P.R. GOVERNMENT COLLEGE, KAKINADA

AN AUTONOMOUSE COLLEGE WITH NAAC "A" GRADE

DEPARTMENT
OF
PHYSICS AND ELECTRONICS

Board of Studies

Electronics

2019 - 2020

P.R. Government College (A), Kakinada

Department of Physics and Electronics

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P.R. Government College (Autonomous), Kakinada

Department of Physics and Electronics

AGENDA FOR BOARD OF STUDIES IN ELECTRONICS

4th April 2019

Discuss and Approve

1. Syllabi for 5^{th} and 6^{th} semesters.
2. Question Bank and Blue Print.
3. Panel of Question Paper Setters and Examiners.
4. Internal to External exams to be assessed in the ratio 40:60 for all First, Second and third years
5. Split up for Continuous Comprehensive Evaluation (CCE)
6. Utilization of funds under various heads
7. Department Action plan for 2019-20
8. Any other proposal with the permission of the chair

P.R. Government College (Autonomous), Kakinada

Department of Physics and Electronics

RESOLUTIONS BOARD OF STUDIES MEETING OF ELECTRONICS

4th April 2019

1. It is resolved to continue to offer two Electives in VI semester for the present academic year 2019 – 20 as done in the previous year ie., 2018-19. The student has to choose one of the two electives.
   VII A Micro Controller and Interfacing
   VII B PC Maintenance and Trouble Shooting as paper

2. It is resolved to offer two Cluster 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 Project work

   Cluster Elective B
   VIII B1 Computer Networks
   VIII B2 Electronic Instrumentation
   VIII B3 Project work

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 2019 - 20

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 2019 – 20. Out of the two one would be an online examination for 20 Marks and another would be theoretical for 20 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, 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 2019-20.

12. Resolved to approve funds allocated under various heads

Sl. No	Purpose	Projected Amount
1	Board of Studies	5,000/-
2	Invited Lectures	12,000/-
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		**4,97,000/-**

P.R. GOVERNMENT COLLEGE(A), KAKINADA

Department of Physics & Electronics

Aims

- Provide students with a sound base of knowledge and understanding of Electronics principles, to expose them to the applications of these principles in a broad range of areas and to allow them to study some of these in depth.
- Provide students with comprehensive training in laboratory techniques and handling of experimental apparatus, data analysis and interpretation, and the communication of results.
- Foster students' development of transferable and personal skills, including those of problem-solving, analysis, independent learning, team-working, which will be essential to their future careers.
- To support teaching and learning with well-equipped Simulation laboratory.
- Equip students for employment in a broad range of disciplines, particularly those which value numerate graduates who can apply their knowledge and problem-solving skills to real-world situations.

Objectives

At the end of the course the students would be exposed to

- Ψ To have knowledge of basics of AC fundamentals, Network theorems, Resonance.
- Ψ To have comprehensive knowledge of P-N Junction, Bipolar Junction Transistor.
- Ψ To know the Advantages of FET .
- Ψ Familiarity with the Power supply, RC coupled amplifier, Operational amplifiers .
- Ψ To have knowledge of feedback and Oscillators.
- Ψ To know the applications of Op-Amps.
- Ψ To understand about communication.
- Ψ To improve knowledge in Digital Electronics.
- Ψ To have fundamentals of Micro computer and Microprocessor.
- Ψ To understand about Microcontrollers
- Ψ To have fundamentals in Embedded systems and its Applications.

S. No.	Semester	PAPER	Course Code	Course	Hours/Week	Hours/Sem	Max. Marks	No. of Credits	Course Credits
1	I	PAPER – 1	EL1202	Basic circuit theory	04	60	60 + 40	3	3
2	I	Practical – 1	EL1202 P	Basic circuit theory	03	30	50	2	2
3	II	PAPER – 2	EL2202	Electronic Devices and Circuits	04	60	60 + 40	3	3
4	II	Practical – 2	EL2202 P	Electronic Devices and Circuits	03	30	50	2	2
5	III	PAPER – 3	EL3202	Digital electronics	04	60	60 + 40	3	3
6	III	Practical – 3	EL3202 p	Digital electronics	03	30	50	2	2
7	IV	PAPER – 4	EL4202	OP – AMP & Digital IC-applications	04	60	60 + 40	3	3
8	IV	Practical – 4	EL4202 P	OP – AMP & Digital IC-applications	03	30	50	2	2
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			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		Power Electronics	03	45	100	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	100	3	3
28	VI	Practical VIII (B) - 3		Optical Fiber Communication / Project	03	30	50	2	2
Total Credits 50									

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Abstract of Course Wise Allocation of Credits

College : P.R. Government College (A), Kakinada **2019 – 20** **Course : B.Sc.**
Subject : Electronics

Department of Physics & Electronics

P.R. Government College (A), Kakinada
Blue print for the model paper – Electronics
Semester End External examination
For I, II &III year core courses
2019 – 2020

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	5	10	50	3	10	30
2	Section – B Short answer Question	9	5	45	6	5	30
TOTAL				**95**			**60**

Percentage of Choice given $= \frac{95-60}{95} \; x \; 100$

$= \frac{35}{95} \; x \; 100 \qquad = 36.8\,\%$

P.R. Government College (A), Kakinada

Blue Print for Internal Theory Examination

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

S. No.	Type of question	No. of Questions Given			No. of Questions to be answered		
		No. of Questions	Marks allotted To each question	Total marks	No. of Questions	Marks allotted To each question	Total marks
1	**Section – A** Essay question	2	10	20	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: 3 hrs 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 PHYSICS & ELECTRONICS

ADDITIONS AND DELETIONS IN THE III YEAR

Subject : Electronics

Paper – V Topics Added			
S. No.	Name of the Unit	Topics added	Justification
1	Unit III	Largest number of an array using 16 bit number	To extend programming on Arrarys
Paper – V Topics Deleted			
	Name of the Unit	Topics Deleted	Justification
2	Unit V	1. Online Ticket Reservation 2. Functions and Networks	1. Not feasible 2. Too lengthy to teach as a topic in the chapter.

P.R.GOVERNMENT COLLEGE (A), KAKINADA
Electronics-Semester –1
Paper - 1[Code: EL1202]
w.e.f. 2019-20 ADMITTED BATCH

Basic Circuit Theory

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

Course Learning Outcomes

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

1. Students will demonstrate the ability to evaluate the parameters of basic electronic components (wires, resistors, capacitors, diodes etc.) based on their physical parameters and dimensions.

2. **Students will reliably demonstrate the ability to solve basic DC circuits using Kirchhoff's current and voltage laws.**

3. **Students will reliably demonstrate 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:EL1202]
w.e.f. 2019-20 ADMITTED BATCH

Basic Circuit Theory

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

Syllabus

UNIT- 1: (12 hrs)
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, A.C through pure R, L & C elements.

UNIT-II: (12 hrs)
Passive networks: (D.C)

Kirchhoff's current and Voltage Law's, Resistor, Capacitor and Inductor - series and parallel networks. Mesh Analysis, Nodal Analysis, star to delta and delta to star conversions.

UNIT-III: (12 hrs)
Networks theorems: (D.C)

Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power, Milliman and Reciprocity theorems.

UNIT-IV: (15 hrs)
RC and RL circuits**:**

Transient response of RC and RL circuits with dc input, Time constants, Frequency response of RC and RL circuits their action as low pass, high pass. Passive differentiating and integrating circuits.

UNIT-V: (9 hrs)
Series and Parallel resonance circuits**:**

LCR Series resonance and parallel resonance circuits, Q - Factor, Selectivity and band width, Comparison of series and parallel resonance.

Reference Books:

1. Grob's Basic Electronics - Mitchel E.Schultz 10th Edn. Tata McGraw Hill (TMH)
2. Network lines and fields- Ryder- Prentice Hall of India (PHI)
3. Circuit analysis - P.Gnanasivam- Pearson Education
4. Circuits and Networks - A.Sudhaksr & Shyammohan S. Palli - TMH
5. Network Theory - Smarajit Ghosh - PHI

6. Electronic Devices and Circuits-Millman and Halkias - TMH
7. Electronic Devices and Circuits-Allen Mottershead - PHI
8. Principles of Electronics- V.K. Mehta and Rohit Mehta - S Chand &Co
9. Electronic Devices and Circuit Theory- R.L.Boylestad and L.Nashelsky- Pearson Education.
10. Pulse digital switching waveforms -Millman &Taub - TMH.
11. Applied Electronics- R.S.Sedha - S Chand &Co
12. A First course in Electronics- AA Khan & KK Day- PHI
13. Principles of Electronic circuits- Stanely G.Burns and Paul R. Bond- Galgotia.
14. Electronic Principles and Applications – A.B. Bhattacharya- New Central Book Agency Pvt.
15. Basic Electronics D.C. Tayal
16. Basic Electronics Grobb
17. Electrical Technology II B.L. Thereja & A.K. Thereja
18. Electronics Ryder
19. Hand book of Electronics Gupta & Kumar
20. Unified Electronics Vol 1 & 2 Arora

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P.R.GOVERNMENT COLLEGE (A), KAKINADA
Electronics-Semester –1
Paper – 1 [Code: EL1202]
w.e.f. 2019-20 ADMITTED BATCH

Basic Circuit Theory

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

MODEL QUESTION PAPER

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

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

Section	Questions to be given	Questions to be answered	Marks
A	5	3	3 x 10M = 30M
B	9	6	6 x 5 M = 30M
Total	14	9	60M

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	1	1	1	20
Network theorems	1	1	1	20
RC and RL Circuits	1	1	1	20
Series and Parallel resonance circuits	1	1	1	20
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) Peak Value (b) Average value (C) RMS value.
2. What is a phasor? Explain phasor notation. Describe how phasors are used to represent sinusoidal waveforms.

SHORT ANSWER QUESTIONS

1. Define Current and Voltage and write the relation between them.
2. Distinguish between A.C. and D.C.
3. Discuss A.C. circuit containing pure Resistance only.
4. Discuss A.C. circuit containing pure Capacitance only.
5. Discuss A.C. circuit containing pure Inductance only.

UNIT-II: PASSIVE NETWORKS
ESSAY QUESTIONS

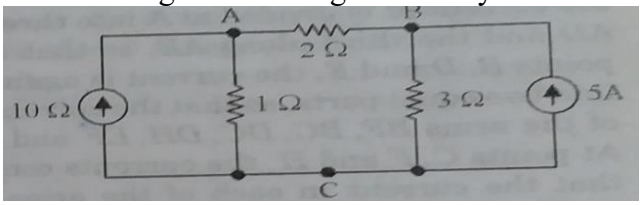
1. State and prove Kirchhoff's Voltage law and Kirchhoff's Current law.
2. Explain Loop-current (mesh) method of analysis of electrical circuits.

SHORT ANSWER QUESTIONS

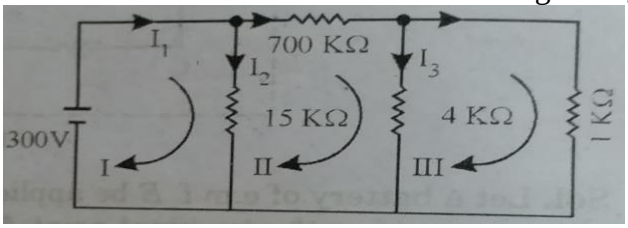
1. What is Nodal analysis? Discuss node voltage method in a electrical network
2. Explain star to delta conversion with suitable example.
3. Explain delta to star conversion with suitable example.

PROBLEMS:

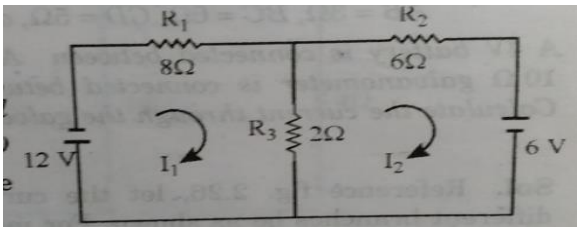
1. Find the current through '3 Ω' using node analysis.



2. For the circuit shown below find the current flowing through the voltage source.



3. For the circuit given in figure, find the current through R_1 by the method of mesh currents.



UNIT-III: NETWORKS THEOREMS
ESSAY QUESTIONS

1. State and prove superposition theorem.
2. State and prove Norton's theorem.

SHORT ANSWER QUESTIONS

1. State and prove Thevenin's theorem.
2. State and prove Maximum power transfer theorem.
3. State and prove Reciprocity theorem.

PROBLEMS:

1. Using the super position theorem, find the voltage across R_2 in the circuit shown below.

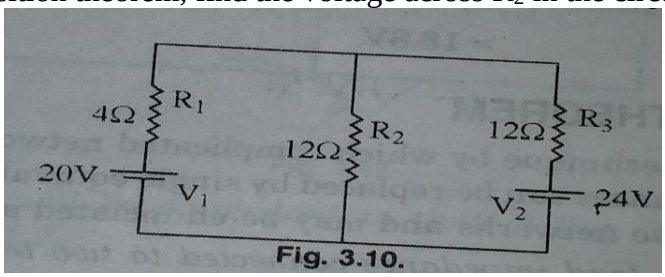
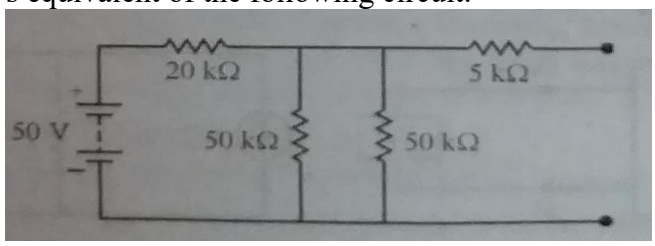
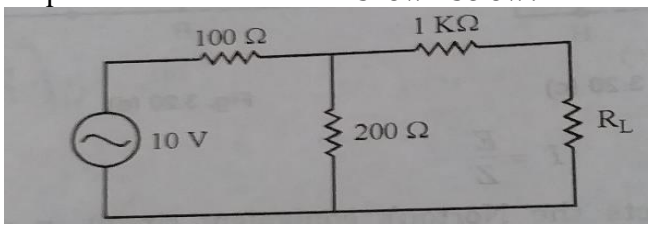


Fig. 3.10.

2. Show the Thevenin's equivalent of the following circuit.



3. What is the Norton's equivalent to the network shown below?



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

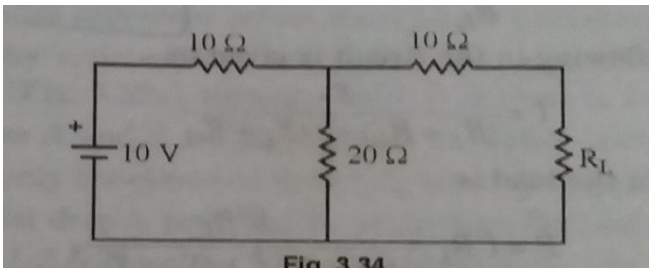


Fig. 3.34

UNIT-IV: RC AND RL CIRCUITS

ESSAY QUESTIONS

1. Discuss the transient response of RL circuit containing DC sources.
2. Discuss the transient response of RC circuit containing DC sources.

SHORT ANSWER QUESTIONS

1. Describe the working of RC circuits as differentiating and integrating networks.
2. Describe the working of RL circuits as differentiating and integrating networks.
3. Discuss the frequency response of RC circuit for high pass filter circuit.
4. Discuss the frequency response of RC circuit for low pass filter circuit.

PROBLEMS:

1. A capacitor of capacity 0.5 μf and resistance 10 MΩ is charged to a potential difference of 10 volts. Find the time constant and the maximum charge stored.
2. A capacitor is being charged from a D.C. source through a resistance of 2MΩ. If it takes 0.5 second for the charge to reach three-quarters of its final values, find the capacity of the capacitor.
3. 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.
4. A charged condenser of capacity 4μf is shunted by a high resistance. If half the charge leaks through in 50 seconds, calculate its resistance.

UNIT-V: SERIES AND PARALLEL RESONANCE CIRCUITS

ESSAY QUESTIONS

1. Deduce an expression for resonant frequency of Series RLC circuit.
2. Deduce an expression for resonant frequency of Parallel RLC circuit.

SHORT ANSWER QUESTIONS

1. Distinguish between Series resonance and Parallel resonance.
2. Define Q – factor? Calculate Q- factor of an LCR series resonant circuit.
3. Define Q – factor? Calculate Q- factor of an LCR parallel resonant circuit.

PROBLEMS

1. A series RLC ccircuit has R =5 Ω, L=40mH and C=1μF. calculate i) the resonant frequency, ii) the Q of the circuit, iii) bandwidth.
2. Find the quality factor for an RLC series circuit with L=0.25mH, C=25μF and R=10ohm.
3. A series RLC circuit has Q=120 at resonance, a capacitance 200pF connected in series with an inductance of 150μH. calculate its bandwidth.
4. A parallel resonant circuit having a coil of 150μH resonats at 1MHz. if value of circuit Q is 60, calculate i)value of capacitor, ii)value of resistor, iii) impedance at resonance.

P.R. GOVERNMENT COLLEGE (A)
Electronics - Practical 1 [Code: EL1202P]
Semester – I
Basic Circuit Theory
w.e.f. 2019-20 ADMITTED BATCH

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

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
Electronics - Semester – II
Paper – 2 [Code: EL2202]
W.e.f. 2019-20ADMITTED BATCH

Electronic Devices and Circuits

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

Course Learning Outcomes

The subject aims:

- ✓ Students will reliably demonstrate skills in solving problems concerning
- ✓ The capability to use abstractions to analyze and design BJT simple electronic circuits
- ✓ The capability to design and construct circuits, take measurements of circuit behavior and performance, compare with predicted circuit models and explain discrepancies.
- ✓ Describe the scientific principles that apply to the basic
- ✓ Understand the Photo Electric Devices.
- ✓ Analyze the SCR, FET, and UJT.
- ✓ Provide hands-on opportunities for students to construct electronic circuits and build electronic projects of varying difficulty levels, ranging from simple to intermediate
- ✓ Cultivate and sustain students' interest in learning through circuit simulations and self-assessment activities
- ✓ Promote active learning through activities such as information search and presentations

Learning Outcomes:

Students will be able to:

- ➢ Recall construction, working, V-I characteristics of PN Junction Diode & Zener Diode.
- ➢ Observe Fixed bias and self bias arrangement
- ➢ Compare FET over BJT
- ➢ Explain UJT as a relaxation oscillator
- ➢ Demonstrate Solar Cell and LED
- ➢ Determination of h-parameters from the characteristics of BJT

P.R.GOVERNMENT COLLEGE (A), KAKINADA
Electronics - Semester – II
Paper – 2 [Code: EL2202]
W.e.f. 2019-20 ADMITTED BATCH

Electronic Devices and Circuits

4 Hours/Week [Total: 60 hrs.] **2019-20** **Credits: 3**

SYLLABUS

UNIT - 1: (12 Hrs)
P-N junction diodes:

P-N junction Diode, Depletion region, Barrier Potential, Working in Forward and Reverse bias condition – Junction capacitance, Diode current equation (no derivation)– Effect of temperature on reverse saturation current – construction, working, V-I characteristics and simple applications of Zener diode.

UNIT –II :(12 hrs)
Bipolar junction transistor and its biasing: (d.c)

Introduction, Transistor Construction, NPN and PNP transistors working, current components in BJT, Operation and characteristics of CB, CE, CC Configurations, Transistor as an amplifier.

BJT Biasing: Fixed-Bias Circuit, Collector to base bias and self bias, Bias Stabilization.

UNIT-III :(12hrs)
Field Effect Transistors & UJT:

Introduction, Construction, Operation and Characteristics of FET/JFET, Drain and Transfer characteristics, Depletion-type, and Enhancement-Type MOSFETs.

UJT: construction-working, V-I characteristics, UJT as a Relaxation oscillator.

UNIT - IV: (10hrs)
Photo electric devices:

Light-Emitting Diodes (LEDs), Photo diode, Photo transistors, Structure and operation of LDR.IR emitters

UNIT-V :(14hrs)
Rectifiers & Power supplies:

Rectifiers: Half wave, full wave and bridge rectifiers - Efficiency-ripple factor-Regulation (only) Types of filters - L-section & π-section filters.

Block diagram of regulated power supply, Three terminal fixed voltage I.C.regulators (78XX and &79XX). Block diagram and working of SMPS (switch mode power supplies)

Reference Books:

21. Grob's Basic Electronics - Mitchel E.Schultz 10th Edn. Tata McGraw Hill (TMH)
22. Network lines and fields- Ryder- Prentice Hall of India (PHI)
23. Circuit analysis - P.Gnanasivam- Pearson Education
24. Circuits and Networks - A.Sudhaksr & Shyammohan S. Palli - TMH
25. Network Theory - Smarajit Ghosh - PHI
26. Electronic Devices and Circuits-Millman and Halkias - TMH
27. Electronic Devices and Circuits-Allen Mottershead - PHI
28. Principles of Electronics- V.K. Mehta and Rohit Mehta - S Chand &Co
29. Electronic Devices and Circuit Theory- R.L.Boylestad and L.Nashelsky- Pearson Education.
30. Pulse digital switching waveforms -Millman &Taub - TMH.
31. Applied Electronics- R.S.Sedha - S Chand &Co
32. A First course in Electronics- AA Khan & KK Day- PHI
33. Principles of Electronic circuits- Stanely G.Burns and Paul R. Bond- Galgotia.
34. Electronic Principles and Applications – A.B. Bhattacharya- New Central Book Agency Pvt.
35. Basic Electronics — D.C. Tayal
36. Basic Electronics — Grobb
37. Electrical Technology II — B.L. Thereja & A.K. Thereja
38. Electronics — Ryder
39. Hand book of Electronics — Gupta & Kumar
40. Unified Electronics Vol 1 & 2 — Arora

P.R. GOVERNMENT COLLEGE (A), KAKINADA
Electronics - Semester – II
Paper – 2 [Code: EL2202]
w.e.f. 2019-20 ADMITTED BATCH

Electronic Devices and Circuits

4 Hours/Week [Total: 60 hrs.] **2019-20** **Credits: 3**

MODEL QUESTION PAPER

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

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

Section	Questions to be given	Questions to be answered	Marks
A	5	3	3 x 10M = 30M
B	9	6	6 x 5 M = 30M
Total	14	9	60M

Blue Print

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Problems 5 marks	Marks allotted
P-N Junction	1	2		20
Bipolar Junction Transistor (BJT)	1	1	1	20
Field Effect Transistor & UJT	1	**1**	1	20
Photo Electric Devices	1	1		15
Rectifiers & Power supplies	1	1	1	20
Total Marks				95

Note: At least two problems should be answered.

Electronic Devices and Circuits
Paper – 2 Semester - 2
QUESTION BANK

UNIT-I: P-N junction diodes

ESSAY QUESTIONS

1. Explain the construction of P-N junction diode and explain its working in forward and Reverse bias condition.
2. Explain the V-I characteristics of P-N junction diode in forward and reverse bias.
3. Explain the V-I characteristics of Zener diode in forward and reverse bias.

SHORT ANSWER TYPE QUESTIONS

4. Explain the Effect of temperature on reverse saturation current.
5. Write the application of Zener diode as voltage regulator.
6. Explain Junction capacitance of a diode.
7. Write a note on Diode current equation.

UNIT-II: Bipolar junction transistor and its biasing: **(D.C)**

ESSAY QUESTIONS

1. What is a transistor? Explain the construction & working of NPN transistor.
2. What is a transistor? Explain the construction & working of PNP transistor.
3. Explain the input and output characteristics of CE configuration of BJT with diagrams.

SHORT ANSWER TYPE QUESTIONS

4. Obtain the relation between α, β & γ
5. Explain briefly about the CB configuration of BJT
6. Explain briefly about the CC configuration of BJT
7. Explain how a transistor acts as an amplifier.
8. Explain self bias in BJT
9. Explain fixed bias circuit of BJT.

PROBLEMS

10. The constant α of a transistor is 0.9. What would be the change in the collector current corresponding to a change of 4 mA in the base current in a collector emitter arrangement?
11. For a transistor $\beta = 40$ and $I_B = 25\ \mu A$. Find the value of I_E.
12. In a transistor, the base current is 0.08 mA and the emitter current is 9.6 mA. Find collector current, α & β.

UNIT-III: Field Effect Transistors & UJT

ESSAY QUESTIONS

13. Explain the Construction and Working of JFET.
14. Explain the Construction and Working of Depletion-type MOSFET.
15. Explain construction and working of UJT.

SHORT ANSWER TYPE QUESTIONS

16. Write a short note on Enhancement-Type MOSFET.
17. Explain the drain & transfer characteristics of JFET.
18. Explain the V-I characteristics of UJT.
19. Explain how UJT acts as a Relaxation oscillator.

PROBLEMS

20. 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.
21. For an N-Channel JFET, I_{DES} = 8.7 mA, V_1 = - 3V, V_{GS} = - 1 Volt. Find the values of I_D and g_m.
22. 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-IV: Photo electric devices:

ESSAY QUESTIONS

23. Explain the Construction & working of LED.
24. Explain the Construction & working of LDR

SHORT ANSWER TYPE QUESTIONS

25. Explain the operation of Photo diode.
26. Explain the operation of Photo transistor.
27. Explain a note on IR emitters.
28. Write the applications of LDR & LED.

UNIT-V: Rectifiers & Power supplies

ESSAY QUESTIONS

29. Explain the construction and working of half wave rectifier. Obtain expressions for efficiency & ripple factor.
30. Explain the construction and working of full wave rectifier. Obtain expressions for efficiency & ripple factor.
31. Explain the construction and working of bridge rectifier. Obtain expressions for efficiency & ripple factor.
32. Explain the block diagram of SMPS (Switch Mode Power Supply).

SHORT ANSWER TYPE QUESTIONS

33. What is a filter? Explain L-section filter.
34. What is a filter? Explain π-section filter.
35. Draw the block diagram of regulated power supply.
36. Explain Three terminal voltage I.C. regulator (78XX).

PROBLEMS

37. A full-wave rectifier supplies power to 1 KΩ load. The input supply voltage is 220 V_{rms}. Neglecting the forward resistance of the diode, calculate V_{dc} and I_{dc}.
38. A diode having a resistance of 1 KΩ is connected as half wave rectifier with load 10KΩ and AC voltage of 300 volts peak value is applied to input. Calculate peak, average value & rms value of current.
39. The D.C output voltage is 40 Volt at full load and 41 volt without any load current. Calculate the load regulation factor in percentage.

P.R. GOVERNMENT COLLEGE (A)
Electronics - Practical 2 [Code: EL2202P]
Semester – 2
w.e.f. 2019-20 ADMITTED BATCH

Electronic Devices and Circuits

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

Any **Five** experiments.

1. V-I Characteristics of junction diode
2. V-I Characteristics of Zener diode
3. Regulated power supply using Zener diode
4. BJT input and output characteristics
5. FET input and output characteristics
6. UJT characteristics
7. LDR characteristics
8. IC regulated power supply(IC-7805)

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

PAPER – 3 [Code: EL3202]

w.e.f. 2018-19 ADMITTED BATCH

DIGITAL ELECTRONICS

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

Course Learning Outcomes

The subject aims:

- ✓ Knowledge of Number System
- ✓ Comprehension about Logic Gates
- ✓ Know the applications of Semiconductor Memories
- ✓ Evaluate Combinational Circuits
- ✓ Analysis Karnaugh maps

Learning Outcomes:

Students will be able to:

- ➢ Recall Binary number system.
- ➢ Recognize Universal building blocks
- ➢ Observe Flip flops-RS,D flip flops-JK and JK master-slave
- ➢ Demonstrate Logic families

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

PAPER – 3 [Code: EL3202]

w.e.f. 2018-19 ADMITTED BATCH

DIGITAL ELECTRONICS

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

SYLLABUS

Unit – I (12 hrs)

Number system and codes:

Decimal, Binary, Hexadecimal, Octal, BCD, Conversions – Binary to Decimal vice versa – Binary to Hexa decimal vice versa, Decimal to Hexa decimal vice versa, Complements (1's and 2's,), Addition, Subtraction. Gray code & Excess-3 Code conversion of - BCD to Gray vice versa – BCD to Excess 3 Code vice versa.

Unit- II (12 hrs)

Boolean algebra and theorems:

Boolean algebra, De-Morgan's laws. Logic gates – AND, OR & NOT, NAND, NOR, EX-OR, EX-NOR, realization of basic gates from NAND & NOR. Minimization Techniques (Karnaugh Map Method: 2 & 4 variables), don't care condition. Standard representation of logic functions (SOP and POS),

Unit-III (15 hrs)

Combinational Digital circuits:

Adders-Half & full adder, Parallel binary adder. Subtractor-Half and full subtractors, Multiplexers (2:1, 4:1)) and Demultiplexers (1:2, 1:4), Encoder (8-line-to-3-line) and Decoder (3-line-to-8-line).

UNIT-IV (9 hrs)

IC-Logic families:

TTL logic (NAND gate), DTL logic, RTL Logic, CMOS Logic families (NOR gate).

UNIT-V (12 hrs)

Sequential Digital circuits & Registers:

Flip Flops: S-R FF, J-K FF, T & D type FFs, Master-Slave J-K FFs and their Truth tables, registers: Types – SIPO, SISO, PIPO, and PISO.

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 university press
4. S.Salivahana&S.Arivazhagan-Digital circuits and design
5. Fundamentals of Digital Circuits by Anand Kumar

Reference Books:

1. Herbert Taub and Donald Schilling. "Digital Integrated Electronics". McGraw Hill. 1985.
2. S.K. Bose. "Digital Systems". 2/e. New Age International. 1992.
3. D.K. Anvekar and B.S. Sonade. "Electronic Data Converters: Fundamentals & Applications". TMH. 1994.
4. Malvino and Leach. "Digital Principles and Applications". TMG Hill Edition.

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

PAPER – 3 [Code: EL3202]

w.e.f. 2018-19 ADMITTED BATCH

DIGITAL ELECTRONICS

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	5	3	3 x 10M = 30M
B	9	6	6 x 5 M = 30M
Total	14	9	60M

Blue Print

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Problems 5 marks	Marks allotted
1. **Number system and codes**	1		2	20
2. **Boolean algebra and theorems**	1	1	1	20
3. **Combinational Digital circuits**	1	2	---	20
4. **IC-Logic families**	1	1	---	15

5. **Sequential Digital circuits & Registers**	1	2	---	20
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. Explain the process of converting BCD to GRAY code and GRAY code to BCD.

PROBLEMS

1. Write Binary Addition rules. Add the following using Binary addition
   (a) $(10111)_2$ and $(10101)_2$ (b) $(10110)_2$ and $(11011)_2$.
2. Convert the following (1) $(11011)_2$ to $(\ ?\ )_{10}$ (2) $(78)_{10}$ to $(\ ?\ )_2$
3. Convert the Hexadecimal numbers (ACB) & (CAD) in to binary system.
4. Convert the following (a) $(\ ACB\ )_{16} \rightarrow (\ ?\ )_2$ (b) $(\ 11010101\ )_2 \rightarrow (\ ?\ )_{16}$
5. Convert the following (a) $(\ 1101.110\ )_2 \rightarrow (\ ?\ )_{10}$ (b) $(\ 56\ )_{10} \rightarrow (\ ?\ )_2$
6. Find the equivalent Binary for the Gray (10011)

UNIT-II: - Boolean algebra and theorems:

ESSAY QUESTIONS

1. State and Prove Demorgan's theorems.
2. What is k-map? Explain two, three and four variable k-map representation by using example.
3. What is K-map? Simplify the following 4 variable K-map by using SOP method $F(ABCD)=\sum(0,1,2,3,8,9,10,11,13,15)$

SHORT ANSWER QUESTIONS

1. Explain AND, OR & NOT logic gates with their truth tables.
2. Explain NAND, NOR, EX-OR, EX-NOR login gates with their truth tables
3. Explain how AND, OR and NOT gates are realized from NAND & NOR gates.

PROBLEMS

1. Show that **AB + A(B+C) + B(B+C) = B+AC**
2. Draw a two variable K-map by using SOP method for $F\ (AB) = \sum\ (0,3)$.

3. Reduce F (A,B,C,D) = π (0,1,3,4,5,7,9,10,11,13,14,15) using 4 variable k-map POS method.

UNIT-III: - Combinational Digital circuits:

ESSAY QUESTIONS

1. Construct and verify the truth table of half adder and full adder
2. Explain 4: 1 Multiplexer with diagram.

SHORT ANSWER QUESTIONS

1. Draw the circuit of parallel binary adder and explain the operation.
2. Explain Half Subtractor by using truth table.
3. Explain Demultiplexers.
4. Explain 8-line-to-3-line Encoder.
5. Explain 3-line-to-8-line Decoder.

UNIT-IV: - IC-Logic families:

ESSAY QUESTIONS

1. Explain the construction and working of TTL gate with neat diagram.
2. Explain the construction and working of DTL gate with neat diagram.

SHORT ANSWER QUESTIONS

1. Explain RTL Logic in brief with diagram in brief.
2. Explain CMOS Logic in brief with diagram in brief.

UNIT-V: - Sequential Digital circuits & Registers:

ESSAY QUESTIONS

1. What is flip flop? Draw the circuit of J-K flip flop and discuss its working with the help of truth table.
2. What are Shift registers? Explain the construction and working of Parallel-In-Serial-Out shift register.

SHORT ANSWER QUESTIONS

1. Explain the working of master slave JK flip flop with truth table.
2. Explain SR flip flop with truth table.
3. Explain D flip flop with truth table.
4. Explain T flip flop with truth table.
5. Explain the working of SIPO shift register.
6. Explain the working of SISO shift register.

7. Explain the working of PIPO shift register.

P.R. GOVERNMENT COLLEGE (A)
Electronics - Practical 3 [Code: EL3202P]
Semester – 3
w.e.f. 2018-19 ANDMITTED BATCH

DIGITAL ELECTRONICS

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

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 of RS , JK, T-F/F using NAND gates
7. 4-bit binary parallel adder and subtractor using IC 7483
8. BCD to Seven Segment Decoder using IC -7447/7448

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

PAPER – 4 [Code: EL4202]

w.e.f. 2018-19 ADMITTED BATCH

OP – AMP & Digital IC-applications

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

Course Learning Outcomes

The subject aims:

- ✓ Students will reliably demonstrate skills in solving simple second order differential equation.
- ✓ Provide hands-on opportunities for students to construct electronic circuits and build electronic projects of varying difficulty levels, ranging from simple to intermediate
- ✓ Cultivate and sustain students' interest in learning through circuit simulations and self-assessment activities
- ✓ Promote active learning through activities such as information search and presentations.

Learning Outcomes:

Students will be able to:

- ➢ To study the construction of Operational Amplifier
- ➢ To study various applications of Operational amplifier such as Summing amplifier, Integrator, Differentiator, Schmitt trigger and Active filter.
- ➢ To study the construction and applications of 555 timer.

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

PAPER – 4 [Code: EL4202]

w.e.f. 2018-19 ADMITTED BATCH

OP – AMP & Digital IC-applications

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

SYLLABUS

Unit – I (12hrs)

Operational Amplifiers:

Definition, Basic op-amp Ideal op-amp, Block diagram of op-amp, op-amp parameters, inverting - non inverting amplifiers, concept of virtual ground. OP-Amp as a, summing amplifier,, differential amplifier, voltage follower, integrator, differentiator, Logarithmic amplifier.

Unit- II (12 hrs)

Op-Amp applications:

Voltage regulator, comparator, Schmitt trigger. Sine wave generator, square wave generator, triangular wave generator, Active filters (Basics) -low pass filter, high pass filter, band pass filters.

Unit - III (10 hrs)

IC555 Timer:

IC 555 timer pin diagram and its description, astable and monostable multivibrators.

Unit-IV (14 hrs):

Combinational Logic Circuits:

Design of Code convertor: BCD to Decimal decoder (IC7442), BCD to Seven Segment display decoder (logic diagram & truth table only).

Sequential Logic Circuits:

Counters: Counters – Synchronous & Asynchronous, Design of asynchronous Mod16, Mod-10, Mod N counter, Binary Up/Down Counter.

UNIT-V (12 hrs)

Data converters:

A/D converter: - Introduction, Digital to Analog (DAC) converter: Binary weighted Resistor DAC, R-2R Ladder type DAC, Analog to Digital Converters (ADC): Successive Approximation type ADC, Single Slop & Dual-Slope type ADC.

Reference Books:

1. Jacob Millan, Micro Electronics, McGraw Hill.

2. Mithal G K, Electronic Devices and Circuits Thana Publishers.

3. Allan Motter shead, Electronic Devices and Circuits – An Introduction- Prentice Hall

TEXT BOOKS:

1. G.K.Kharate-Digital electronics-oxford university press
2. M.Morris Mano, "Digital Design "3rd Edition, PHI, New Delhi.
3. Op Amp and Linear Integrated Circuits by Ramakant Gaykwad
4. Linear Integrated Circuits by Roy Choudary

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

PAPER – 4 [Code: EL4202]

w.e.f. 2018-19 ADMITTED BATCH

OP – AMP & Digital IC-applications

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	5	3	3 x 10M = 30M
B	9	6	6 x 5 M = 30M
Total	14	9	60M

Blue Print

Chapter Name	**Essay Questions 10 marks**	**Short Questions 5 marks**	**Problems 5 marks**	**Marks allotted**
Operational Amplifiers	1	1	2	25
Op-Amp Applications	1	2		20
IC555 Timer	1	1	---	15
Combinational Logic Circuits & Sequential Logic Circuits	1	1		15
Data converters	1	2	---	20
Total Marks				95

Note: At least two problems should be answered.

QUESTION BANK

OP – AMP & Digital IC-applications

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 Integrator and Differentiator with output waveforms.

SHORT ANSWER TYPE QUESTIONS

1. Explain the block diagram of Op-Amp
2. Give the characteristics of an ideal Op-Amp.
3. Explain the concept of virtual ground.
4. Describe the working of Op-Amp as Logarithmic amplifier.
5. Explain Op- Amp as summing amplifier.
6. How does Op-Amp act as a voltage follower?

PROBLEMS

1. 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.
2. 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.
3. Calculate the output voltage of a non-inverting multiplier with R_1 = 100 KΩ, R_f =600 KΩ and V_1 = 2V
4. 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.
5. In a Subtractor circuit if R_1 = 10kΩ, R_f = 10KΩ, V_1 = 5V and V_2 = 10V. Find the value of output voltage.
6. 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

1. Discuss the working of Op- Amp as Voltage regulator.
2. Explain the construction and working of Schmitt trigger using Op-Amp.
3. Explain the construction and working of Sine wave generator using Op-Amp.

SHORT ANSWER TYPE QUESTIONS

1. Explain the working of Op-Amp as comparator.
2. Explain the construction and working of Square wave generator using Op-Amp.
3. Explain how Op-Amp acts as low pass filter & high pass filters.
4. Explain how Op-Amp acts as band pass filter.

UNIT-III: - IC555 Timer:

ESSAY QUESTIONS

1. Explain the pin diagram of Timer IC-555.

SHORT ANSWER TYPE QUESTIONS

1. Write a brief note on Monostable multivibrator using IC-555.
2. Write a brief note on Astable multivibrator using IC-555.

UNIT-IV: - Combinational Logic Circuits:

ESSAY QUESTIONS

1. Design BCD to Seven Segment display decoder with a logic diagram & give its truth table.
2. What is a counter? Design and explain Mod-16 counter.

SHORT ANSWER TYPE QUESTIONS

1. Draw and explain BCD to Decimal decoder (IC7442).
2. What is a counter? Design and explain Mod-10 counter.
3. What is a counter? Design and explain Mod-N counter.
4. Compare Asynchronous and synchronous counter.
5. Design binary up/down counter

UNIT-V: - Data converters:

ESSAY QUESTIONS

1. Explain the working of an A/D converter.
2. Explain the working of a D/A converter.
3. Draw and explain R-2R Ladder type DAC.

SHORT ANSWER TYPE QUESTIONS

1. Explain Binary weighted Resistor DAC.
2. Explain Successive Approximation type ADC.
3. Give a brief explanation of Single Slope ADC.
4. Give a brief explanation of Dual Slope ADC.

P.R. GOVERNMENT COLLEGE (A)
Electronics - Practical 4 [Code: EL4202P]
Semester – 4
w.e.f. 2018-19 ADMITTED BATCH

OP – AMP & Digital IC-application

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

Any **Five** experiments.

1. Op-Amp as inverting amplifier (simulation experiment also)
2. Op-Amp as Non-inverting amplifier (simulation experiment also)
3. Op-Amp as integrator (simulation experiment also)
4. Op-Amp as differentiator (simulation experiment also)
5. Op-Amp as adder (simulation experiment also)
6. Op-Amp as adder Subtractor (simulation experiment also)
7. Op-Amp as voltage to current converter
8. Op-Amp as sine wave generator (Wien bridge oscillator)
9. Op-Amp as comparator
10. Astable multivibrator determination of frequency (using IC-555)
11. Schmitt trigger using IC-555 timer

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2017-18 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. 2017-18 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

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. 2017-18 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 1/2 Hrs Max Marks: 60

Section	Questions to be given	Questions to be answered	Marks
A	**5**	**3**	**3 x 10M = 30M**
B	**9**	**6**	**6 x 5 M = 30M**
Total	**14**	**9**	**60M**

Blue Print

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Programs 5 marks	Marks allotted
Architecture of 8085 Microprocessor	1	2	---	20
Memory	1	1	---	15
Programming 8085	1	---	2	20
Interfacing memory	1	2	---	20
Microprocessor applications	1	2	---	20
Total Marks				95

PAPER – 5 SEMESTER - 5
MICROPROCESSORS (INTEL 8085)

QUESTION BANK

ESSAY ANSWER TYPE QUESTIONS

UNIT-I:Architecture of 8085 Microprocessor

1. Draw the 8085 pin-out diagram & explain each pin functioning.
2. Draw the Block diagram of Intel 8085 and explain each block.
3. Explain in detail about Control Signal Generation and status signals of 8085.
4. Explain about Register structure, multiplexing & de-multiplexing of address / data bus in 8085.
5. Write in detail about Instruction set classification of 8085.
6. Write about the addressing modes and interrupts in 8085.

UNIT-II: Memory

1. Explain about Instruction cycle, machine cycle, T-state in 8085.
2. Draw the timing diagrams for Opcode Fetch Cycle and explain the process in detail.
3. Write in detail about Memory Read, Memory Write, I/O Read, I/O Write operations.

UNIT-III: Programming of 8085

1. Explain in detail about addition, subtraction, multiplication and division with an example.
2. Explain about Stack & Subroutines, Debugging in 8085.
3. Explain Ascending & Descending order (8 bit) with an example.
4. Write about Stack & Subroutines in 8085. And also explain debugging in 8085.

UNIT-IV: Interfacing Memory:

1. Explain 2K X 8 ROM, RAM to 8085 interfacing in detail.
2. Write about interfacing an I/O port in Memory Mapped I/O and I/O Mapped I/O.
3. Write difference between I/O mapped I/O and Memory Mapped I/O.

UNIT-V: Microprocessor applications

1. Draw and explain Block Diagram of 8255.
2. Draw the pin configuration of 8255 and explain the modes of 8255.
3. Draw the Architecture of 8279 and explain in detail,
4. Draw the block diagram of 8279 and explain each block.
5. Explain about the interfacing of stepper motor with 8085.

SHORT ANSWER TYPE QUESTIONS

UNIT-I:Architecture of 8085 Microprocessor

1. Draw the 8085 pin-out diagram.
2. Explain interrupts in 8085.
3. Explain addressing modes of 8085.
4. Draw the Block diagram of Intel 8085.
5. Explain about 8085-Register structure.

UNIT-II:Memory

1. Draw the Timing diagrams for Opcode Fetch Cycle in 8085.
2. Write short note on Memory Read, Memory Write in 8085.
3. Write short note on I/O Read, I/O Write in 8085.
4. Explain about Instruction cycle and machine cycle of 8085.

UNIT-IV:Interfacing Memory:

1. Explain about interfacing an I/O port in Memory Mapped I/O.
2. Explain about interfacing an I/O port in I/O Mapped I/O.
3. Write any 5 Differences between I/O mapped I/O and Memory Mapped I/O.
4. Explain the interfacing of 2K*8 RAM to 8085.
5. Explain the interfacing of 2K*8 ROM to 8085.

UNIT-V: Microprocessor applications:

1. Write short notes on modes of Programmable peripheral device (8255).
2. Draw the block diagram of 8255.
3. Draw the block diagram of 8279.
4. Explain about the stepper motor working.

PROGRAMMING

UNIT-III:Programming of 8085

1. Write a program on subtraction of two 8-bit numbers.
2. Write a program on multiplication of two 16-bit numbers.
3. Write a program on 16 bit addition.
4. Write a program on largest of set numbers each of 8-bit.

P.R. GOVERNMENT COLLEGE (A)
Electronics - Practical 5 [Code: EL5202P]
w.e.f. 2017-18 ADMITTED BATCH

Semester – 5
MICROPROCESSORS (INTEL 8085)

3 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. 2017-18 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. 201**7-18** ADMITTED BATCH

PAPER – 6 [Code: EL6202]

ELECTRONIC COMMUNICATION SYSTEMS

3 Hours/Week [Total: 45 hrs] **2018-2019** **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 –III (7Hrs)

Basic receiver circuits:

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

UNIT –IV (10Hrs)

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

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

UNIT –V (8Hrs)

Digital Communications:

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

Unit VI (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. 2018-19 ADMITTED BATCH

PAPER – 6 [Code: EL6202]

ELECTRONIC COMMUNICATION SYSTEMS

3 Hours/Week [Total: 45 hrs] **2018-2019** **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	**5**	**3**	**3 x 10M = 30M**
B	**9**	**6**	**6 x 5 M = 30M**
Total	**14**	**9**	**60M**

Blue Print

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Programs 5 marks	Marks allotted
Modulation-I	1	1	2	25
Basic receiver circuits	1	1	---	15
Radio wave propagation	1	2	---	20
Digital communications	1	1	---	15
Cellular mobile communications	1	2	---	20
Total Marks				95

SEM-V PAPER – 6

ELECTRONIC COMMUNICATION SYSTEMS

QUESTION BANK

ESSAY QUESTIONS

UNIT-I

1. Define amplitude modulation. Derive the voltage equation of an AM wave. What are side band frequencies?
2. Explain the need for modulation. Discuss the frequency spectrum of AM wave. Explain the working of a diode modulator.
3. Draw and explain Diode modulators and power relations in the AM wave.
4. Draw and explain Theory of FM, frequency spectrum of FM wave.

UNIT-II

5. Draw and explain Superheterodyne Receiver block diagram.
6. Draw and explain FM receiver.

UNIT-III

7. Explain Electromagnetic waves, properties and applications.
8. Derive the Sampling theorem.
9. Draw and explain PAM and PWM.
10. Draw and explain PWM and PPM.

UNIT-IV

11. Draw and explain Amplitude Shift Keying.
12. Draw and explain Frequency Shift Keying.

UNIT-IV

13. Draw and explain the block diagram of mobile communication network.
14. What is the concept of communication and explain the GSM.
15. What is concept of communication and explain CDMA Technologies.

SHORT ANSWER TYPE QUESTIONS

UNIT-I

16. Explain Need for modulation.
17. Explain Suppression of carrier.
18. Explain power contents of the carrier and sidebands,
19. Give brief explanation of Generation of FM signals.
20. Explain narrow band FM, wide band FM.
21. Draw and explain suppression of one side band- phase shift method.

UNIT-II

22. Explain slope, and balanced slope.
23. Explain Ratio detector.

UNIT-III

24. Explain Communication bands
25. Explain PAM.
26. Explain PPM.
27. Explain PWM.

UNIT-IV

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

UNIT-V

30. Explain the frequency bands,
31. Explain the SIM number.
32. Explain the IMEI number.
33. Explain the need for data encryption.

PROBLEMS

34. An AM wave is represented by the expression $(e_c)_{AM} = 7.5\ (1+0.6\cos 6280\ t)\ \cos\ (10^6\ \pi t)$ V Calculate the maximum and minimum amplitude of AM wave.
35. 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.
36. The load current in the transmitting antenna of an unmodulated AM transmitter is 6amp. What will be the antenna current when modulation is 60%?
37. A carrier wave of 1000W is subjected to 100% modulation. Calculate:
    (1) Power of modulated wave
    (2) Power in USB
    (3) Power in LSB
38. In an amplitude modulated wave, the audio signal and carrier signal lare givsen by 20 sin 2π (1500t) and 100 sin 2π (10^5t). Find the frequencies of signal nd carrier wave and Percentage modulation.

P.R. GOVERNMENT COLLEGE (A)
Electronics - Practical 6 [Code: EL6202P]
w.e.f. 2017-18 ADMITTED BATCH

Semester – 5
ELECTRONIC COMMUNICATION SYSTEMS

3 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. 2017-18 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. 2017-18 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)

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
B.Sc. III Year - Electronics – Semester – VI
w.e.f. 2017-18 ADMITTED BATCH

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	**5**	**3**	**3 x 10M = 30M**
B	**9**	**6**	**6 x 5 M = 30M**
Total	**14**	**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	1	2	---	20
Addressing modes, instruction set of 8051	1	1	1	20
Programming	1	---	2	20
Data communication	1	1	---	15
Total Marks				**95**

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

ESSAY ANSWER TYPE QUESTIONS

UNIT-I: Introduction to 8051

1. Give the differences between microprocessor and micro controller.
2. Write the differences between Harvard and von-Neumann architectures.
3. Write a short note on assembler, compiler and simulator/debugger in 8051.
4. 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 - Practical 7 A [Elective A]
w.e.f. 2017-18 ADMITTED BATCH

Semester – 6
MICRO CONTROLLER AND INTERFACING

3 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

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2017-18 ADMITTED BATCH

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. 2017-18 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. 2017-18 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	**5**	**3**	**3 x 10M = 30M**
B	**9**	**6**	**6 x 5 M = 30M**
Total	**14**	**9**	**60M**

Blue Print

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Marks allotted
Introduction to computers	1	1	15
Basic trouble shooting	1	2	20
Storage devices	1	2	20
Smps & monitor	1	2	20
Printers & preventive maintenance	1	2	20
Total marks			95

P.R. GOVERNMENT COLLEGE (A)
Electronics - Practical 7 B [Elective B]
Semester – 6
w.e.f. 2017-18 ADMITTED BATCH

PC MAINTENANCE AND TROUBLE SHOOTING

3 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), KAKINADA
B.Sc. III Year - Electronics – Semester – 6
w.e.f. 2017-18 ADMITTED BATCH

PAPER – 8A 1 [Cluster Elective A 1]
POWER ELECTRONICS

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

Course Learning Outcomes

The subject aims:

- To study the characteristics of various power semiconductor devices.
- To understand the operation of power inverters.
- To study the operation of rectifiers with different loads.
- To understand the operation of different types of choppers.
- To understand the operation and controlling of motors.

Learning Outcomes:

Students will be able to:

- Explain the characteristics of various power semiconductor devices and analyze the static and dynamic characteristics of SCR's.
- Design firing circuits for SCR.
- Explain the operation of rectifiers with different loads.
- Analyze the operation of different types choppers.

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – 6
w.e.f. 2017-18 ADMITTED BATCH

PAPER – 8 A 1 [Cluster Elective A 1]
POWER ELECTRONICS

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

SYLLABUS

Unit- 1 (9 Lectures)

Power devices: Need for semiconductor power devices, Power diodes, Introduction to family of thyristors.

Silicon Controlled Rectifier (SCR): structure, I-V characteristics, Turn-On and Turn-Off characteristics, Factors affecting the characteristics of SCR, Control circuits design and Protection circuits.

Unit- 2 (9 Lectures)

Diac and Triac: Basic structure, working and V-I characteristics of diac and triac.

Insulated Gate Bipolar Transistors (IGBT): Basic structure, I-V Characteristics, switching characteristics.

Unit- 3 (9 Lectures)

Choppers: Basic chopper circuit, types of choppers (Type A-D), step-down chopper, step-up chopper, Morgan's chopper (operation only)

Unit-4 (9 Lectures)

Power Inverters: Need for commutating circuits and their various types, D.C. link inverters, Parallel capacitor commutated invertors with and without reactive feedback and its analysis, Series Inverter, bridge invertors.

Unit- 5 (9 Lectures)

Electromechanical Machines: DC Motors, Principle of operation, EMF equation, Back EMF, Factors controlling motor speed, AC motor (Induction Motor only), Rotor and stator, torque & speed of induction motor.

Suggested Books:

1. Power Electronics, K. Hari Babu, Scitech Publication.

2. Power Electronics, P.C.Sen, TMH

3. Power Electronics & Controls, S.K. Dutta

4. Power Electronics, M.D.Singh&K.B. Khanchandani, TMH

5. Power Electronics Circuits, Devices and Applications, 3rd Edition, .H.Rashid, Pearson Education

6. Power Electronics, Applications and Design, Ned Mohan, Tore.

7. Power Electronics, P.C.Sen, TMH.

8. Power Electronics, M.S.Jamil Asghar, PHI.

9. A Textbook of Electrical Technology-Vol-II, B.L.Thareja, A.K.Thareja, S.Chand

P.R. GOVERNMENT COLLEGE (A), KAKINADA

B.Sc. III Year - Electronics – Semester – 6

w.e.f. 2017-18 ADMITTED BATCH

PAPER – 8 A 1 [Cluster Elective A1]

POWER 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 1/2 Hrs Max Marks: 60

Section	Questions to be given	Questions to be answered	Marks
A	**5**	**3**	**3 x 10M = 30M**
B	**9**	**6**	**6 x 5 M = 30M**
Total	**14**	**9**	**60M**

Blue Print

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Marks allotted
Unit - 1	1	2	20
Unit – 2	1	2	20
Unit – 3	1	2	20
Unit – 4	1	2	20
Unit – 5	1	1	15
Total marks			95

PAPER – 8 A 1 [Cluster Elective A 1]
POWER ELECTRONICS
QUESTION BANK

ESSAY ANSWER TYPE QUESTIONS

UNIT-I:Power devices and Silicon Controlled Rectifier (SCR)

1. Draw the SCR structure, I-V characteristics and explain them.
2. Explain about Turn-On and Turn-Off characteristics, Factors affecting the characteristics of SCR.
3. Explain about Control circuits design and Protection circuits.
4. Explain need for semiconductor power devices, Power diodes.

UNIT-II:Diac and Triac, Insulated Gate Bipolar Transistors (IGBT)

1. Basic structure, working and V-I characteristics of diac.
2. Basic structure, working and V-I characteristics of triac.
3. Draw and explain IGBT Basic structure, I-V Characteristics, switching characteristics.
4. Explain about the V-I characteristics of diac, triac, IGBT.

UNIT-III:Choppers

1. Draw the Basic chopper circuit and explain its working.
2. Explain the operation of step-down chopper, step-up chopper, Morgan's chopper.
3. What are the types of choppers and explain any two types in detail.

UNIT-IV:Power Inverters

1. What is the Need for commutating circuits and explain their various types.
2. Write a notes on Parallel capacitor commutated invertors with reactive feedback and its analysis.
3. Write a notes on Parallel capacitor commutated invertors without reactive feedback and its analysis.
4. What are Series Inverter, bridge invertors and explain them.

UNIT-V:Electromechanical Machines

1. Write about EMF equation, Back EMF.
2. Explain the working of AC motor (Induction Motor only), Rotor and stator.
3. Write notes on DC motors, types of DC motor and its working.
4. What are the factors that control motor speed? Also explain torque & speed of induction motor.

SHORT ANSWER TYPE QUESTIONS

UNIT-I:Power devices and Silicon Controlled Rectifier (SCR)

1. Draw the SCR structure
2. What are the Factors affecting the characteristics of SCR?
3. Draw the control circuit design.
4. What is the need of semiconductor power devices?

UNIT-II:Diac and Triac, Insulated Gate Bipolar Transistors (IGBT)

1. Draw the basic structure if diac.
2. Draw the basic structure of triac.
3. Draw the structure of IGBT.
4. Explain about the V-I characteristics of diac, triac.

UNIT-III:Choppers

1. Draw the basic chopper circuit and explain.
2. What are the types of choppers and explain any 2 types in brief.
3. Explain about step-down chopper, step-up chopper.
4. Explain the operation of Morgan's chopper.

UNIT-IV:Power Inverters

1. What is the Need for commutating circuits?
2. What are the various types of commutating circuits? Explain in brief.
3. Explain in detail about Series Inverter.
4. Explain in detail about bridge invertor.

UNIT-V:Electromechanical Machines

1. Explain the principle of working operation of D.C. motors.
2. What are the factors controlling speed of the motor?
3. Explain about stator and rotor of A.C. motor.
4. Write about torque & speed characteristics of induction motor.

P.R. GOVERNMENT COLLEGE (A)
Electronics - Practical 8 A 1 [Cluster Elective A 1]
w.e.f. 2017-18 ADMITTED BATCH

Semester – 6
POWER ELECTRONICS

3 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 full wave 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
w.e.f. 2017-18 ADMITTED BATCH

PAPER – 8 A 2 [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 of Washing 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. 2017-18 ADMITTED BATCH

PAPER – 8 A 2 [Cluster Elective A2]

CONSUMER ELECTRONICS

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

SYLLABUS

UNIT-I (9 hrs)

Microwave Ovens:

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

UNIT-II (9 hrs)

Washing Machines:

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

UNIT-III (9 hrs)

Air Conditioners and Refrigerators:

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 (9 hrs)

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)

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2017-18 ADMITTED BATCH

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 1/2 Hrs Max Marks: 60

Section	Questions to be given	Questions to be answered	Marks
A	**5**	**3**	**3 x 10M = 30M**
B	**9**	**6**	**6 x 5 M = 30M**
Total	**14**	**9**	**60M**

Blue Print

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Marks allotted
Microwave ovens	1	2	20
Washing machines	1	2	20
Air conditioners and refrigerators	1	2	20
Home/office digital devices	1	2	20
Digital access devices	1	1	15
Total marks			95

PAPER – 8 A 2 [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 - Practical 8 A 2 [Cluster Elective A 2]
w.e.f. 2017-18 ADMITTED BATCH

Semester – 6
CONSUMER ELECTRONICS

3 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

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2017-18 ADMITTED BATCH

PAPER – 8 A 3 [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. 2017-18 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:

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

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

w.e.f. 2017-18 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 1/2 Hrs Max Marks: 60

Section	Questions to be given	Questions to be answered	Marks
A	**5**	**3**	**3 x 10M = 30M**
B	**9**	**6**	**6 x 5 M = 30M**
Total	**14**	**9**	**60M**

Blue Print

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Marks allotted
Introduction to Embedded Systems	1	2	20
Custom Single Purpose Processor – Hardware Development	1	2	20
General Purpose Processor – Software Development	1	2	20
RTWA for Embedded Systems	1	2	20
Advanced Communication Principles	1	1	15
Total marks			95

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 - Practical 8 A 3 [Cluster Elective A 3]
Semester – 6
w.e.f. 2017-18 ADMITTED BATCH
EMBEDDED SYSTEMS DESIGN

3 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. 2017-18 ADMITTED BATCH

PAPER – 8 B 1 [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. 2017-18 ADMITTED BATCH

PAPER – 8 B 1 [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, Novel Networks, Arpanet, Internet, Network topologies, WAN, LAN, MAN.

Physical Layer: Transmitted media copper, twisted pair wireless, switching and encoding asynchronous communications, Narrowband, Broadband, ISDN& ATM.

UNIT-II: 9 Hrs

Data Link Layer:

Design issues, framing, error detection &correction, CRC, elementary protocol-Stop and wait, Sliding window, 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, Wireless LAN, Bridges.

UNIT-IV: 9 Hrs

Network Layer:

Virtual circuits and data gram sub nets-routing algorithm, shortest path routing, fooding, Hierarchical routing, 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, Electronic mail, 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. 2017-18 ADMITTED BATCH

PAPER – 8 B 1 [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 1/2 Hrs Max Marks: 60

Section	Questions to be given	Questions to be answered	Marks
A	**5**	**3**	**3 x 10M = 30M**
B	**9**	**6**	**6 x 5 M = 30M**
Total	**14**	**9**	**60M**

Blue Print

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Marks allotted
Unit - 1	1	2	20
Unit – 2	1	2	20
Unit – 3	1	2	20
Unit – 4	1	1	15
Unit – 5	1	2	20
Total marks			95

P.R. GOVERNMENT COLLEGE (A)
Electronics - Practical 8 B 1 [Cluster Elective B 1]
w.e.f. 2017-18 ADMITTED BATCH

Semester – 6
COMPUTER NETWORKS

3 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. 2017-18 ADMITTED BATCH

PAPER – 8 B 2 [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. 2017-18 ADMITTED BATCH

PAPER – 8 B 2 [Cluster Elective B 2]

ELECTRONIC INSTRUMENTATION

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

SYLLABUS

UNIT-I (7 hrs)

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 (9 hrs)

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 Sauty Bridge), Measurement of frequency (Wien's bridge).

UNIT-III (11 hrs)

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 By A.K.Ghosh

2. Sensors and transducers PHI 2Ed By D.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).

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

w.e.f. 2017-18 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**	**4**	**4 x 10M = 40M**
B	**10**	**6**	**6 x 5 M = 30M**
Total	**16**	**10**	**70M**

Blue Print

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Marks allotted
Measurements	1	2	20
Basic Measurement Instruments	1	2	20
Lock-In-Amplifier & Signal Generators	2	2	30
Analytical Instruments & Temperature Transducers	1	2	20
Control Systems	1	2	20
Total marks			110

P.R. GOVERNMENT COLLEGE (A)
Electronics - Practical 8 B 2 [Cluster Elective B 2]
w.e.f. 2017-18 ADMITTED BATCH

Semester – 6
COMPUTER NETWORKS

3 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.
9. To study the Characteristics of LDR, Photodiode, and Phototransistor.

P.R. GOVERNMENT COLLEGE (A), KAKINADA

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

W.e.f. 2017-18 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

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. 2017-18 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**

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 – Djafar k.Mynbaev, Lowell L. Scheiner.
3. Optical fiber 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. 2017-18 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 1/2 Hrs Max Marks: 60

Section	Questions to be given	Questions to be answered	Marks
A	**5**	**3**	**3 x 10M = 30M**
B	**9**	**6**	**6 x 5 M = 30M**
Total	**14**	**9**	**60M**

Blue Print

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Marks allotted
Fiber Optic Communication	1	2	20
Light Source And Detectors	1	2	20
Modulation	1	2	20
Optical Fiber Communication Receiver	1	2	20
Fiber Optical Sensors And Applications	1	1	15
Total marks			95

P.R. GOVERNMENT COLLEGE (A)
Electronics - Practical 8 B 3 [Cluster Elective B 3]
w.e.f. 2017-18 ADMITTED BATCH
Semester – 6
OPTICAL FIBER COMMUNICATION AND IT'S APPLICATION

3 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 PHYSICS & ELECTRONICS

WORK LOAD FOR THE YEAR 2019-20

Name of the Subject : PHYSICS

Total No. of Hours : **164**

No. of Permanent posts sanctioned : 09

No. of Permanent staff working : 03

No. of Contract faculty : 01

No. of Part – Time Faculty :

S. No	Strength	Name of the class	Theory hours	Practical Hours	No. of Batches	Total Practical Hours	Total hrs.(Theory + Practical)
1	60	I MPC TM	4	2	4	8	12
2	30	I MPC EM	4	2	2	4	8
3	30	I MPE	4	2	2	4	8
4	30	I MPCS	4	2	2	4	8
5	60	II MPC TM	4	2	4	8	12
6	30	I IMPC EM	4	2	2	4	8
7	30	I IMPE	4	2	2	4	8
8	30	I IMPCS	4	2	2	4	8
9	60	I IIMPC TM Sem V Paper V	3	2	4	8	11
10	60	I IIMPC TM Sem V Paper VI	3	2	4	8	11
11	30	I IIMPC EM Sem V Paper V	3	2	2	4	7
12	30	I IIMPC EM Sem V Paper VI	3	2	2	4	7
13	30	I II MPE Sem V Paper V	3	2	2	4	7
14	30	I II MPE Sem V Paper VI	3	2	2	4	7
15	30	II IMPCS Sem V Paper V	3	2	2	4	7
16	30	II IMPCS Sem V Paper VI	3	2	2	4	7
17	30	Cluster A Sem VI Paper VII	3	2	2	4	7
18	30	Cluster A Sem VI Paper VIII	3	2	2	4	7
19	30	Cluster B Sem VI Paper VIII	3	2	2	4	7
20	30	Cluster C Sem VI Paper VIII	3	2	2	4	7
		Total Work load for the department of PHYSICS					**164**

DEPARTMENT OF PHYSICS & ELECTRONICS

WORK LOAD FOR THE YEAR 2019-20

Name of the Subject : ELECTRONICS

Total No. of Hours : **88**

	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	II MPE	4	2	2	4	8
4	30	II MECS	4	2	2	4	8
5	30	III MPE Sem V Paper V	3	2	2	4	7
6	30	III MPE Sem V Paper VI	3	2	2	4	7
7	30	III MECS Sem V Paper V	3	2	2	4	7
8	30	III MECS Sem V Paper VI	3	2	2	4	7
9	30	Cluster A Sem VI Paper VII	3	2	2	4	7
10	30	Cluster A Sem VI Paper VIII	3	2	2	4	7
11	30	Cluster B Sem VI Paper VIII	3	2	2	4	7
12	30	Cluster C Sem VI Paper VIII	3	2	2	4	7
		Total Work load for the department of ELECTRONICS					**88**

15

DEPARTMENT OF PHYSICS & ELECTRONICS

WORK LOAD FOR THE YEAR 2019-20

Name of the Subject : **M Sc., Physics**

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)
1	30	I M Sc	20	3	1	3	23
2	30	II MSc	20	3	1	3	23
		Total Work load for M Sc Physics					**46**

Consolidated Work Load for the Academic Year 2019-20

Group	Work Load	Staff Required
Physics	164	8
Electronics	88	4
M Sc	46	2
Total Work Load	**298**	**14**

LIST OF EXAMINERS / PAPER SETTERS IN ELECTRONICS

2019 – 20

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, Yeleswaram
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	M.R. College, Peddapuram
25	A.Satya narayana Murthy	Electronics	M.R. College, Peddapuram
26	K.Venkateswarlu HOD	Electronics	Y.N.College, Narsapur

P. R . GOVERNMENT COLLEGE (A), KAKINADA

Department of Physics & Electronics
Departmental Activities Planned for 2019-2020

The department of Physics and Electronics is planning the following programmes to conduct for the academic year 2019–20.

S. No.	Activity	Probable date	Remarks
1	Counseling session for all classes of I year. a) About curriculum b) About semester system c) CBCS system d) About examination system e) About co curricular activities f) About extra curricular activities g) About extension activities h) About carrier guidance	June 4th week	
2	Post admission test	July 1st week	
3	Inaugural function of Physics Association a) To explain aims and objectives of dept., b) To start UPKAR SCHEME c) Helping hands	July 1st week	
4	Guest Lecture	July 3rd week	
5	Local Field trip surrounding industries, Awareness programme on IMD and importance	August 2nd week	
	One day work shop on Research Orientation in Physics	August 4th week	
6	Extension activity to local high schools	September 2nd week	
7	UPKAR scheme – disbursement of money to the students for their semester end examinations.	September 4th week	
8	Celebration of Sir C.V.Raman's Birth day	November 7th	
9	Guest lecture	November 3rd week	
10	College Quiz programme	December 2nd week	
11	Helping hands programme	January 1st week	
12	School level and college level Competitions with in the district for two days to inculcate awareness in science and technology	February 3rd week	
13	National Science day celebrations	February 28th	

14	UPKAR scheme – disbursement of money to the students for their semester end examinations.	March 1st 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 **2019 - 20**, list of examiners and paper setters, departmental activities which contains pages **2** is approved in the Board of Studies meeting held in the Department of Physics and Electronics on **04 – 04 - 2019**.

Members of Board of Studies			**Signatures of members**
1	Dr. K. Jyothi	Chair person	
2	D. Gangadharudu	University nominee, Lecturer in Electronics, MR College, Peddapuram	
3	Sri N.L.V.R.K.Prasad	Subject Expert, Lecturer in Electronics, Government college, Ramachandrapuram	
4	Dr. Prasad	Local Nominee, Lec.in charge/ phy, Govt.Degree College, Ramachandrapuram	
5	Sri B. Sudarshan	Representative from Industry, Andhara Electronics, kkd	
6	Dr. M.V.K.Mehar	Member	
7	Sri. K. Jaya Dev	Member	
8	Kum. B. Jhony	Member	
9	Kum.P. Sai Sri Durga	Member	
10	Kum. Sk. Shafia Begum	Member	

11	Kum. G. Devi	Member	
12	A. Gowthami	Student III MPE	
13	Y. Srujana	Student III MPE	
14	P. Jyothsna Rani	Student III MECS	
15	U. Vinod	Student III MECS	

Certificate

The syllabus, Question Bank including Blue – Print in Electronics subject for 3 years B.Sc. course of all the semesters for the academic year **2019 - 20**, list of examiners and paper setters, departmental activities is approved in the Board of Studies meeting held in the Department of Physics and Electronics on **04 – 04 - 2019**.

Total No. of Pages: **108**

Members of Board of Studies			Signatures of members
1	Dr. K. Jyothi	Chair person	
2	D. Gangadharudu	University nominee, Lecturer in Electronics, MR College, Peddapuram	
3	Sri N.L.V.R.K.Prasad	Subject Expert, Lecturer in Physics, GDC, Ramachandrapuram	
4	Dr. Prasad	Local Nominee, Lec.in charge/ Phy, IDEAL College,KKD	
5	Sri B. Sudarshan	Representative from Industry, Andhra Electronics, KKD	
6	Dr. M.V.K.Mehar	Member	
7	U.V.B.B Krishna Prasad	Member	
8	K. Jaya Dev	Member	6/4/19
9	L.M.S Ganesh	Member	
10	B.Srikanth	Member	
11	B. Jhony	Member	
12	P. Sai Sri Durga	Member	
13	A. Gowthami	Student III MPE	
14	Y. Srujana	Student III MPE	
15	U. Vinod	Student III MECS	
16	B. Sai Ram	Student II MPE	