



S.R.R. & C.V.R. GOVT. DEGREE COLLEGE (A)

VIJAYAWADA, N.T.R. DT.

(NAAC Accredited with 'A' Grade-IV Cycle)

AFFILIATED TO KRISHNA UNIVERSITY, MACHILIPATNAM

DEPARTMENT OF PHYSICS & ELECTRONICS

ACADEMIC YEAR 2024-25

Composition of the Board Of Studies (BoS) of ELECTRONICS as Per UGC Guidelines

Members of Board of studies

Members of the Board of Studies of Department of Electronics met on 30 -04-2024 at 3.00 PM in the Department of Physics & Electronics staff room.

S.No	Name of the faculty	Designation
1	Smt.P.Sailaja, In- Charge, Department of Physics & Electronics SRR & CVR GDC (A), Vijayawada	Board of studies chairperson
2	Prof. M.Rami Reddy, Acharya Nagarjuna University, Nagarjuna Nagar	University Nominee
3	K. Ajay Kumar, Lecturer in Physics GDC, Eluru, Eluru Dist. Mob:9493474612	Subject Expert
4	Dr.P. Gopi Krishna, Asst. Professor, Dept of ECM K.L. Education Foundation, Vaddeswaram, Guntur Ph:9963696066	Subject Expert
5	N. Vara Prasad, CEO, ARETE IT Services Pvt. Ltd Mob:8885591199	Industrialist
6	T.Pujitha, M.Sc Mob:7799467493	Alumni
7	1. Dr. B.Nagamani, Lecturer in Physics 2. Smt. T.V.VakulaPriya, Lecturer in Physics 3. Dr. J.Nageswara Rao , Lecturer in Physics 4. Dr. A. Asirvadam, Lecturer in Physics 5. Sri.T.Devender Reddy, Lecturer in Physics 6. Sri G.V.Gangadhara Rao, Lecturer in Physics	Members of the Department
8	1. M. Narendra III B.Sc (MECs) 2. M.Chandra Sekhar III B.Sc (MECs)	Students



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DEPARTMENT OF PHYSICS & ELECTRONICS

ACADEMIC YEAR 2024-25

Members of the Board of Studies of Department of Electronics met on 30 -04-2024 at 3.00 PM in the Department of Physics & Electronics staff room Under chairmanship of Smt. P.Sailaja, In-charge of the Department, with the following agenda.

AGENDA:

1. Review of minutes of BOS.
2. To apprise and approve Departmental Vision and mission.
3. To discuss and approve curriculum structure suggested by APSCHE and from feedback of students and different stakeholders with modifications not exceeding 20% on demand of local needs and to be implemented from the year 2024-25.
4. To approve blue print and Model Question paper for theory and practical examinations.
5. Review of evaluation of Internal and External Examinations.
6. To Suggest Methodologies and innovative teaching practices.
7. To discuss and approve panel of Examiners.
8. To suggest and approve student study projects, Extension activities curricular, co-curricular activities and to discuss about certificate course.
9. Any other with the permission of the chairperson.



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DEPARTMENT OF PHYSICS & ELECTRONICS

ACADEMIC YEAR 2024-25

Programme: B.Sc. Honours in Electronics (Major)

w.e.f. AY 2023-24 COURSE STRUCTURE

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
II	III	5	Semiconductor devices and Materials	3	3
			Semiconductor devices and Materials Practical Course	2	1
		6	Digital Electronics	3	3
			Digital Electronics Practical Course	2	1
		7	Analog Electronics	3	3
			Analog Electronics Practical Course	2	1
		8	Electronic communication system	3	3
			Electronic communication system Practical Course	2	1
	IV	9	Electrical and electronics instrumentation	3	3
			Electrical and electronics instrumentation Practical Course	2	1
		10	Microcontroller system	3	3
			Microcontroller system Practical Course	2	1
		11	Microprocessor system	3	3
			Microprocessor system Practical Course	2	1

Year	Semester	Course	Title of the Course	No. of Hrs/Week	No. of Credits
II	3	MDC	Basic Electronics	2	2



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DEPARTMENT OF PHYSICS & ELECTRONICS

ACADEMIC YEAR 2024-25

SEMESTER-III

COURSE 5: SEMICONDUCTOR DEVICES AND MATERIALS

Theory

Credits: 3

3 hrs/week

Objective:

1. To provide basic knowledge and concepts of Semiconductor materials and devices.
2. To facilitate students, learn on the physical principles and operational characteristics of Semiconductor devices and some of its important applications. Pre-requisites: Basic understanding of semiconductors.

Outcomes:

1. Ability to apply basic concepts of Inorganic and Organic Semiconductor materials for electronic device application in modern electronic industry.
2. Detailed knowledge of various classifications and applications to VLSI, LEDs and solar cells.
3. Holistic view of the latest progress in two-dimensional (2D)-one-dimensional (1D) and nano materials.
4. Emphasis on nano-electronic applications such as Schottky barrier transistors, flexible Electronics.

Unit I

Inorganic and Organic Semiconductor: Energy bands, Organic Semiconductor: carrier transport, mobility, drift- diffusivity, excess carrier, injection and recombination of the excess carriers, carrier statistics; High field effects: velocity saturation, hot carriers and avalanche breakdown.

Unit II

Majority carrier Devices: MS contacts rectifier and non-rectifier, MIS structures, MESFET, hetero-junction, HEMT and band diagrams, I-V and C-V characteristics.

Unit III

MOS structures: Semiconductor surfaces; The ideal and non-ideal MOS capacitor band diagrams and CVs; Effects of oxide charges, defects and interface states. MOSFET: Structures and Device Characteristics, Short-Channel effects. Charge coupled Devices (CCDs), application to VLSI.

Unit IV

Nonvolatile Memory Device. Optoelectronic Devices: solar cell, photo detectors, LEDs. Nano structures and concepts: quantum wells, Nano rod, quantum dot, CNTs, 2D materials: grapheme, BN, MoS₂ etc, meta materials.

UNIT-V

Multistage Amplifiers: BJT at high frequencies, frequency response of RC coupled amplifiers and transformer coupled amplifier.

Reference Books

1. Donald A. Neamen, Semiconductor Physics and Devices Basic Principles, 3rdedn.McGraw-Hil (2003)
2. B.G. Streetman and Sanjay Banerjee, Solid State Electronic Devices, 6thEdn., Prentice Hall, 2006.
3. S. M. Sze and Kwok K. Ng Physics of Semiconductor Devices, Wiley (2013).
4. M. Hussa, A. Dimoulas and A. Molle, 2D Materials for Nano Electronics, CRC press (2016)
5. M.S.Tyagi, Introduction to Semiconductor Materials and Devices, Willey, Student Edition

SEMESTER-III

COURSE 5: SEMICONDUCTOR DEVICES AND MATERIALS

Practical

Credits: 1

2 hrs/week

List of Experiments

1. To study the Hall Effect: determine the Hall coefficient, type of semiconductor and carrier concentration in the given semiconductor sample.
2. To study energy band gap of given semiconductor sample.
3. To determine the resistivity of the given semiconductor specimen.
4. To design a MOSFET as switching regulator for given duty cycle and plot the current-voltage (I-V) characteristic of MOSFET.
5. To design a phase-controlled rectifier using SCR and plot the I-V characteristic of SCR.
6. To design a relaxation oscillator using UJT and plot the I-V characteristic of UJT. (2N2646)
7. I-V characteristics measurement of a P-N diode – calculate ideality factor.
8. I-V characteristics measurement of a LEDs - calculate its ideality factor.

SEMESTER-3
COURSE 5: SEMICONDUCTOR DEVICES AND MATERIALS

Theory

Credits:3

3 hrs/week

COURSE 5: BLUE PRINT

Unit	Essay answer questions	Short answer questions	Numerical problem
Unit I	2 (with internal choice)	2	0
Unit II	2 (with internal choice)	2	0
Unit III	2 (with internal choice)	2	0
Unit IV	2 (with internal choice)	2	0
Unit V	2 (with internal choice)	2	0

(ELE M 3303-5)
S.R.R & C.V.R. GOVERNMENT DEGREE COLLEGE (A) VIJAYAWADA
B.Sc (ELECTRONICS)
SEMESTER-3

MODEL QUESTION PAPER

COURSE 5: SEMICONDUCTOR DEVICES AND MATERIALS

Time: 3 hours

Max marks: 60M

Section-A

Answer any Five of the following Questions

5X4=20 Marks

1. What is Velocity Saturation?
2. Explain mobility in Organic Semiconductors.
3. Non-Rectifying MS Contacts (Ohmic Contacts)
4. HEMT (High Electron Mobility Transistor) and Band Diagrams
5. Discuss the short-channel effects in MOSFET.
6. Write applications to VLSI.
7. Discuss the structure of CNTs.
8. Explain the structure of graphene, BN, MoS₂
9. BJT at high frequencies
10. Explain multi stage amplifiers

SECTION-B

Answer all questions

5X8=40 Marks

11. Drift Diffusivity: Factors Affecting Drift Diffusivity
Or
12. Discuss Excess Carriers in Organic Semiconductors
13. Explain the construction and working of MESFET. Draw V-I characteristics of a MESFET.
Or
14. Draw I-V characteristics of HEMT.
15. Discuss the construction and working of N-Type Depletion MOSFET.
Or
16. Discuss the short-channel effects in MOSFET.
17. Discuss the Construction and operation of Photodetector.
Or

18. What is LED? Explain the principle, construction and working of LED.

19. Frequency response of RC coupled amplifiers

Or

20. Transformer coupled amplifier.

SEMICONDUCTOR DEVICES AND MATERIALS QUESTION BANK

Unit-I

Short Answer Questions

1. Carrier Transport in Organic Semiconductors.
2. What is Velocity Saturation?
3. Explain mobility in Organic Semiconductors.

Essay Type Questions

1. Explain charge carrier mobility in organic materials.
2. Drift Diffusivity: Factors Affecting Drift Diffusivity
3. Discuss Excess Carriers in Organic Semiconductors
4. Hot Carriers in Organic Semiconductors

Unit-II

Short Answer Questions

1. Rectifying MS Contacts (Schottky Diodes)
2. Non-Rectifying MS Contacts (Ohmic Contacts)
3. HEMT (High Electron Mobility Transistor) and Band Diagrams
4. Briefly explain about Heterojunctions.

Essay Type Questions

1. Discuss about MIS structure when external voltage is zero.
2. Explain the construction and working of MESFET. Draw V-I characteristics of a MESFET.
3. Draw I-V characteristics of HEMT.
4. Draw C-V characteristics of HEMT.

Unit-III

Short Answer Questions

1. Explain the Characteristics for N-Type MOSFET.
2. Discuss the short-channel effects in MOSFET.
3. Write applications to VLSI.

Essay Type Questions

1. Explain the C-V Characteristic Curve of an ideal and non-ideal MOS capacitor.
2. Discuss the construction and working of N-Type Depletion MOSFET.
3. Discuss the short-channel effects in MOSFET.
4. Explain the construction and working principle of CCD.

Unit IV**Short Answer Questions**

1. Write a short note on Non- Volatile Memory.
2. Discuss the structure of CNTs.
3. Explain the structure of graphene, BN, MoS₂
4. Write a short note on meta materials.

Essay Type Questions

1. Explain the principle, construction and working of Solar Cell
2. Discuss the Construction and operation of Photodetector.
3. What is LED? Explain the principle, construction and working of LED.
4. Explain the structures of quantum wells, Nano rod, quantum dot.

Unit -V**Short Answer Questions**

1. BJT at high frequencies
2. Explain multi stage amplifiers

Essay Type Questions

1. Frequency response of RC coupled amplifiers
2. Transformer coupled amplifier.



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DEPARTMENT OF PHYSICS & ELECTRONICS

ACADEMIC YEAR 2024-25

SEMESTER-III

COURSE 6: DIGITAL ELECTRONICS

Theory	Credits: 3	3 hrs/week
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Objectives:

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

Unit – I

Number System And Codes:

Decimal, Binary, Hexadecimal, Octal. Codes: BCD and Gray codes- Complements (1's, 2's, 9's and 10's), Addition: Binary, code conversions: Decimal to Binary and Binary to Decimal, Binary to Hexa decimal and Hexa decimal to Binary. Subtraction using 1's complement method.

Unit- II

Boolean Algebra And Theorems:

Boolean Theorems, De-Morgan's laws. NAND & NOR gates. Minimization Techniques (Karnaugh Map Method: 2, 3 variables). Digital logic gates: X-OR gate and Universal Logic gates.

Unit-III

Combinational Digital Circuits:

Adders-Half & full adder, Subtractor-Half and full subtractors, Magnitude Comparator, Multiplexers (4:1) and Demultiplexers (1:4), Encoder (8- line-to-3- line) and Decoder (3- line-to-8-line). IC-LOGIC FAMILIES: TTL logic.

UNIT-IV

Sequential Digital Circuits:

Flip Flops: S-R FF, J-K FF, T and D type FFs, Master-Slave FFs, Excitation tables, Registers:- Serial In Serial Out and Parallel In and Parallel Out, Counters Asynchronous-, Mod-8, Mod- 10, Synchronous-4-bit & Ring counter.

UNIT V - MEMORY DEVICES:

General Memory Operations, ROM, RAM (Static and Dynamic), PROM, EPROM, EEPROM, EAROM.

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

Reference Books:

- (i) Herbert Taub and Donald Schilling. “Digital Integrated Electronics” .McGraw Hill. 1985.
- (ii) S.K. Bose. “Digital Systems”. 2/e. New Age International. 1992.
- (iii) D.K. Anvekar and B.S. Sonade. “Electronic Data Converters :Fundamentals & Applications”. TMH. 1994.
- (iv) *Malvino and Leach. “ Digital Principles and Applications”. TMG Hill Edition.*

Outcomes:-

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

SEMESTER-III

COURSE 6: DIGITAL ELECTRONICS

Practical

Credits: 1

2 hrs/week

LAB LIST:

1. Verification of IC-Basic logic gates
2. Realization of basic gates using discrete components (resistor, diodes & transistor)
3. Realization of basic gates using Universal gates (NAND & NOR gates)
4. Verify Half adder and full adder using gates
5. Verify Half subtractor and full subtractor using gates.
6. Verify the truth table Multiplexer and demultiplexer.
7. Verify the truth table Encoder and decoder.
8. Verify the truth table of RS , JK, T-F/F using NAND gates
9. 4-bit binary parallel adder and subtractor using IC 7483
10. BCD to Seven Segment Decoder using IC -7447/7448

SEMESTER-3
COURSE 6: DIGITAL ELECTRONICS

Theory

Credits:3

3 hrs/week

COURSE 1: BLUE PRINT

Unit	Essay answer questions	Short answer questions	Numerical problem
Unit I	2 (with internal choice)	1	1
Unit II	2 (with internal choice)	2	0
Unit III	2 (with internal choice)	2	0
Unit IV	2 (with internal choice)	2	0
Unit V	2 (with internal choice)	2	0

(ELE M 3303-6)
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B.Sc (ELECTRONICS)
SEMESTER-3
MODEL QUESTION PAPER
COURSE 6: DIGITAL ELECTRONICS

Time: 3 hours

Max marks: 60M

Section-A

Answer any Five of the following Questions

5X4=20 Marks

1. Convert a Hexa decimal number to Binary number with an example.
2. Binary to decimal conversion with at least two examples.
3. Explain in detail about X-OR gates with truth tables
4. Explain in detail about NAND and NOR gates with truth tables.
5. Explain the construction and working of Magnitude Comparator.
6. Briefly explain Multiplexers.
7. Explain construction and working of D -type Flip-flop.
8. Describe the Mod-8 Asynchronous Counters.
9. Briefly explain PROM.
10. Briefly explain EPROM.

SECTION-B

Answer all questions

5X8=40 Marks

11. Decimal to binary conversion with at least two examples.
Or
12. Problems on binary addition with two examples.
13. Explain Minimization Techniques Karnaugh Map Method with 3 variables.
Or
14. Explain Minimization Techniques Karnaugh Map Method with 2 variables.
15. Briefly explain Encoder.
Or
16. Briefly explain Decoder.
17. Explain construction and working of J-K Flip-flop.
Or
18. Describe the Mod-10 Asynchronous Counters.
19. Describe the construction and working of ROM.
Or
20. Programmable Logic Array (PLA).

COURSE 6: DIGITAL ELECTRONICS

QUESTION BANK

UNIT-1

Short Essay Questions

- 1 Convert a Binary number to Hexa decimal with an example.
- 2 Convert a Hexa decimal number to Binary number with an example
- 3 Binary to decimal conversion with at least two examples.
- 4 Explain in detail about BCD and Gray code.

Essay type Questions

- 1 Problems on binary addition with two examples..
- 2 Decimal to binary conversion with at least two examples.
- 3 Problems on binary subtraction in 1's compliment method.

UNIT-2

Short Essay Questions

- 1 Explain Boolean theorems.
- 2 Explain in detail about X-OR gates with truth tables.
- 3 Explain in detail about NAND and NOR gates with truth tables.
- 4 Show that NAND and NOR gates are universal gates.

Essay type Questions

- 1 State and prove De-Morgan laws.
- 2 Explain Minimization Techniques Karnaugh Map Method with 3variables.
- 3 Explain Minimization Techniques Karnaugh Map Method with 2 variables.

UNIT-3

Short Essay Questions

- 1 Describe the Half and Full subtractors.
- 2 Explain the construction and working of Magnitude Comparator.
- 3 Briefly explain Multiplexers
- 4 Briefly explain Demultiplexer.

Essay type Questions

- 1 Describe Half adder and Full adder.
- 2 Briefly explain Encoder
- 3 Briefly explain Decoder.

UNIT-4

Short Essay Questions

- 1 Explain construction and working of T-Flip-flos.
- 2 Explain construction and working of D -type Flip-flop.
- 3 Describe the Mod-8 Asynchronous Counters.
- 4 Describe Serial In Serial Out and Parallel In and Parallel Out Registers.

Essay type Questions

- 1 Explain construction and working of S-R Flip-flop.
- 2 Explain construction and working of J-K Flip-flop.
- 3 Describe the Mod-10 Asynchronous Counters.
- 4 Describe the 4-Bit synchronous Counters.

UNIT-5

Short Essay Questions

- 1 Briefly explain EEPROM.
- 2 Briefly explain PROM
- 3 Briefly explain EPROM
- 4 Programmable Array Logic (PAL).

Essay type Questions

- 1 Describe the General Memory Operations.
- 2 Describe the construction and working of ROM.
- 3 Describe the RAM and its types.
- 4 Programmable Logic Array (PLA)



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DEPARTMENT OF PHYSICS & ELECTRONICS

ACADEMIC YEAR 2024-25

COURSE 7: ANALOG ELECTRONICS

Theory

Credits:3

3hrs/week

- a. The design and working of RC coupled amplifiers, transformer coupled amplifiers and power amplifiers,
- b. The concept of negative and positive feedback,
- c. The op-amp characteristics and its linear and non-linear applications.
- d. Oscillators and multivibrators.

UNIT-I

Amplifiers: - Classifications of amplifiers- Multistage amplifiers-RC Coupled amplifiers—construction - working-Frequency response-applications—Transformer coupled amplifiers construction- working - applications-

Class A and Class B power amplifiers - Single ended Class A amplifier and Class B push-pull amplifier– Power dissipation and output power calculations.

UNIT-II

Feedback Amplifiers: Basic concept of feedback amplifiers-Expression for gain with negative feedback-General characteristics of negative feedback amplifier -Effect of negative feedback on gain – Gain stability - Distortion and bandwidth - Input and output resistance in the case of various types of feedback.

UNIT-III

Operational Amplifiers: Principles -Ideal op amp characteristics- Differential Amplifier-Variations of op amp offset parameters- CMRR-Slew rate–Basic operational amplifier circuits under inverting and non- inverting modes.

UNIT-IV

Op-amp Circuits: Basic operational amplifier applications-Adder - Subtractor - Integrator - Differentiator - Comparator – Sine and square waveform generators.

Active filters-Low Pass and High pass filters

UNIT-V

Oscillators: Positive feedback-Barkhausen criterion for oscillation-Expression for gain Hartley-Colpitts oscillators -Condition for oscillation and frequency derivation - Monostable and bistable multivibrators- Schmitt trigger.

Text Books:

1. Introduction to Integrated Electronics - *V. Vijayendran*, S.Viswanathan (Printers &Publishers) Pvt. Ltd., Chennai, 2005.
2. Electronic Circuits and Systems - *Y.N. Bapat*, Tata McGraw Hill Publishing Co. Ltd.

Reference Books:

1. Electronic Devices and Circuits - *G.K. Mithal*, Khanna Publishers, Delhi.
2. Hand Book of Electronics - *Gupta & Kumar*, Pragati Prakashan, Meerut.
3. Electronic Devices and Circuit Theory - *R. Boylestad & L. Nashelsky*, Prentice Hall of India Private Limited, 6/e.
4. Electronic Devices and Circuits - *J.P. Agarwal & Amit Agarwal*,Prakasam Publishers.
5. Linear Integrated Circuits - *D. Roy Choudhury & Shail Jain*, New Age International
6. (P) Limited.

COURSE 7: ANALOG ELECTRONICS

Practical

Credits: 1

2hrs/week

LAB LIST:

Any Six experiments should be done

1. Frequency response of R-C coupled Amplifier.
2. Op Amp inverting and Non inverting.
3. Op Amp Adder and Subtractor.
4. Op Amp integrator and differentiator.
5. Astable multivibrator using Op Amp
6. Monostable multivibrator using Op Amp
7. Colpitts Oscillator using Op Amp.
8. Op Amp CMRR and Slew rate.
9. Frequency response of Low pass filter.
10. Frequency response of high pass filter.

SEMESTER-3
COURSE 7: ANALOG ELECTRONICS

Theory

Credits:3

3 hrs/week

COURSE 1: BLUE PRINT

Unit	Essay answer questions	Short answer questions	Numerical problem
Unit I	2 (with internal choice)	2	0
Unit II	2 (with internal choice)	2	0
Unit III	2 (with internal choice)	2	0
Unit IV	2 (with internal choice)	2	0
Unit V	2 (with internal choice)	1	1

(PHY M 3303-3)
S.R.R & C.V.R. GOVERNMENT DEGREE COLLEGE (A) VIJAYAWADA
B.Sc (PHYSICS)
SEMESTER-3

MODEL QUESTION PAPER
COURSE 7: ANALOG ELECTRONICS

Time: 3 hours

Max marks: 60M

Section-A

Answer any five of the following

5X4=20M

1. Explain the frequency response of R-C coupled amplifier.
2. Explain about multistage amplifiers.
3. Compare positive and negative feedback.
4. Explain the effect of negative feedback on distortion and bandwidth.
5. Explain virtual ground in op amp.
6. Define CMRR and slew rate.
7. Explain op amp as adder.
8. Explain integrator circuit using op amp.
9. Explain Barkhausen criterion for oscillations.
10. Explain Schmitt trigger.

Section-B

Answer ALL the questions.

5X8=40M

11. Explain the construction and working of R-C coupled amplifier.

Or

12. Explain the single ended Transformer coupled class A amplifier.
13. Explain the general characteristics of negative feedback amplifier.

Or

14. Explain the effect of input and output resistance in the case of various types of feedback.
15. Explain the non-inverting operational amplifier circuit and deduce the gain with feedback.

Or

16. Explain differential amplifier and derive expression for output voltage.
17. Explain sine wave generator (Wein bridge oscillator).

Or

18. Explain low pass filter with neat circuit diagram and its frequency response.
19. Explain Hartley oscillator and derive Condition for oscillation and frequency.

Or

20. Explain bistable multivibrator circuit using op amp.

SEMESTER-III
COURSE 7: ANALOG ELECTRONICS
Question Bank

UNIT-1
ESSAY QUESTIONS

1. Explain the classification of amplifiers.
2. Explain the construction and working of R-C coupled amplifier.
3. Explain the construction and working of transformer coupled amplifier.
4. Explain the single ended Transformer coupled class A amplifier.
5. Explain the working of class B push pull amplifier and derive the expression for its efficiency.

UNIT-I
SHORT ANSWER QUESTIONS

1. Explain the frequency response of R-C coupled amplifier.
2. Explain about multistage amplifiers.
3. Derive the expression for efficiency of class A power amplifier.
4. What are the applications of R-C coupled amplifier.

UNIT-II
ESSAY QUESTIONS

1. Explain the general characteristics of negative feedback amplifier.
2. Define feedback. Derive the expression for gain with negative feedback.
3. Explain the effect of input and output resistance in the case of various types of feedback.

UNIT-II
SHORT ANSWER QUESTIONS

1. Compare positive and negative feedback.
2. Explain the effect of negative feedback on gain and gain stability.
3. Explain the effect of negative feedback on distortion and bandwidth.
4. Explain the basic concept of feedback amplifiers.

UNIT-III
ESSAY QUESTIONS

1. Explain the inverting operational amplifier circuit and deduce the gain with feedback.
2. Explain the non inverting operational amplifier circuit and deduce the gain with feedback.
3. Explain differential amplifier and derive expression for output voltage.

UNIT-III
SHORT ANSWER QUESTIONS

1. Mention ideal op amp characteristics.
2. Explain virtual ground in op amp.
3. Define op amp parameters.

4. Define CMRR and slew rate.

5. Find the output voltage V_o of an op Amp inverting amplifier if input voltage $V_i = 0.5V$, $R = 5K\Omega$ and $R_f = 100K\Omega$.

UNIT-IV

ESSAY QUESTIONS

1. Explain sine wave generator (Wein bridge oscillator).
2. Explain astable multivibrator to generate square wave form.
3. Explain low pass filter with neat circuit diagram and its frequency response.
4. Explain high pass filter with neat circuit diagram and its frequency response.

UNIT-IV

SHORT ANSWER QUESTIONS

1. Explain op amp as adder.
2. Explain op amp as subtractor.
3. Explain integrator circuit using op amp.
4. Explain differentiator circuit using op amp.
5. Explain comparator circuit using op amp.

UNIT-V

ESSAY QUESTIONS

1. Explain Colpitts oscillator and derive Condition for oscillation and frequency.
2. Explain Hartley oscillator and derive Condition for oscillation and frequency.
3. Explain monostable multivibrator circuit using op amp.
4. Explain bistable multivibrator circuit using op amp.

UNIT-V

SHORT ANSWER QUESTIONS

1. Explain positive feedback.
2. Explain Barkhausen criterion for oscillations.
3. Derive the gain for positive feedback.
4. Explain Schmitt trigger.



S.R.R. & C.V.R. GOVT. DEGREE COLLEGE (A)

VIJAYAWADA, N.T.R. DT.

(NAAC Accredited with 'A' Grade-IV Cycle)

AFFILIATED TO KRISHNA UNIVERSITY, MACHILIPATNAM

DEPARTMENT OF PHYSICS & ELECTRONICS

ACADEMIC YEAR 2024-25

SEMESTER-III

COURSE8: ELECTRONIC COMMUNICATION SYSTEMS

Theory

Credits:3

3 hrs/week

The students will learn:

- A. Fundamentals of antenna, their characteristics and types,
- B. amplitude modulation and demodulation and radio wave transmission and reception,
- C. frequency modulation and demodulation and FM Radio wave transmission and reception,
- D. Principle of analog and digital pulse modulation and their applications,
- E. Transmission and detection of digital signals.

UNIT-I

Antenna-Effective resistance- Efficiency-Directive gain-Bandwidth, Beam width and polarization - Dipole - Folded dipole - Arrays - Yagi - Uda - Parabolic - Dish Antennas.

Ground wave, sky wave and space wave propagation – Skip distance-Maximum usable frequency.

UNIT-II

Modulation-Need for Modulation-Types of Modulation-Amplitude Modulation- Frequency spectrum of AM wave - Power relations in AM-Current relations in AM wave- Modulation index- Generation of AM-Transistor modulator- and detection circuit -Diode detector- Block diagram of AM Radio transmitter and Super heterodyne AM Receiver.

UNIT-III

Frequency Modulation-Definition-Derivation of Modulated wave -modulation index-Generation of FM - Varactor diode Modulator –FM Detector –Phase locked loop.

Block diagram of FM transmitter and Super heterodyne FM receiver.

UNIT-IV

Pulse Modulation-Sampling theorem-PAM, PWM, PCM-quantizing, sampling, coding, decoding, quantization error.

UNIT-V

Multiplexing-FDM, TDM, CDMA.

ASK, FSK, PSK–Advantages of Digital Communication.

Text Books

1. Electronic Communication Systems - *George Kennedy*, McGraw Hill Book Company, 4/e, 2005.
2. Communication Engineering - *T.G. Palanivelu*, Anuradha Publications, 1/e, 2002.

Reference Books

1. Communication System - *Roddy & Coolen*, 4/e, Pearson Education, 2005.
2. Principles of Communication Engineering - *Anok Singh*, 4/e, Sathyaprakasam Publications, 2004.
3. Electronic Communication Systems *Wayne Tomasi*, 4/e, Pearson Education, 2004.

SEMESTER-III
COURSE8: ELECTRONIC COMMUNICATION SYSTEMS

Practical	Credits: 1	2hrs/week
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LAB LIST:

- 1.AM modulation
- 2.AM demodulation.
- 3.FM modulation
4. FM demodulation.
5. Pulse amplitude modulation
6. Pulse width modulation
7. Pulse code modulation
8. Study of different antennas
9. Study of AM receiver
10. Study of FM receiver

Note: Any Six experiments should be done.

SEMESTER-III
COURSE 8: ELECTRONIC COMMUNICATION SYSTEMS

Theory

Credits:3

3 hrs/week

COURSE 1: BLUE PRINT

Unit	Essay answer questions	Short answer questions	Numerical problem
Unit I	2 (with internal choice)	2	0
Unit II	2 (with internal choice)	2	0
Unit III	2 (with internal choice)	2	0
Unit IV	2 (with internal choice)	2	0
Unit V	2 (with internal choice)	2	0

(ELE M 3303-8)
S.R.R & C.V.R. GOVERNMENT DEGREE COLLEGE (A) VIJAYAWADA
B.Sc (ELECTRONICS)
SEMESTER-3
MODEL QUESTION PAPER
COURSE 8: ELECTRONIC COMMUNICATION SYSTEMS

Time: 3 hours

Max marks: 60M

Section-A

Answer any five of the following

5X4=20M

1. Explain Directive gain and Bandwidth.
2. Explain Skip distance.
3. Explain diode detector
4. Find modulation Index if amplitude change of carrier wave is 3 KHz and carrier frequency is 60 KHz.
5. Derive the expression for FM.
6. Distinguish between AM & FM.
7. What are the advantages of pulse modulation.
8. Explain sampling theorem.
9. Explain CDMA.
10. What are the advantages of digital communication.

Section-B

Answer ALL the questions.

5X8=40M

11. Explain about Yagi-uda antenna.

Or

12. Explain space wave propagation.

13. What is Amplitude Modulation? How can you generate AM wave by using transistor modulator?

Or

14. Draw the block diagram of AM transmitter and explain.

15. What is demodulation. How can you demodulate FM signal by using PLL?

Or

16. Draw the block diagram of Super heterodyne FM receiver and explain.

17. Explain pulse amplitude modulation.

or

18. Explain pulse code modulation.

19. Explain frequency division multiplexing.

or

20. Explain amplitude shift keying.

SEMESTER-III
COURSE 8: ELECTRONIC COMMUNICATION SYSTEMS
Question Bank

UNIT-I
ESSAY QUESTIONS

1. Explain about folded dipole antenna.
2. Explain about Yagi-uda antenna.
3. Explain about dish antenna.
4. Explain ground wave propagation.
5. Explain space wave propagation.
6. Explain sky wave propagation.

UNIT-I
SHORT ANSWER QUESTIONS

1. Explain Effective resistance and Efficiency.
2. Explain Directive gain and Bandwidth.
3. Explain Beam width and polarization.
4. Explain Skip distance.
5. Explain Maximum usable frequency.

UNIT-II
ESSAY QUESTIONS

1. What is Amplitude Modulation. How can you generate AM wave by using transistor modulator?
2. What is amplitude modulation. Explain mathematical analysis of AM wave.
3. Draw the block diagram of super heterodyne receiver and explain.
4. Draw the block diagram of AM transmitter and explain.

UNIT-II
SHORT ANSWER QUESTIONS

1. Explain need for modulation.
2. Distinguish between AM & FM
3. Explain frequency spectrum of AM?
4. Find the expression for power in AM?
5. Explain diode detector.
6. Find modulation Index if amplitude change of carrier wave is 3 KHz and carrier frequency is 60 KHz.

UNIT-III
ESSAY QUESTIONS

1. What is frequency Modulation. How can you generate FM wave by using varactor diode modulator?
2. What is demodulation. How can you demodulate FM signal by using PLL?
3. Draw the block diagram of FM transmitter and explain.
4. Draw the block diagram of Super heterodyne FM receiver and explain.

UNIT-III
SHORT ANSWER QUESTIONS

1. Derive the expression for FM.
2. Define frequency modulation and modulation index.
3. Distinguish between AM & FM.

UNIT-IV
ESSAY QUESTIONS

1. Explain pulse amplitude modulation.
2. Explain pulse width modulation.
3. Explain pulse code modulation.

UNIT-IV
SHORT ANSWER QUESTIONS

1. What are the advantages of pulse modulation.
2. Compare PAM and PWM.
3. Explain sampling theorem.
4. Explain quantization error.

UNIT-V
ESSAY QUESTIONS

1. Explain frequency division multiplexing.
2. Explain time division multiplexing.
3. Explain amplitude shift keying.
4. Explain frequency shift keying

UNIT-V

SHORT ANSWER QUESTIONS

1. Define multiplexing. What are the advantages of multiplexing?
2. Explain CDMA.
3. Explain PSK.
4. What are the advantages of digital communication.



S.R.R. & C.V.R. GOVT. DEGREE COLLEGE (A)

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DEPARTMENT OF PHYSICS & ELECTRONICS

ACADEMIC YEAR 2024-25

SEMESTER-IV

COURSE 9: ELECTRICAL AND ELECTRONIC INSTRUMENTATION

Theory

Credits: 3

3 hrs/week

The students will learn :

1. basic concepts of indicating instruments.
2. various electronic instruments such as CRO, storage oscilloscopes, function generators, spectrum analyzer etc.,
3. transducers, sensors and display devices.

UNIT-I

DC and AC indicating Instruments: Accuracy and precision - Types of errors -PMMC galvanometer, - Conversion of Galvanometer into ammeter, Voltmeter and Shunt type ohmmeter.

Electrodynamometer - Thermocouple instrument - Electrostatic voltmeter - Watt-hour meter.

UNIT-II

AC bridges: Wheatstone bridge -- Balancing condition for AC bridge-Maxwell's bridge-Hay's bridge -De-Sauty's bridge- Schering's bridge-Wein's bridge- Determination of frequency.

UNIT-III

Oscilloscopes: Block diagram of CRO – Cathode ray tube- Electron gun assembly, horizontal and vertical deflection systems, - CRT Screen - Measurement of Waveform frequency, phase difference, AC voltage, DC voltage and Time intervals -Analog and Digital Storage Oscilloscopes.

UNIT-IV

Instrumentation Amplifiers and Signal Analysers: Instrumentation amplifier- Digital Multimeter - Digital Voltmeter - Function Generator –Basic Wave Analyser - Fundamentals of Spectrum Analyser.

UNIT-V

Transducers: Strain Gauge - Unbounded Strain Gauge - LVDT -Resistance Thermometer -

Photoelectric Transducer - Pen Recorder - Audio Tape Recorder-

Text Books

1. Electronic Instrumentation and Measurement Techniques - *W.D. Coope & A.D. Helfrick*, Prentice Hall of India.
2. Electronic Instrumentation and Measurement - *Kalasi*.

Reference Books

1. A Course in Electrical and Electronic Measurement and Instrumentation - *A.K. Sawhney*, Dhanpat Rai and Sons.
2. Electronic Instrumentation and Measurements - *P.B. Zbar*, Mc Graw Hill International.
3. Measurement Systems Application and Design - *Ernest O. Doebelin*, 4/e, Tata Mc Graw Hill Publishing Co. LTD

SEMESTER-IV
COURSE 9: ELECTRICAL AND ELECTRONIC INSTRUMENTATION

Practical	Credits: 1	2hrs/week
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LAB LIST:

1. Verify Galvanometer as voltmeter.
2. Verify Galvanometer as ammeter.
3. Measurement of resistance using Wheatstone bridge.
4. Measurement of inductance value using Maxwell's bridge.
5. Measurement of capacitance using De-Sauty's bridge.
6. Measurement of frequency using Wein's bridge.
7. Measurement of AC voltage, DC voltage and frequency using CRO.
8. Measurement of phase using CRO.
9. Study of function generator.
10. Study of Digital multimeter.



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DEPARTMENT OF PHYSICS & ELECTRONICS

ACADEMIC YEAR 2024-25

SEMESTER-4

COURSE 9: ELECTRICAL AND ELECTRONIC INSTRUMENTATION

Theory

Credits:4

5hrs/week

COURSE 1: BLUE PRINT

Unit	Essay answer questions	Short answer questions	Numerical problem
Unit I	2 (with internal choice)	2	0
Unit II	2 (with internal choice)	2	0
Unit III	2 (with internal choice)	2	0
Unit IV	2 (with internal choice)	2	0
Unit V	2 (with internal choice)	2	0

(ELE M 4303-9)
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B.Sc (ELECTRONICS)
SEMESTER-4
MODEL QUESTION PAPER
COURSE 9: ELECTRICAL AND ELECTRONIC INSTRUMENTATION

Time: 3 hours

Max marks: 60M

SECTION-A

Answer any FIVE of the following.

5X4=20M

1. Explain accuracy and precision.
2. Explain Electrostatic voltmeter.
3. Derive the balancing bridge condition using Wheatstone bridge.
4. Explain the working of Hey's bridge.
5. Explain the measurement of Phase using CRO.
6. Mention the applications of CRO.
7. Explain about digital voltmeter.
8. Mention the fundamentals of spectrum analyser.
9. Explain about Pen recorder.
10. Explain about Resistance thermometer.

SECTION-B

Answer all the questions

5X8=40M

11. Explain the construction and working of PMMC galvanometer.
Or
12. Explain the construction and working of Electrodynamometer.
13. How do you measure inductance using Maxwell's bridge.
Or
14. How do you measure frequency using Wein's bridge.
15. Draw the block diagram of CRO and explain its each block.
Or
16. Explain briefly about analog and digital Storage oscilloscopes.
17. Explain briefly about instrumentation amplifier.
or
18. Explain about function generator.
19. Explain about unbounded strain gauge.
or
20. Explain about Photo electric transducer.

SEMESTER-IV
COURSE9: ELECTRICAL AND ELECTRONIC INSTRUMENTATION
QUESTION BANK

UNIT-I

Essay questions

1. Explain the construction and working of PMMC galvanometer.
2. Explain the conversion galvanometer into voltmeter and ammeter.
3. Explain the construction and working of Electrodynamometer.
4. Explain the construction and working of thermocouple instrument.

UNIT-I

Short answer questions

1. Explain accuracy and precision.
2. Explain types of errors.
3. Explain the conversion galvanometer into shunt type ohm meter.
4. Explain Electrostatic voltmeter
5. Explain Watt-hour meter.

UNIT-II

Essay questions

1. Explain the construction and working of Hey's bridge.
2. How do you measure inductance using Maxwell's bridge.
3. Explain the construction and working of Schering bridge.
4. How do you measure frequency using Wein's bridge.

UNIT-II

Short answer questions

1. How do you measure capacitance using De- Sauty's bridge.
2. Derive the balancing bridge condition using Wheatstone bridge.
3. Explain the working of Hey's bridge.

UNIT-III

Essay questions

1. Draw the block diagram of CRO and explain its each block.
2. Explain the CRT with neat diagram.
3. Explain the measurement of dc voltage, ac voltage and frequency using CRO.
4. Explain briefly about analog and digital Storage oscilloscopes.

UNIT-III

Short Answer questions

1. Explain About electron gun assembly.
2. Explain about horizontal and vertical deflecting plate assembly.
3. Explain the measurement of Phase using CRO.

4. Mention the applications of CRO.

UNIT-IV

Essay questions

1. Explain briefly about instrumentation amplifier.
2. Explain about digital multimeter.
3. Explain about function generator.
4. Explain briefly about basic wave analyser.

UNIT-IV

Short Answer questions

1. Explain about digital voltmeter.
2. Mention the fundamentals of spectrum analyser.
3. What are the advantages of digital devices over analog devices?

UNIT-V

Essay questions

1. Explain about Strain gauge.
2. Explain about unbounded strain gauge.
3. Explain about audio tape recorder.
4. Explain about Photo electric transducer.

UNIT-V

Short Answer questions

1. Explain about Pen recorder.
2. Explain about Resistance thermometer.
3. What are the advantages of transducers?



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DEPARTMENT OF PHYSICS & ELECTRONICS

ACADEMIC YEAR 2024-25

SEMESTER-IV COURSE 10: MICRO CONTROLLER SYSTEM

Theory _____ Credits: 3 _____ 3 hrs/week

OBJECTIVES:

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

UNIT-I: (10Hrs) Introduction, comparison of Microprocessor and micro controller, Evolution of microcontrollers from 4-bit to 32-bit, Development tools for microcontrollers –Assembler, Compiler, Simulator/Debugger.

Microcontroller Architecture: Overview and block diagram of 8051, Architecture of 8051- PSW register,

UNIT-II:(10Hrs)

Memory organization and Pin diagram- program counter-memory organization-data memory-program memory – Register banks-Data types and directives - stack pointer, pin diagram of 8051- Port organization, Interrupts.

UNIT-III:(10Hrs)

Addressing modes, instruction set of 8051: Addressing modes and accessing memory using various addressing modes, instruction set: Arithmetic, Logical, data transfer instructions-branch instructions -bit oriented instructions

Unit-IV:(15Hrs)

Assembly language programming Examples: Addition, Multiplication, Subtraction, division,

nibble exchange - largest/smallest number in an array.

Time delay generation and calculation, Timer/Counter Programming-mode 0, mode 1- mode2.

UNIT-V:(15Hrs)

Interfacing and Application of Microcontroller: Interfacing of – PPI 8255, DAC (0804), Temperature measurement (LM35), interfacing seven segment displays, displaying information on a LCD, control of a stepper Motor (Uni-Polar).

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Microcontrollers Architecture Programming, Interfacing and SystemDesign – Rajkamal.
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

OUTCOMES:

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



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DEPARTMENT OF PHYSICS & ELECTRONICS

ACADEMIC YEAR 2024-25

SEMESTER-IV

COURSE 10: MICRO CONTROLLER SYSTEM

Practical

Credits: 1

2 hrs/week

LAB LIST:

1. Addition And Subtraction Of Two 8-Bit Numbers.
2. Multiplication And Division Of Two 8-Bit Numbers.
3. Largest number /smallest in an array.
4. Exchange Of Higher And Lower Nibbles In Accumulator.
5. Addition Of Two 8-Bit Numbers (Keil Software).
6. Addition Of Two 16-Bt Numbers (Keil Software)
7. Subtraction Of Two 8-Bit Numbers (Keil Software).
8. Subtraction Of Two 16-Bit Numbers (Keil Software).
9. Multiplication Of Two 8-Bit Numbers (Keil Software).
11. Program For Swapping And Compliment Of 8-Bit Numbers (Keil Software).
12. Program To Find The Largest Number In Given Array (Keil Software).
13. Program To Find The Smallest Number In Given Array (Keil Software).
14. Interfacing Led To 8051 Microcontroller (Keil Software).
15. Interfacing Buzzer To 8051 Microcontroller (Keil Software).
16. Interfacing Relay To 8051 Microcontroller (Keil Software).
17. Interfacing Seven Segments To 8051 Microcontroller (Keil Software).

SEMESTER-4

COURSE 10: MICRO CONTROLLER SYSTEM

Theory

Credits:3

3 hrs/week

COURSE 10: BLUE PRINT

Unit	Essay answer questions	Short answer questions	Numerical problem
Unit I	2 (with internal choice)	2	0
Unit II	2 (with internal choice)	2	0
Unit III	2 (with internal choice)	2	0
Unit IV	2 (with internal choice)	2	0
Unit V	2 (with internal choice)	2	0

(ELE M 4303-10)
S.R.R & C.V.R. GOVERNMENT DEGREE COLLEGE (A) VIJAYAWADA
B.Sc (ELECTRONICS)
SEMESTER-4
MODEL QUESTION PAPER
COURSE 10: MICRO CONTROLLER SYSTEM

Time:3 hours

Max marks: 60M

Section-A

Answer any five of the following

5X4=20M

- 1.Comparison between microprocessor and microcontroller.
2. Write a short note on simulator.
- 3.Draw the pin diagram of 8051 microcontroller.
- 4.Explain data memory.
- 5.Explain logical instruction of 8051 microcontroller.
6. Explain the direct and indirect addressing modes of 8051 microcontroller.
7. Write an ALP for addition of two 8-bit numbers.
8. Write an ALP for multiplication of two 8-bit numbers.
9. Explain the interfacing of seven segment display.
10. Explain the interfacing of stepper motor.

Section-B

Answer all the questions

5X8=40M

11. Explain the evolution of 8051 microcontroller from 4-bit to 32-bit.
or

12. Draw the architecture of 8051 microcontroller and explain briefly.
13. Explain the memory organization of 8051 microcontroller.

Or

14. Explain the data types and directives of 8051 microcontroller.
15. Explain the addressing modes of 8051 microcontroller.

Or

16. Explain the arithmetic and logical instructions of 8051 microcontroller.
- 17.. Write an ALP to find the largest number in an array.

Or

18. Explain MODE 1 programming in 8051 microcontrollers.
19. Explain the interfacing of PPI 8255.

Or

20. Explain the interfacing of DAC 0804.

SRR & CVR GOVT.DEGREE COLLEGE (A), VIJAYAWADA
SEMESTER-1V, COURSE -10
TITLE: MICROCONTROLLER SYSTEMS
QUESTION BANK

UNIT-1

LONG ANSWER QUESTIONS

1. Explain the evolution of microcontroller from 4-bit to 32-bit.
2. Explain the development tools for microcontroller.
3. Draw the architecture of 8051 microcontroller and explain briefly.

SHORT ANSWER QUESTIONS

1. Compare microprocessor and microcontroller.
2. Write a short note on Assembler.
3. Write a short note on compiler.
4. Write a short note on simulator and debugger.
5. Draw the block diagram of 8051 microcontroller.
6. Explain PSW register.

UNIT-2

LONG ANSWER QUESTIONS

1. Explain the memory organization of 8051 microcontroller.
2. Draw the pin diagram of 8051 microcontroller and explain each pin.
3. Explain datatypes and directives.

SHORT ANSWER QUESTIONS

1. Explain register banks 8051
2. Explain data memory
3. Explain program memory.
4. Explain program counter.
5. Explain about stack pointer.
6. Draw the pin diagram of 8051 microcontroller.
7. Explain interrupts in 8051 microcontroller.

UNIT-3

LONG ANSWER QUESTIONS

1. Explain the addressing modes of 8051 microcontroller.
2. Explain the arithmetic and logical instructions of 8051 microcontroller.
3. Explain data transfer, branch and bit-oriented instructions of 8051 microcontroller.
4. Explain the instruction set of 8051 microcontrollers.

SHORT ANSWER QUESTIONS

1. Explain arithmetic instructions of 8051 microcontroller.
2. Explain logical instructions of 8051 microcontroller.
3. Explain data transfer instructions of 8051 microcontroller.
4. Explain direct and indirect addressing modes with examples.

UNIT-4

LONG ANSWER QUESTIONS:

1. Write an ALP to find the largest number in an array.
2. Write an ALP to find the smallest number in an array.
3. Explain time delay generation and calculation using 8051 timer.
4. Explain MODE 0 programming in 8051 microcontrollers.
5. Explain MODE 1 programming in 8051 microcontrollers.
6. Explain MODE 2 programming in 8051 microcontrollers.

SHORT ANSWER QUESTIONS

1. Write an ALP for addition of two 8-bit numbers.
2. Write an ALP for multiplication of two 8-bit numbers.
3. Write an ALP for subtraction of two 8-bit numbers.
4. Write an ALP for division of two 8-bit numbers.

UNIT-5

LONG ANSWER QUESTIONS:

1. Explain the interfacing of PPI 8255.
2. Explain the interfacing of DAC 0804.
3. Explain the interfacing of temperature measurement.
4. Explain the displaying information on a LCD.

SHORT ANSWER QUESTIONS

1. Explain the interfacing of seven segment display.
2. Explain the control of a stepper motor.



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DEPARTMENT OF PHYSICS & ELECTRONICS

ACADEMIC YEAR 2024-25

SEMESTER-IV

COURSE 11: MICROPROCESSOR SYSTEMS

Theory

Credits: 3

3 hrs/week

OBJECTIVES:

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

UNIT -I:

CPU Architecture: Introduction to Microprocessor, INTEL -8085 (μ p) Architecture, CPU, ALU unit, Register organization, Address, data and control Buses. Pin configuration of 8085. Addressing modes 8086 Microprocessor: Architecture, Pin description. Instruction format, Addressing modes.

UNIT -II:

8085 Instruction Set: Data transfer Instruction, Logical Instructions, Arithmetic Instructions, Branch Instructions, Machine Control instructions.

UNIT -III:

Assembly Language Programming using 8085: Programmes for Addition, Subtraction, Multiplication, Division, largest and smallest number in an array. BCD to ASCII and ASCII to BCD.

UNIT -IV:

Basic 8086 Configurations – Minimum mode and Maximum Mode, Serial Communication interface (8251 – USART), Programmable peripheral Interface (8255- PPI), Programmable Interval Timers (8253), Keyboard and display (8279), DMA controller (8237).

UNIT -V: ARM PROCESSOR: Introduction to 16/32-bit processors, Arm architecture & organization, Arm based MCUs, Programming model, Instruction set.

TEXTBOOKS

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

REFERENCES:

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

OUTCOMES:

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

SEMESTER-IV
COURSE 11: MICROPROCESSOR SYSTEMS

Practical

Credits: 1

2 hrs/week

List of Experiment

Programs using Intel 8085 /8086

1. Addition (8 bit and 16-bit)
2. Subtraction (8 bit and 16-bit)
3. Multiplication (8-bit)
4. Division (8-bit)
5. Largest number in an array.
6. Smallest number in an array.
7. BCD to ASCII.
8. ASCII to BCD .
9. Program to Convert Two BCD Numbers in to Hex
10. Program to Convert Hex Number in to BCD Number.
11. Program to Find the Square Root of a Given Number.
12. Interfacing Experiments Using 8086 Microprocessor (Demo):
 - a. Traffic Light Controller
 - b. Elevator,
 - c. 7-Segment Display

SEMESTER-4
COURSE 11: MICROPROCESSOR SYSTEMS

Theory

Credits:4

5hrs/week

COURSE 1: BLUE PRINT

Unit	Essay answer questions	Short answer questions	Numerical problem
Unit I	2 (with internal choice)	2	0
Unit II	2 (with internal choice)	2	0
Unit III	2 (with internal choice)	1	1
Unit IV	2 (with internal choice)	2	0
Unit V	2 (with internal choice)	2	0

(ELE M 4303-11)
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B.Sc (ELECTRONICS)
SEMESTER-4
MODEL QUESTION PAPER
COURSE 11: MICROPROCESSOR SYSTEMS

Time:3 hours

60M

Max marks:

Section-A

Answer any Five of the following Questions

5X4=20 Marks

1. Explain different registers available in 8085 microprocessor?
2. Draw the pin diagram of 8085 and mention the pin names?
3. Explain branch Instructions in 8085 microprocessor.
4. Explain Machine Control Instructions in 8085 microprocessor.
5. Write an ALP for multiplication of two 8bit numbers.
6. Write an ALP for BCD to ASCII.
7. Explain Minimum mode and Maximum Mode?
8. Explain Serial Communication interface (8251 – USART)
9. Explain instruction set for ARM processor?
10. Programming model for ARM processor?

SECTION-B

Answer all questions

5X8=40 Marks

11. Explain Intel 8085 microprocessor pin configuration with a neat diagram?
Or
12. Explain different addressing modes in 8085 microprocessor?
13. Explain Logical Instructions in 8085 microprocessor.
Or
14. Explain Arithmetic Instructions in 8085 microprocessor.
15. Write an ALP for subtraction of two 16-bit numbers.
Or
16. Write an ALP for largest number in an array.
17. Draw the block diagram of key board and display interface 8279?
Or
18. Draw the block diagram of Programmable interval timer 8253 and explain?
19. Explain ARM architecture with a neat diagram?
Or
20. Explain ARM based micro controller unit?

Microprocessor Systems

QUESTION BANK

Unit-1:

Long answer questions:

1. Explain Intel 8085 microprocessor architecture with a neat diagram?
2. Explain Intel 8085 microprocessor pin configuration with a neat diagram?
3. Explain different addressing modes in 8085 microprocessor?

Short answer questions:

21. Explain flag registers in 8085 microprocessor?
22. Explain different registers available in 8085 microprocessor?
23. Draw the pin diagram of 8085 and mention the pin names?
24. Explain general purpose registers in 8085?
25. Explain special purpose registers in 8085?

Unit-2:

Long answer questions:

1. Explain Data transfer Instructions in 8085 microprocessor.
2. Explain Logical Instructions in 8085 microprocessor.
3. Explain Arithmetic Instructions in 8085 microprocessor.

Short answer questions:

1. Explain branch Instructions in 8085 microprocessor.
2. Explain Machine Control Instructions in 8085 microprocessor.

Unit-3:

Long answer questions:

1. Write an ALP for addition of two 16-bit numbers.
2. Write an ALP for subtraction of two 16-bit numbers.
3. Write an ALP for largest number in an array.
4. Write an ALP for smallest number in an array.

Short answer questions:

1. Explain ADD M, ADD B, SBB M and SUB C.
2. Write an ALP for division of two 8-bit numbers.
3. Write an ALP for multiplication of two 8bit numbers.
4. Write an ALP for BCD to ASCII.
5. Write an ALP for ASCII to BCD.

Unit-4:

Long answer questions:

1. Draw the block diagram of PPI 8255 and explain?
2. Draw the block diagram of key board and display interface 8279?
3. Draw the block diagram of Programmable interval timer 8253 and explain?
4. Explain DMA controller with a neat diagram?

Short answer questions:

1. Explain briefly about DMA controller (8237)?
2. Explain Minimum mode and Maximum Mode?
3. Explain Serial Communication interface (8251 – USART)
4. Explain different types of interfacing in 8086?

Unit-5:

Long answer questions:

1. Explain ARM architecture with a neat diagram?
2. Explain ARM based micro controller unit?

Short answer questions:

1. Explain instruction set for ARM processor?
2. Programming model for ARM processor?

* * *



S.R.R. & C.V.R. GOVT. DEGREE COLLEGE (A)

VIJAYAWADA, N.T.R. DT.

(NAAC Accredited with 'A' Grade-IV Cycle)

AFFILIATED TO KRISHNA UNIVERSITY, MACHILIPATNAM

DEPARTMENT OF PHYSICS & ELECTRONICS

ACADEMIC YEAR 2024-25

MULTIDISCIPLINARY COURSE

w.e.f. AY 2023-24

semester-III

BASIC ELECTRONICS

Credits: 2

2 hrs/week

UNIT-I:

(10 hrs)

Brief History of Electronics, Voltage, Current & Resistance. Ohms Law,. Series and Parallel combination of resistors, Usage of Digital multimeter.

Batteries: lead acid batteries and Lithium – Ion Batteries. Basics of House wiring, Overloading, electrical circuit protection using Fuses, MCBs, earthing and its necessity,

UNIT-II:

(10 hrs)

Classification of solids according to electrical conductivity (Conductor, Semiconductor & Insulator). Intrinsic & Extrinsic Semiconductors . Diodes, Transistors,

Transducers and Sensors: Advantages, various parts, types, and applications, LED, IR LED, Photo Resistor & Photodiode (Symbol & applications of each). Home Appliances: Electric geyser, micro wave oven and refrigerator

UNIT-III:

(10 hrs)

Basics of Communication Systems: Transmitter, Receiver, Channel i) wired channels ii) wireless channels, Modulation, Demodulation.

Daily usage of Electronic Devices include: Mobile phones, Digital Camera, audio & video systems, TV (Television), Computer, Laptop, LED lights, GPS, iPod and Tablets, Wi-Fi and Internet.

Modulation-Definition, Demodulation-Definitions only.

Resource Material

- (1) Electrical technology by V.K. Mehta & Rohit Mehta (S. Chand & Company Pubs.)
- (2) Few references from Wikipedia free Encyclopedia.

SEMESTER-3
MULTIDISCIPLINARY COURSE

BASIC ELECTRONICS

Theory

Credits:2

2 hrs/week

COURSE 1: BLUE PRINT

Unit	Essay answer questions
Unit I	3
Unit II	3
Unit III	4

(MDC M 3303)
S.R.R & C.V.R. GOVERNMENT DEGREE COLLEGE (A) VIJAYAWADA
SEMESTER-3
MULTIDISCIPLINARY COURSE
MODEL QUESTION PAPER
BASIC ELECTRONICS

Time: 2 hours

Max marks: 50M

Section-A

Answer any Five of the following Questions

5X10=50 Marks

1. Explain Basics of House wiring.
2. What is the resultant resistance in Series combination of resistors?
3. Explain about earthing and its necessity.
4. What is the Symbol & applications of Photodiode.
5. What is the Symbol & applications of LED.
6. Explain about Electric geyser.
7. Briefly explain Modulation, Demodulation.
8. What are uses of Mobile phones?
9. Briefly discuss about a computer.
10. Discuss about GPS.

MULTIDISCIPLINARY COURSE

w.e.f. AY 2023-24

semester-III

BASIC ELECTRONICS QUESTION BANK

UNIT-I

11. What are the uses of digital multimeter.
12. Explain Basics of House wiring.
13. What is the resultant resistance in Series combination of resistors?
14. Explain about earthing and its necessity.
15. What are uses of Fuses, MCBs in electrical wiring.

UNIT-II

1. Explain the Classification of solids according to electrical conductivity.
2. What are Extrinsic semiconductors. Explain the fabrication of diode.
3. What is the Symbol & applications of Photodiode.
4. What is the Symbol & applications of LED.
5. Explain about Electric geyser.

UNIT-III

1. Discuss about Transmitter, Receiver, Channel in communication system.
2. Briefly explain Modulation, Demodulation.
3. What are uses of Mobile phones?
4. Briefly discuss about a computer.
5. Discuss about GPS.



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DEPARTMENT OF PHYSICS & ELECTRONICS

ACADEMIC YEAR 2024-25

List of Examiners and Paper Setters:

S.NO	Name of the Lecturer	Address
1	Sri.K. Ajay Kumar , Lecturer in Physics Mob:9493474612	GDC, Eluru,W.G.Dt
2	Sri M. Aruna , Lecturer in Physics, Mob.no-9490881096	GDC, Kanchikacherla, Krishna Dt
3	Smt.Ch. Komala Lakshmi, Lecturer in Physics, Mob.no-9440151266	GDC(A), Rajamahendravaram, E.G.Dt
4	Kum.G.Sirisha, Lecturer in Physics Mob.no-8121925246	GDC(W),Guntur, Guntur Dt.
5	Sri. Ch.VenkatswaraRao, Lecturer in Physics	GDC(A), Rajamahendravaram, E.G.Dt
6	Dr.P. Gopi Krishna, Asst. Prof. of ECM	K. L. Education Foundation, Vaddeswaram, Guntur.
7	Dr. K.Jayadev, Lecturer in Physics	PR GDC(A), Kakinada
8	Sri. Sk.Basha, Lecturer in Physics Mob no.9705964213	GDC, Rajamahendravaram, E.G.Dt



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DEPARTMENT OF PHYSICS & ELECTRONICS

ACADEMIC YEAR 2024-25

After thorough Discussion the following Resolutions are made:

1. It is resolved to follow the same syllabus prescribed by the APSCHE, Andhra Pradesh for UG students of B.Sc (Electronics) honors in all semesters with effect from the Academic Year 2024-25 admitted from the academic year 2023-24 under single major programme with some additional inputs and some deletions.
2. It Is resolved to Approve the syllabus of **Semester III and semester IV.**
3. It Is resolved to Approve the syllabus of Multi-Disciplinary Course “Basic Electronics” for the third Semester.
4. Resolved and approved the model question paper pattern for all semester examinations.
5. It is resolved to take 40%marks are eligible to treat as pass both in internal and external examinations.
6. It is resolved to take 60% of marks for external examinations and 40% for internal examinations as same as the BOS of last academic year 2023-24.
7. It is resolved for Multidisciplinary course that the semester end examination for maximum of 50 marks without internal assessment.
8. It is approved blueprint for theory and practical examinations.
9. It is resolved to consider 25 Marks for External evaluation and 25 marks for internal evaluation in Practical examination in all semesters from admitted batch 2024-25.
10. It is resolved to suggested student study projects, Extension activities, and Fieldtrips, curricular and co-curricular activities.

Signatures of the BOS members Attended:

1. Smt.P. Sailaja, In-Charge, Dept. Of Physics & Electronics :

(Board of studies chairperson) :

2. Prof. M. Rami Reddy, (University Nominee) :

Professor, Acharya Nagarjuna University, Nagarjuna Nagar

3. Dr.P. Gopi Krishna, Asst. Professor, Dept. of ECM (**Subject Expert**):

4. Sri N.Vara Prasad (**Industrialist**) :

5. T.Pujitha, M.Sc (**Alumni**) :

Members of the Department:

1. Dr. B.Nagamani, Lecturer in Physics :

2. Smt. T.V.Vakula Priya, Lecturer in Physics :

3. Dr.J. Nageswara Rao, Lecturer in Physics :

4. Dr. Asirvadam, Lecturer in Physics :

5. Sri.T. Devender Reddy, Lecturer in Physics :

6. Sri G.V. Gangadhara Rao, Lecturer in Physics :

Student members:

1. M. Narendra III B.sc (MECs) :

2. M.Chandra Sekhar III B.sc (MECs) :