power factor, Power, Energy.
- Ability to balance Bridges to find unknown values.
- Ability to measure frequency, phase with Oscilloscope.
- Ability to use Digital voltmeters.
- Ability to measure strain, displacement, Velocity, Angular Velocity, temperature, Pressure, Vacuum, and Flow.

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2019-20 ADMITTED BATCH

PAPER – 8 B 2 [Cluster Elective B 2]

ELECTRONIC INSTRUMENTATION

3 Hours/Week [Total: 45 hrs] **Credits: 3**

SYLLABUS

UNIT-I (7hrs)

Measurements:

Basic block diagram of measurement system, Accuracy and precision, resolution, sensitivity, linearity, Errors, systematic and random errors, standards &calibrations of an instrument. Applications of instrument.

UNIT –II (9hrs)

Basic Measurement Instruments:

DC measurement-ammeter, voltmeter, ohm meter, AC measurement, Digital voltmeter systems (integrating and non-integrating). Digital MultiMate; Block diagram principle of measurement of I, V, C. Accuracy and resolution of measurement.

Measurement of Impedance: A.C. bridges, Measurement of Self Inductance (Anderson's bridge), Measurement of Capacitance (De SautyBridge), Measurement of frequency (Wien's bridge).

UNIT-III(11hrs)

Lock-in-amplifier:

Basic Principles of phase locked loop (PLL), Phase detector (XOR& edge triggered), Voltage Controlled Oscillator (Basics, varactor), lock and capture. Basic idea of PLL IC (565 or 4046). Lock-in-amplifier, Idea of techniques for sum and averaging of signals.

Signal Generators: Function generator, Pulse Generator, (Qualitative only).

UNIT-IV (11 hrs)

Analytical instruments

Spectrophotometer, working with block diagram, features of spectrophotometer,

PH meter - principle working with block diagram, features of **PH** meter.

Temperature Transducers: Standards and calibration, Fluid expansion and metal expansion type transducers, like bimetallic strip, Thermometer, RTD, Thermo couple and their characteristics.

UNIT-V: (7 hrs)

Direct digital control (DDC), Distributed control system (DCS),

PLC'S: Block diagram**,** hardware, PLC operation, basic logic program (ladder logic), Applications of PLC'S

TEXT BOOKS

1. Introduction to instrumentation and control ByA.K.Ghosh
2. Sensors and transducers PHI 2Ed ByD.Patranabis.
3. Industrial instrumentation –Eckman.P.
4. Instrument measurement analysis By Nakra and chaudhry.

Reference Books:

1. W.D. Cooper and A. D. Helfrick, Electronic Instrumentation and Measurement Techniques, Prentice Hall (2005).
2. E.O. Doebelin, Measurement Systems: Application and Design, McGraw Hill Book - fifth Edition (2003).
3. David A. Bell, Electronic Devices and Circuits, Oxford University Press (2015).
4. Alan S. Morris, "Measurement and Instrumentation Principles", Elsevier (Butterworth Heinmann-2008).

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2019-20 ADMITTED BATCH

PAPER – 8 B 2 [Cluster Elective B 2]

ELECTRONIC INSTRUMENTATION

3 Hours/Week [Total: 45 hrs] **Credits: 3**

Model Question Paper

Note: - Set the question paper as per the blue print given at the end of this model paper.

TIME: 3 Hrs Max Marks: 70

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

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Marks allotted
Measurements	1	3	25
Basic Measurement Instruments	1	2	20
Lock-In-Amplifier & Signal Generators	2	2	30
Analytical Instruments & Temperature Transducers	1	3	25
Control Systems	1	2	20
Total marks			120

P.R.GOVERNMENT COLLEGE (A)
Electronics-Practical8 B2 [Cluster Elective B2]
w.e.f. 2019-20 ADMITTED BATCH

Semester –6
COMPUTER NETWORKS

2 Hours/Week[Total hours-30] **Credits : 02**

Any **Five** experiments.

1. Design of multi range ammeter and voltmeter using galvanometer.
2. Measurement of resistance by Wheatstone bridge and measurement of bridge sensitivity.
3. Measurement of Capacitance by De'Sautys.
4. Measure of low resistance by Kelvin's double bridge.
5. To determine the Characteristics of resistance transducer - Strain Gauge (Measurement of Strain using half and full bridge)
6. To determine the Characteristics of LVDT.
7. To determine the Characteristics of Thermistors and RTD.
8. Measurement of temperature by Thermocouples and study of transducers like AD590 (two terminal temperature sensor), PT-100, J- type, K-type.

To study the Characteristics of LDR, Photodiode, and

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – VI
W.e.f. 2019-20 ADMITTED BATCH
PAPER – 8B3 [Cluster Elective B 3]
OPTICAL FIBER COMMUNICATION AND IT'S APPLICATION
3 Hours/Week [Total: 45 hrs]Credits: 3

Course Learning Outcomes

The subject aims:

- To study about the concept of fiber optic communication.
- To study light source and detectors.
- To study the different types of fiber measurements.
- To study the concept of link design.
- Introduction to fiber optic communication Receiver.
- To study about fiber optic measurement.
- To study about Optic Fiber Sensors and applications.

Learning Outcomes:

Students will be able to:

- This course provides the students with the basic understanding of the concepts and principles of optical fiber communications.
- Line transmission systems - analog and digital transmission system standards.
- On completion of the course, the students will be able to apply the knowledge and principles leant to analyze, design, install and manage typical wired and wireless communication systems and networks

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – VI
W.e.f. 2019-20 ADMITTED BATCH
PAPER – 8 B 3 [Cluster Elective B3]
OPTICAL FIBER COMMUNICATION AND IT'S APPLICATION
3 Hours/Week [Total: 45 hrs] Credits: 3

SYLLABUS

UNIT - I: (8 Hrs)
Fiber optic communication:

The basic communications systems, Nature of light, Advantages of fiber, Applications of fiber optic communications, Light wave fundamentals- Electromagnetic waves, Dispersion, Pulse distortion and information rate, polarization, Resonant cavities, Reflection at a plane boundary, Critical – angle Reflections ; Optic fiber waveguides: - Step-index fiber, Graded-index fiber, Attenuation. (Elementary Treatment only).

UNIT - II: (8 Hrs)
Light source and detectors:

Light emitting diodes Operating characteristics, Laser diodes, Laser diode operating characteristics, Distributed feedback laser diode, Optical amplifiers, Light detectors: Principles of photo detection, Photo multiplier, Semi conductor photo diode, PIN photo diode, Avalanche photo diode.

UNIT - III: (11 Hrs)
MODULATION:

Light Emitting Diode Modulation and circuits, Laser diode modulation and circuits, Analog Modulation Format, Digital modulations formats. **SYSTEM LINK DESIGN:** Analog system design, Digital system design, power budget analysis.

UNIT - IV: (11 Hrs)
Optical Fiber Communication Receiver:

Introduction: Signal Path through Optical Data link, Receiver configuration with noise, Receiver noises, Noise at the input to the Amplifier, Receiver Capacitance and Bandwidth, Block diagram of Optical Receiver, Automatic Gain Control (AGC) circuit.

Fiber Optical Measurement: Introduction: Attenuation Measurement, Optical Time Domain Reflecto-meter (OTDR), Time Domain Dispersion Measurement, Frequency Domain Dispersion Measurements, Numerical Aperture Measurement using Scanning photo detector, measurement of losses in Splice and Connectors.

UNIT - V: (7 Hrs)
Fiber Optical Sensors and Applications:

Fiber Optic Sensor: Generalised Optical Fiber sensors, Phase and Polarization Fiber sensor, Optical Fluid Level Detector, Optical Fiber Flow Sensors, Optical Displacement sensors, Long haul communications, Local Area Networks.

TEXT BOOKS:

1. Fiber Optic Communications by Joseph C.Palais (4th Edition, Pearson Education)

2. **Opto-electronics and Fiber Optic communications by C.K.Sarkar and D.C.Samkar**
3. **Fiber Optic Communications by S.Sankar. (New age international)**

REFERENCE BOOKS:

1. Fiber Optic communication by senior-PHI
2. Fiber Optic communications Technology – Djafark.Mynbaev, Lowell L. Scheiner.
3. Opticalfiber communication-Gerd Kaiser
4. Optical communication system-John Gowar.

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

W.e.f. 2019-20 ADMITTED BATCH

PAPER – 8 B 3 [Cluster Elective B 3]

OPTICAL FIBER COMMUNICATION AND IT'S APPLICATION

3 Hours/Week [Total: 45 hrs] Credits: 3

Model Question Paper

Note: - Set the question paper as per the blue print given at the end of this model paper.

TIME: 2 1/2Hrs 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

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Marks allotted
Fiber Optic Communication	1	3	25
Light Source And Detectors	1	3	25
Modulation	1	2	20
Optical Fiber Communication Receiver	2	2	30
Fiber Optical Sensors AndApplications	1	2	20
Total marks			120

P.R.GOVERNMENT COLLEGE (A)
Electronics-Practical8 B3 [Cluster Elective B3]
w.e.f. 2019-20 ADMITTED BATCH
Semester –6
OPTICAL FIBER COMMUNICATION AND IT'S APPLICATION

2 Hours/Week[Total hours-30] **Credits:02**

Any **Five** experiments.

1. SETTING FIBER OPTIC ANALOG LINK
2. SETTING FIBER OPTIC DIGITAL LINK
3. STUDY OF LOSSES IN OPTICAL FIBER
4. BENDING LOSSES IN FIBER
5. STUDY OF NUMERICAL APERTURE OF OPTICAL FIBER
6. STUDY OF CHARACTERISTICS OF FIBER OPTIC LED.
7. STUDY OF TIME DIVISION MUTIPLEXING (DIGITAL)

P.R. GOVERNMENT COLLEGE (A), KAKINADA

DEPARTMENT OF ELECTRONICS

WORK LOAD FOR THE YEAR 2021-22

Name of the Subject : ELECTRONICS

Total No. of Hours : **104**

	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	III MPE Sem V Paper V	3	2	2	4	7
8	30	III MPE Sem V Paper VI	3	2	2	4	7
9	30	III MECS Sem V Paper V	3	2	2	4	7
10	30	III MECS Sem V Paper VI	3	2	2	4	7
11	30	Cluster Sem VI Paper VII A	3	2	2	4	7
12	30	Cluster Sem VI Paper VIII A	3	2	2	4	7
13	30	Cluster Sem VI Paper VIII B	3	2	2	4	7
14	30	Cluster Sem VI Paper VIII C	3	2	2	4	7
15							
		Total Work load for the department of ELECTRONICS					**104**

P.R. GOVERNMENT COLLEGE (A), KAKINADA

DEPARTMENT OF PHYSICS & ELECTRONICS

WORK LOAD FOR THE YEAR 2021-22

WORK LOAD For Re-Structured Courses For the Year 2021-22

ODD SEMESTER

Name of the Subject : ELECTRONICS

Total No. of Hours : **46**

S. No	Strength	Name of the class	Theory hours	Practical Hours	No. of Batches	Total Practical Hours	Total hrs. (Theory + Practical)
	30	I MECS	4	2	2	4	8
	30	I MEiot	4	2	2	4	8
	30	II MECS	4	2	2	4	8
	30	II MEiot	4	2	2	4	8
	30	III MECS Sem V Paper V	3	2	2	4	7
	30	III MECS Sem V Paper VI	3	2	2	4	7
		Total Work load					**46**

WORK LOAD For Re-Structured Courses For the Year 2021-22

EVEN SEMESTER

Name of the Subject : ELECTRONICS

Total No. of Hours : **60**

S. No	Strength	Name of the class	Theory hours	Practical Hours	No. of Batches	Total Practical Hours	Total hrs. (Theory + Practical)
	30	I MECS	4	2	2	4	8
	30	I MEiot	4	2	2	4	8
	30	II MECS	4	2	2	4	8
	30	II MEiot	4	2	2	4	8

	30	Elective Sem VI Paper VII A	3	3	2	4	7
	30	Cluster Sem VI Paper VIII A	3	3	2	4	7
	30	Cluster Sem VI Paper VIII B	3	3	2	4	7
	30	Cluster Sem VI Paper VIII C	3	3	2	4	7
		Total Work load					**60**

WORK LOAD For Conventional Courses For the Year 2021-22

ODD SEMESTERS

Name of the Subject : ELECTRONICS

Total No. of Hours : **30**

	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 V	3	2	2	4	7
4	30	III MPE Sem V Paper VI	3	2	2	4	7
		Total Work load					**30**

WORK LOAD For Conventional Courses For the Year 2021-22

EVEN SEMESTERS

Name of the Subject : ELECTRONICS

Total No. of Hours : **44**

	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	Elective Sem VI Paper VII A	3	2	2	4	7
4	30	Cluster Sem VI Paper VIII A	3	2	2	4	7
5	30	Cluster Sem VI Paper VIII B	3	2	2	4	7
6	30	Cluster Sem VI Paper VIII C	3	2	2	4	7
		Total Work load for the DEPARTMENT of ELECTRONICS					**44**

LIST OF EXAMINERS / PAPER SETTERS IN ELECTRONICS

2020 – 21

S.No.	Name of the examiner	Subject	Name of the College
1	Ch.Kanakarao 9848943943	Electronics	Y.N.College, Narsapur
2.	S.Venkataraju 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	M/s 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.Veerabhadra 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	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	Government college, Yeleswaram
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 Electronics

Departmental Activities Planned for 2021-2022

The department of Physics and Electronics is planning the following programmes to conduct for the academic year 2021-2022

S. No.	Activity	Probable date	Remarks
1	Post admission test, Student Counseling Discussion on Result Analysis	Oct4th week	
2	Sensitization on Departmental Activities particularly on Kasarabada Scholarship and Endowment Prizes	Oct4th week	
3	Disbursement of Kasarabada Scholarship both for UG and PG	Nov 2nd week	
4	Celebration of Sir C.V.Raman's Birth day Guest lecture - 1	November 7th	
5	Inaugural function of Photon club, International Online Webnar	Nov3rdweek	
6	Launching Upkar Scheme	Nov4thweek	
7	Extension activity to local high schools	Dec 2nd week	
8	Awareness programme on IMD	Dec3rd week	
9	Guest Lecture -2	Jan 1st week	
10	Study Area Programme	Jan4th week	
11	Parent Teacher Meeting	Feb 1stweek	
13	Workshop / Intercollegiate Science Competitions	February 2nd week	
14	Student Counseling before commencement of semester end exams	Feb 4th week	
15	National Science day celebrations	February 28th	
16	Guest Lecture - 3	Mar 2nd week	
17	Student Counseling after commencement of semester end exams	April4th week	

18	Online Quiz programme	May 2nd week	
19	College level Chess Competition	June3rdweek	
20	Guest Lecture - 4	July 1st week	
21	Observing Hiroshima Day	August 1st week	
22	UPKAR scheme – Disbursement of money to the students	August 2nd week	

Certificate

The syllabus and model question papers including **Blue – Print** in Electronics subject for 3 years B.Sc. course for the semester I,II,III,IV,V and VI for the academic year **2021-22**, list of examiners and paper setters, departmental activities which contains pages 101,102& 103and is approved in the Board of Studies meeting held on **12 –11- 2022**.

Members of Board of Studies			Signatures of members
1	K. Jayadev	Chair person	
2	P. Paul Diwakar	University nominee, Lecturer in Electronics,	
3	Sri D. Gangadharudu	Subject Expert, Lecturer in Electronics/ Physics ,Government degree college, Yeleswaram	
4	K. Venkateswara rao	Local Nominee, Lec.in Phy/Electronics, ASD College (A), Kakinada	
5	Sri B. Sudarshan	Representative from Industry, Andhra Electronics, kakinada	
6	Dr. S.V.G.V.A. Prasad	Member	
7	P. Himakar	Member	
8	Sri. B. Srikanth	Member	
9	D. Sravani	Member	
10	D. Nagini, III MPE	Student Member	
11	A Bhuvaneswari, III MECs	Student Member	
12	P. G. S. Teja, III MECs	Student Member	
13	Ch. Kesava Ram, I MPE	Student Member	

From

K. Jayadev
In-charge
Department of Electronics
P.R.Govt. College (A),
Kakinada.

To

The Principal,
P.R.Govt. College (A),
Kakinada.

Sir,

SUB: Submission of the bills for BOS meetings for the Electronics–Reimbursement of Amount--request – Reg.

I hereby submit __ vouchers\bills (Electronics -)for an amount of
Rs. -(Electronics – Rs. /-)which was spent by me for BOS meetings in Electronics on. Iam here with enclosing a statement showing the said expenditure for your kind perusal.

S. No.	Subject	Expenditure	To be reimbursed
1	Electronics		
2			
3			
4			
TOTAL			

Thanking you Sir

Yours faithfully,

STATEMENT FOR EXPENDITURE

Electronics BOS Bills

S.No.	Voucher no./Bill no.	Description	Amount
1			
2			
3			
4			
5			
6			
7			