



**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 2026-27**

**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 **30-06-2026** at 2.00 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	Dr.Ch.Srinivasa Rao, Professor, Andhra Loyola College (A), Vijayawada	University Nominee
3	Sri T.V.Rambabu, Lecturer in Physics SCIM GDC, Jangareddygudem, Eluru Dist. Mob:9490823654	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	Smt. T.V.Vakula Priya, Lecturer in Physics& Electronics Dr. J.Nageswara Rao , Lecturer in Physics& Electronics Dr. A. Asirvadam, Lecturer in Physics& Electronics Sri G.V.Gangadhara Rao, Lecturer in Physics& Electronics Smt. Sk.Jubeda, Lecturer in Physics& Electronics Smt.S.Kiranmayi, Lecturer in Physics& Electronics	Members of the Department
8	I. Harshitha Sri III B.Sc Electronics (Honours) I. Prudvi Raj II B.Sc Electronics (Honours)	Students



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DEPARTMENT OF PHYSICS & ELECTRONICS
ACADEMIC YEAR 2026-27**

Members of the Board of Studies of Department of Electronics met on 30 -06-2026 at 2.00 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 2026-27.
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 2026-27

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

w.e.f. AY 2025-26 Admitted Batches
COURSE STRUCTURE

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
I	I	1	Fundamental of Electricity and Electronics	3	3
			Fundamental of Electricity and Electronics Practical Course	2	1
		2	Circuit theory and Electronic Devices	3	3
			Circuit theory and Electronic Devices Practical Course	2	1
	II	3	Semiconductor Devices and Materials	3	3
			Semiconductor Devices and Materials Practical Course	2	1
		4	Digital Electronics	3	3
			Digital Electronics Practical Course	2	1
II	III	5	Analog Circuits and Communication	3	3
			Analog Circuits and Communication Practical Course	2	1
		6	Microprocessor System	3	3
			Microprocessor System Practical Course	2	1
		7	Electrical and Electronics Instrumentation	3	3
			Electrical and Electronics Instrumentation Practical Course	2	1
	IV	8	Electronic Communication System	3	3
			Electronic Communication System Practical Course	2	1
		9	Microcontroller and Interfacing	3	3
			Microcontroller and Interfacing Practical Course	2	1
		10	Computer Network	3	3

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
			Computer Network Practical Course	2	1
III	V	11	Cellular Mobile Communication	3	3
			Cellular Mobile Communication Practical Course	2	1
		12 A	Industrial Electronics	3	3
			Industrial Electronics Practical Course	2	1
		OR			
		12 B	Embedded System Design	3	3
			Embedded System Design Practical Course	2	1
		13 A	Digital System Design	3	3
			Digital System Design Practical Course	2	1
		OR			
		13 B	Consumer Electronics	3	3
			Consumer Electronics Practical Course	2	1
	VI	14 A	Power Electronics	3	3
			Power Electronics Practical Course	2	1
		OR			
		14 B	VLSI Design	3	3
			VLSI Design Practical Course	2	1
		15 A	Principles and Utility of Electronic Domestic Applications	3	3
			Principles and Utility of Electronic Domestic Applications Practical Course	2	1
		OR			
		15 B	Digital Signal Processing	3	3
			Digital Signal Processing Practical Course	2	1

Note: In the III Year (during the V and VI Semesters), students are required to select a pair of electives from one of the Two specified domains. For example: if set 'A' is chosen, courses 12 to 15 to be chosen as 12 A, 13 A, 14 A and 15 A or if set 'B' is chosen, It is to be chosen as 12 B, 13 B, 14 B and 15 B to ensure in-depth understanding and skill development in the chosen domain, students must continue with the same domain electives in both the V and VI Semesters.



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DEPARTMENT OF PHYSICS & ELECTRONICS
ACADEMIC YEAR 2026-27**

Course-5: ANALOG CIRCUITS AND COMMUNICATION

Theory	Credits:3	3hrs/week
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Course Outcomes (COs)

After successful completion of this course, the student will be able to:

CO1: Explain the characteristics, parameters, and operating principles of operational amplifiers and analyze various linear and nonlinear Op-Amp circuits such as inverting, non-inverting, summing, subtractor, integrator, differentiator, differential, logarithmic, and voltage-to-current converters.

CO2: Design and analyze Op-Amp-based applications including voltage regulators, comparators, instrumentation amplifiers, waveform generators, active filters, and describe the functional operation and applications of the IC 555 timer.

CO3: Analyze the principles of amplitude modulation (AM), derive mathematical relations for AM signals, calculate modulation parameters, and explain the generation and detection of AM waves.

CO4: Explain the theory of frequency modulation (FM), evaluate FM characteristics such as modulation index and bandwidth, and analyze the generation, detection, and advantages of FM communication systems.

CO5: Describe the principles of radio broadcasting and reception, explain the construction and operation of AM and FM transmitters and receivers, and compare different receiver architectures including straight receiver and superheterodyne receiver.

UNIT – I (9 HRS)

Part-A

OPERATIONAL AMPLIFIERS: Definition, Characteristics of Op-Amp, Block diagram of op-amp, inverting, noninverting, virtual ground, summing amplifier, subtractor, voltage follower

Part-B

Op-amp parameters, voltage to current converter, integrator, differentiator, differential amplifier, Logarithmic amplifier.

UNIT – II (9 HRS)

Part-A

OP-AMP CIRCUITS: voltage regulator, comparator (zero cross detecting circuit), instrumentation amplifier, sine wave generator (Wein bridge oscillator), square wave generator (Astable multi vibrator), triangular wave generator,

Part-B

Active filters (Basics)-low pass, high pass, band pass filters. IC-555 –functional block diagram and mention its applications

UNIT –III (9 HRS) AMPLITUDE MODULATION

Part-A

Need for modulation, amplitude modulation-analysis of an amplitude modulated wave, side bands and bandwidth, power relations in the AM wave.

Part-B

Generation of AM- Transistor modulators. Detection of AM signals – Diode detector.

UNIT - IV (9 HRS) FREQUENCY MODULATION

Part-A

Theory of FM, Frequency deviation and carrier swing, modulation index, deviation ratio, percent modulation. Mathematical representation of FM, frequency spectrum and bandwidth of FM waves,

Part-B

Generation of FM signals – Varactor diode modulator and Basic Reactance modulator. Detection of FM waves – FM demodulation– Ratio detector. Advantages of FM over AM.

UNIT - V (9 HRS) RADIO BROADCASTING AND RECEPTION:

Part-A

Spectrum of electromagnetic waves, Radio broadcasting and reception-Transmitter-AM Transmitter, FM Transmitter Radio receiver-

Part-B

AM receiver- Super heterodyne AM receiver. FM receiver- Super heterodyne FM receiver.

TEXT BOOKS:

1. Op Amp and Linear Integrated Circuits By Ramakant Gaykwad
2. Linear Integrated Circuits By Roy Choudhary
3. Unified Electronics Vol II – J.P. Agarwal and Amit Agarwal.
4. Electronic Communications - George Kennedy
5. Antennas and Wave Propagation – G.S.N. Raju – PHI
6. Principles of communication system –Herbert Taub & D.L. Schilling

Reference Books :

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

Course-5: ANALOG CIRCUITS AND COMMUNICATION

Practical

Credits:1

2hrs/week

Lab Experiments:

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

**Course-5: ANALOG CIRCUITS AND COMMUNICATION
MODEL QUESTION PAPER**

Time : 3 hrs

Max marks : 60

SECTION-A

Answer any Five of the following questions

5x 4M = 20M

1. Short answer type question from Unit-I
2. Short answer type question from Unit-I
3. Short answer type question from Unit-II
4. Short answer type question from Unit-II
5. Short answer type question from Unit-III
6. Short answer type question from Unit-III
7. Short answer type question from Unit-IV
8. Short answer type question from Unit-IV
9. Short answer type question from Unit-V
10. Short answer type question from Unit-V

SECTION-B

Answer All the following questions

5x8M = 40M

11. Essay type question from Unit-I

Or

12. Essay type question from Unit-I

13. Essay type question from Unit-II

Or

14. Essay type question from Unit-II

15. Essay type question from Unit-III

Or

16. Essay type question from Unit-III

17. Essay type question from Unit-IV

Or

18. Essay type question from Unit-IV

19. Essay type question from Unit-V

Or

20. Essay type question from Unit-V

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SEMESTER-3
COURSE 5: ANALOG CIRCUITS AND COMMUNICATION

Time:3 hours

Max marks: 60M

COURSE 5: BLUE PRINT

Unit		Essay Answer Questions	Short Answer Questions	Numerical Problem
I	A	1	1	1
	B	1		
II	A	1	2	-
	B	1		
III	A	1	1	1
	B	1		
IV	A	1	2	-
	B	1		
V	A	1	1	1
	B	1		

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SEMESTER-3
MODEL QUESTION PAPER
COURSE 5: ANALOG CIRCUITS AND COMMUNICATION

Time: 3 hours

Max marks: 60M

SECTION-A

Answer any Five of the following questions

5x 4M = 20M

1. Explain virtual ground in Op-amp.
2. Find the output voltage V_o of an Op-Amp inverting adder for the following sets of input voltages and resistors. In all cases $R_f = 1M\Omega$. $V_1 = -3V, V_2 = +3V, V_3 = +2V, R_1 = 250K\Omega, R_2 = 500K\Omega$ and $R_3 = 1M\Omega$.
3. Explain band pass filter.
4. Draw the block diagram of IC 555.
5. A modulated carrier wave has maximum and minimum amplitudes of 750mV and 250mV. Calculate the value of percentage modulation.
6. Explain for need for modulation.
7. What is FM? Explain frequency spectrum in FM?
8. In an FM Circuit, the modulation index is 10 and the highest modulation frequency is 20 kHz, what is the approximate bandwidth of the resultant FM signal.
9. Explain the spectrum of electromagnetic waves.
10. Describe the working of an AM transmitter with block diagram.

SECTION-B

Answer all the following questions.

5x8M = 40M

- 11) Discuss the Block diagram of Op-Amp and explain the characteristics of Op-Amp.
Or
- 12) Explain about integrator and differentiator Amplifier circuits in Op-Amps.
- 13) Explain the working principle of a sine wave generator using a Wien Bridge Oscillator.
Or
- 14) Explain the working of a high pass filter with neat circuit diagram and sketch its frequency response.
- 15) Describe side bands and band width and derive expression for power in AM.
Or
- 16) What is Amplitude Modulation? How can you generate AM wave by using transistor modulator circuit?
- 17) What is FM? How can you generate FM wave by using varactor diode modulator?
Or
- 18) What is demodulation, how can you detect FM wave by using ratio detector?
- 19) Draw the block diagram of FM transmitter and explain its each block.
Or
- 20) Draw the block diagram of Super heterodyne AM receiver and explain its each block.

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QUESTION BANK
COURSE 5: ANALOG CIRCUITS AND COMMUNICATION

UNIT -I

Short Answer Questions

1. Explain virtual ground in Op-amp.
2. Explain about Op-amp parameters.
3. Explain about voltage to current converter in Op-amp.
4. Find the output voltage V_o of an Op-Amp inverting adder for the following sets of input voltages and resistors. In all cases $R_f = 1M\Omega$. $V_1 = -3V, V_2 = +3V, V_3 = +2V, R_1 = 250K\Omega, R_2 = 500K\Omega$ and $R_3 = 1M\Omega$.
5. Find the output voltage V_o of an Op-Amp inverting amplifier if input voltage $V_i = 0.5V, R_i = 5K\Omega$ and $R_f = 100K\Omega$.

Long Answer Questions

1. Discuss the Block diagram of Op-Amp and explain the characteristics of Op-Amp.
2. Explain about integrator and differentiator Amplifier circuits in Op-Amps.
3. Explain about Summing, Subtractor and Voltage Amplifier circuits in Op-Amps.

UNIT-II

Short Answer Questions

1. Explain comparator circuit
2. Explain voltage regulator circuit.
3. Draw the block diagram of IC 555.
4. Explain band pass filter.
5. Explain instrumentation amplifier.
6. Explain triangular wave oscillator with neat circuit diagram.

Long Answer Questions

1. Explain the working principle of a sine wave generator using a Wien Bridge Oscillator.
2. Explain the operation of an astable multivibrator to generate square wave form.
3. Explain the working of a low pass filter with neat circuit diagram and sketch its frequency response.
4. Explain the working of a high pass filter with neat circuit diagram and sketch its frequency response.

UNIT-III

Short Answer Questions

1. Explain for need for modulation.
2. Explain frequency spectrum of AM.
3. Explain diode detector for AM signals.
4. A modulated carrier wave has maximum and minimum amplitudes of 750mV and 250mV. Calculate the value of percentage modulation.

Long Answer Questions

1. Describe side bands and band width and derive expression for power in AM.
2. What is amplitude modulation. Explain analysis of AM wave.
3. What is Amplitude Modulation? How can you generate AM wave by using transistor modulator circuit?

UNIT-IV

Short Answer Questions

1. Define Frequency deviation, carrier swing, modulation index and deviation ratio.
2. What is FM? Explain frequency spectrum in FM?
3. Explain the Mathematical representation of FM wave?
4. In an FM Circuit, the modulation index is 10 and the highest modulation frequency is 20 kHz, what is the approximate bandwidth of the resultant FM signal.

Long Answer Questions

1. What is FM? How can you generate FM wave by using varactor diode modulator?
2. What is FM? How can you generate FM wave by using reactance modulator?
3. What is demodulation, how can you detect FM wave by using ratio detector?

UNIT-V

Short Answer Questions

1. Explain the spectrum of electromagnetic waves.
2. Explain importance of Radio broadcasting and reception in communication?
3. Describe the working of an AM transmitter with block diagram.

Long Answer Questions

1. Draw the block diagram of FM transmitter and explain its each block.
2. Draw the block diagram of Super heterodyne AM receiver and explain its each block.
3. Draw the block diagram of Super heterodyne FM receiver and explain its each block.



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ACADEMIC YEAR 2026-27**

**SEMESTER - III
COURSE 6: MICROPROCESSOR SYSTEMS**

Theory	Credits: 3	3 hrs/week
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Course Outcomes (COs)

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

CO1: Explain the architecture, organization, pin configuration, addressing modes, and instruction execution of 8085 and 8086 microprocessors.

CO2: Classify and apply the 8085 instruction set to perform data transfer, arithmetic, logical, branching, and machine control operations.

CO3: Develop, execute, and debug 8085 assembly language programs to perform arithmetic operations, data conversion, and array-processing applications.

CO4: Analyze the operation of 8086 system configurations, interrupt management, and programmable peripheral devices including 8251, 8253, 8255, 8279, and 8237 for interfacing applications.

CO5: Explain the architecture, organization, programming model, and instruction set of ARM processors and illustrate their applications in modern embedded systems.

UNIT -I: (9 Hours)

Part-A

CPU ARCHITECTURE: Introduction to Microprocessor, INTEL – 8085 μ P architecture, ALU Unit, Register organization (general purpose & Special purpose registers), Address, data and control Buses.

Part-B

Pin configuration of 8085. 8086 Microprocessor: Architecture, Pin description. Instruction format, Addressing modes.

UNIT -II: (9 Hours)

Part-A

8085 Instruction Set: Data transfer Instruction, Logical Instructions,

Part-B

Arithmetic Instructions, Branch Instructions, Machine Control instructions.

UNIT -III: (9 Hours)

Part-A

Assembly Language Programming using 8085: Programmes for Addition (Two 8 &16 Bits), Subtraction (Two 8&16 Bits), Multiplication (Two 8 &16 Bits),

Part-B

Programmes for Division (Two 8&16 Bits), largest and smallest number in an array. BCD to ASCII and ASCII to BCD.

UNIT -IV: (9 Hours)

Part-A

Basic 8086 Configurations – Minimum mode and Maximum Mode, Interrupt Priority Management I/O Interfaces: Serial Communication interfaces (8251), Programmable peripheral interface 8255,

Part-B

Programmable Timers (8253), Keyboard and display (8279), DMA controller (8237).

UNIT -V: (9 Hours)

Part-A

ARM PROCESSOR: Introduction to 16/32 bit processors, Arm architecture & organization,

Part-B

Arm based MCUs, Programming model, Instruction set.

TEXTBOOKS:

1. Microprocessor Architecture, Programming and Applications with the 8085 – Penram International
2. Publishing, Mumbai.- Ramesh S. Gaonkar
3. Microcomputer Systems the 8086/8088 family – YU-Cheng Liu and Glenn SA Gibson
4. Microcontrollers Architecture Programming, Interfacing and System Design – Raj Kamal
5. 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.

SEMESTER - III
COURSE 6: MICROPROCESSOR SYSTEMS

Practical
hrs/week

Credits: 1

2

Course Objectives:

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 8085 microprocessor.
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

List of Experiments: Any six of the following Experiments

Programs using Intel 8085

1. Write an assembly language program for Addition of two 8 bits
2. Write an assembly language program for Subtraction of two 8 bits
3. Write an assembly language program for Multiplication of two 8 bits
4. Write an assembly language program for Division of two 8 bits
5. Write an assembly language program for Largest number in an array.
6. Write an assembly language program for Smallest number in an array.
7. Write an assembly language program for BCD to ASCII.
8. Write an assembly language program for ASCII to BCD
9. Write an assembly language program to Convert Two BCD Numbers in to Hexa decimal
10. Write an assembly language Program to Convert Hex Number in to BCD Number.
11. Write an assembly language Program to find the Square Root of a Given Number.
12. Interfacing Experiments Using 8086 Microprocessor (Demo):
13. Traffic Light Controller, Elevator, 7-Segment Display

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SEMESTER-3
COURSE 6: MICROPROCESSOR SYSTEMS

Time:3 hours

Max marks: 60M

COURSE 6: BLUE PRINT

Unit	Essay answer questions	Short answer questions	Numerical problems
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

Note: One essay question from Part-A and One essay question from Part-B in each unit.

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SEMESTER-3

MODEL QUESTION PAPER

COURSE 6: MICROPROCESSOR SYSTEMS

Time:3 hours

Max marks: 60M

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 8-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?

COURSE 6: 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:

1. Explain flag registers in 8085 microprocessor?
2. Explain different registers available in 8085 microprocessor?
3. Draw the pin diagram of 8085 and mention the pin names?
4. Explain general purpose registers in 8085?
5. 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 8-bit numbers.
2. Write an ALP for subtraction of two 8-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?

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ACADEMIC YEAR 2026-27**

SEMESTER-III

COURSE 7: ELECTRICAL AND ELECTRONIC INSTRUMENTATION

Theory	Credits: 3	3 hrs/week
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Course Outcomes (COs)

After successful completion of this course, the student will be able to:

CO1: Explain the principles, construction, characteristics, and applications of DC and AC indicating instruments, and evaluate measurement errors and instrument performance.

CO2: Analyze the operation of DC and AC bridges and apply bridge balancing principles to measure electrical parameters such as resistance, capacitance, inductance, and frequency.

CO3: Explain the working principle and applications of cathode-ray oscilloscopes (CRO), sampling oscilloscopes, and digital storage oscilloscopes for electrical signal analysis and measurement.

CO4: Analyze the operation and applications of instrumentation amplifiers, electronic measuring instruments, function generators, wave analyzers, and spectrum analyzers in electronic instrumentation.

CO5: Explain the operating principles and applications of various transducers and display devices used in measurement and instrumentation systems.

UNIT-I (9 Hrs)

Part-A

DC and AC indicating Instruments: Accuracy and precision - Types of errors - PMMC galvanometer, sensitivity, Loading effect - Conversion of Galvanometer into ammeter.

Part-B

Voltmeter and Shunt type ohmmeter- Multimeter. Electrodynamicometer - Thermocouple instrument - Electrostatic voltmeter - Watt- hour meter.

UNIT-II (9 Hrs)

Part-A

DC and AC bridges: Hey's bridge -Wheatstone bridge - Kelvin's bridge

Part-B

Balancing condition for AC bridge- Maxwell's bridge -Schering's bridge - Wein's bridge - Determination of frequency.

UNIT-III (9 Hrs)**Part-A**

Oscilloscopes: Block diagram - Deflection Sensitivity - Electrostatic Deflection - Electrostatic Focusing - CRT Screen –

Part-B

Measurement of Waveform frequency, phase difference and Time intervals using CRO - Sampling Oscilloscope - Analog and Digital Storage Oscilloscopes.

UNIT-IV (9 Hrs)**Part-A**

Instrumentation Amplifiers and Signal Analysers: Instrumentation amplifier - Electronic Voltmeter and Multimeter - Digital Voltmeter –

Part-B

Function Generator - Wave Analyser - Fundamentals of Spectrum Analyser.

UNIT-V (9 Hrs)**Part-A**

Transducer and Display Devices: Strain Gauge - Unbounded Strain Gauge - LVDT - Resistance Thermometer –

Part-B

Photoelectric Transducer - Pen Recorder - Audio Tape Recorder - Seven Segment Display - LCD.

Text Books

1. Electronic Instrumentation and Measurement Techniques - W.D. Cooper & 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-III

COURSE 7: ELECTRICAL AND ELECTRONIC INSTRUMENTATION

Theory

Credits: 1

2 hrs/week

PRACTICAL SYLLABUS:

1. Familiarization of digital multimeter and its usage in the measurements of (i) resistance (ii) current, (iii) AC & DC voltages
2. Measure the AC and DC voltages, frequency using a CRO and compare the values measured with other instruments like Digital multimeter.
3. Formation of sine square wave signals on the CRO using Function generator and measure their frequencies. Compare the measured values with actual values
4. Display the numbers from 0 to 9 on a single Seven Segment Display module by applying voltages.
5. A.C - Impedance and Power Factor.
6. Maxwell's Bridge – Determination of Inductance.
7. Display the letters **a** to **h** on a single Seven Segment Display module by applying voltages.

SEMESTER-III
COURSE 7: ELECTRICAL AND ELECTRONIC INSTRUMENTATION
Theory Credits: 4 5 hrs/week

COURSE 7: 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

Note: One essay question from Part-A and One essay question from Part-B in each unit.

SEMSESTER-III
MODEL QUESTION PAPER
COURSE 7: 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-III
COURSE7: 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 Kelvin's 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 2026-27**

SEMESTER-IV

COURSE 8: ELECTRONIC COMMUNICATION SYSTEM

Theory Credits:3 3 Hours/Week

Course Outcomes (COs)

After successful completion of this course, the student will be able to:

CO1: Explain the principles, characteristics, and performance parameters of antennas and analyze different antenna systems and electromagnetic wave propagation mechanisms used in communication.

CO2: Analyze pulse modulation techniques, sampling theorem, quantization, encoding, and decoding processes used in digital communication systems.

CO3: Explain multiplexing and digital modulation techniques, compare modern communication technologies, and analyze the basic operation of RADAR systems.

CO4: Analyze the principles, components, transmission characteristics, and applications of fiber optic communication systems.

CO5: Explain the architecture, operation, orbital concepts, and applications of satellite communication systems, including VSAT, GPS, and Direct Broadcast Satellite (DBS) systems.

UNIT-I (9 Hrs)

Part-A

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

Part-B

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

UNIT-II (9 Hrs)

Part-A

Pulse Modulation - Sampling theorem - PWM

Part-B

PCM - quantization, sampling Encoding and decoding, quantization error, delta modulation and adaptive delta modulation.

UNIT-III (9 Hrs)

Part-A

Multiplexing - FDM, TDM, CDMA - ASK, FSK, PSK –Advantages of Digital Communication –

Part-B

Introduction to Microwave Communications, - RADAR - range equation.

UNIT-IV (9 Hrs)

Part-A

Fiber Optic Communication - Introduction - Principle of optical fiber communication - Structure of optical fiber - Types of optical fibers - Acceptance angle and Numerical Aperture - Step index and graded index fibers - Losses in optical fibers –

Part-B

Optical sources: LED and LASER - Optical detectors: PIN diode and Avalanche photodiode - Advantages and applications of fiber optic communication.

UNIT-V (9 Hrs)

Part-A

Satellite Communication - Introduction - Need for satellite communication - Types of satellites - Geostationary satellite - Satellite transponder - Uplink and downlink systems –

Part-B

Satellite communication block diagram - Orbital concepts - Applications of satellite communication - VSAT - GPS - Direct Broadcast Satellite (DBS) systems.

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.
3. John M. Senior, "Optical Fiber Communications", Pearson Education.
4. Dennis Roddy, "Satellite Communications", McGraw Hill.

Reference Books

1. Communication System - Roddy & Coolen, 4/e, Pearson Education, 2005.
2. Principles of Communication Engineering - Anok Singh, 4/e, Sathya prakasam Publications, 2004.
3. Electronic Communication Systems Wayne Tomasi, 4/e, Pearson Education, 2004.
4. Govind P. Agrawal, "Fiber Optic Communication Systems", Wiley.
5. Bruce R. Elbert, "Introduction to Satellite Communication", Artech House.

SEMESTER-IV

COURSE 8: ELECTRONIC COMMUNICATION SYSTEM

Practicals

Credits:1

2 Hours/Week

ANY SIX EXPERIMENTS SHOULD BE DONE

Students can do the Practicals from available resources

1. Generation and observation of PAM signals.
2. Generation and observation of PWM signals.
3. Generation and observation of PPM signals.
4. Generation and detection of ASK signals.
5. Generation and detection of FSK signals.
6. Generation and detection of PSK signals.
7. Study of Time Division Multiplexing (TDM).
8. Study of Frequency Division Multiplexing (FDM).
9. Demonstration experiment on Satellite communication link.
10. Study of RADAR block diagram and range calculation.

SEMESTER-IV

COURSE 8: ELECTRONIC COMMUNICATION SYSTEM

Theory

Credits:4

5hrs/week

COURSE 8: 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

Note: One essay question from Part-A and One essay question from Part-B in each unit.

SEMESTER-IV
MODEL QUESTION PAPER
COURSE 8: ELECTRONIC COMMUNICATION SYSTEM

Time:3 hours

Max marks: 60M

SECTION-A

Answer any FIVE of the following.

5X4=20M

1. Explain Antenna parameters
2. Explain Skip distance
3. State and explain the Sampling Theorem.
4. Write short notes on Adaptive Delta Modulation.
5. What is Multiplexing? What are the advantages of multiplexing.
6. Explain CDMA
7. Define Numerical Aperture and Acceptance angle.
8. State the applications of optical fiber communication.
9. Define uplink and downlink frequencies.
10. Explain the need for satellite communication.

SECTION-B

Answer all the questions

5X8=40M

11. Explain about Yagi Uda Antenna.

OR

12. Explain Space wave propagation .

13. Explain pulse amplitude modulation and explain their advantages and disadvantages.

OR

14. Describe the working principle of Pulse Code Modulation (PCM) with block diagram for encoding and decoding.

15. Explain Frequency Division Multiplexing (FDM), Time Division Multiplexing (TDM), with neat diagrams.

OR

16. Explain ASK, FSK, and PSK digital modulation techniques and compare their performance.

17. Discuss the construction and working of step index and graded index optical fibers.

OR

18. Explain the principle and structure of optical fiber communication system with a neat diagram.

19. Explain the basic block diagram of a satellite communication system and describe the function of each block.

OR

20. Explain geostationary satellites and discuss their advantages and limitations.

COURSE 8: ELECTRONIC COMMUNICATION SYSTEM

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

SHORT ANSWER QUESTIONS

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

UNIT- II

ESSAY QUESTIONS

1. Explain pulse amplitude modulation and explain their advantages and disadvantages.
2. Explain pulse width modulation
3. Describe the working principle of Pulse Code Modulation (PCM) with block diagram for encoding and decoding.

SHORT ANSWER QUESTIONS

1. State and explain the Sampling Theorem.
2. Differentiate between PAM and PWM.
3. What is quantization error in PCM?
4. Explain the process of PPM.
5. Write short notes on Adaptive Delta Modulation.

UNIT- III

ESSAY QUESTIONS

1. Explain Frequency Division Multiplexing (FDM), Time Division Multiplexing (TDM), with neat diagrams.
2. Explain ASK, FSK, and PSK digital modulation techniques and compare their performance.
3. Explain the basic principle of RADAR and derive the RADAR range equation.

SHORT ANSWER QUESTIONS

1. What is Multiplexing? What are the advantages of multiplexing.
2. List the advantages of Digital Communication.
3. Write short notes on Fiber Optic Communication.
4. Explain CDMA

UNIT- IV

ESSAY QUESTIONS

1. Explain the principle and structure of optical fiber communication system with a neat diagram.
2. Discuss the construction and working of step index and graded index optical fibers.
3. Compare single mode and multimode optical fibers with suitable diagrams.
4. Discuss various losses in optical fibers and explain methods to minimize them.
5. Explain the working principles of PIN photodiode and Avalanche photodiode, used in optical communication.

SHORT ANSWER QUESTIONS

1. Define Numerical Aperture and Acceptance angle.
2. List the advantages of optical fiber communication.
3. Write short notes on LED and LASER sources.
4. Explain the Types of optical fibers
5. State the applications of optical fiber communication.

UNIT- V

ESSAY QUESTIONS

1. Explain the basic block diagram of a satellite communication system and describe the function of each block.
2. Describe the working of a satellite transponder with neat diagram.
3. Explain geostationary satellites and discuss their advantages and limitations.

4. Explain orbital concepts and their importance in satellite communication systems.
5. Discuss the applications of satellite communication in modern communication systems such as GPS, VSAT

SHORT ANSWER QUESTIONS

1. Define uplink and downlink frequencies.
2. List different types of satellites.
3. Write short notes on DBS Systems.
4. State the applications of satellite communication.
5. Explain the need for satellite communication.



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DEPARTMENT OF PHYSICS & ELECTRONICS
ACADEMIC YEAR 2026-27**

Course: 9:: MICROCONTROLLER AND INTERFACING

Theory

Credits:3

3hrs/week

Course Outcomes (COs)

After successful completion of this course, the student will be able to:

CO1: Explain the evolution, architecture, memory organization, and functional features of the 8051 microcontroller, and distinguish between microprocessors and microcontrollers.

CO2: Describe the internal organization of the 8051 microcontroller, including ports, memory, register banks, timers, interrupts, stack, and program counter, and explain their functions in embedded systems.

CO3: Apply the 8051 instruction set and various addressing modes to develop programs for arithmetic, logical, data transfer, branching, timing, and control applications.

CO4: Develop, test, and debug 8051 assembly language programs to perform arithmetic operations, sorting, delay generation, and timer/counter-based applications.

CO5: Design and implement 8051-based interfacing applications using peripheral devices such as PPI 8255, DAC, LM35 temperature sensor, seven-segment display, LCD, and stepper motor.

UNIT-I: (9 Hrs)

Part-A

Introduction, comparison of Microprocessor and microcontroller, Evolution of microcontrollers from 4-bit to 32-bit, Development tools for micro controllers- Assembler- Compiler, Simulator, Debugger.

Part-B

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

UNIT -II: (9 Hrs)

Part-A

Pin diagram of 8051, Port organization. Memory organization- Program memory and Data memory. Register banks,

Part-B

Data types and directives, Interrupts. Stack pointer and program counter

UNIT-III:(9 Hrs)**Part-A**

Addressing modes, instruction set of 8051: Addressing modes and accessing memory using various addressing modes,

Part-B

Instruction set: Arithmetic, Logical, data transfer, bit oriented and branch instructions. and their usage.

Unit -IV: (9 Hrs)**Part-A**

Assemble language programming Examples: Addition, Multiplication, Subtraction, division, arranging a given set of numbers in ascending and descending order.

Part-B

Time delay generation and calculation Timer/Counter Programming-Mode 0, Mode-1 and Mode-2.

UNIT-V : (9 Hrs)**Part-A**

Interfacing and Application of Microcontroller: Interfacing of – PPI 8255, DAC (0804), Temperature measurement (LM35).

Part-B

Interfacing seven segment displays, displaying information on a LCD, control of a stepper Motor (Uni-Polar).

TEXT BOOKS:

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

REFERENCE BOOKS:

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

Course: 9 MICROCONTROLLER AND INTERFACING

Practical

Credits: 1

2 hrs/week

COURSE 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

LIST OF EXPERIMENTS:

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. Arranging a given set of numbers in ascending/descending order.
6. Addition of Two 8-Bit Numbers (Keil Software).
7. Addition of Two 16-Bt Numbers (Keil Software)
8. Subtraction of Two 8-Bit Numbers (Keil Software).
9. Subtraction of Two 16-Bit Numbers (Keil Software).
10. 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).
- Interfacing Seven Segments to 8051 Microcontroller (Keil Software).

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B.Sc (ELECTRONICS) Honours
SEMESTER-4
Course: 9:: MICROCONTROLLER AND INTERFACING

Time:3 hours

Max marks: 60M

COURSE 9: BLUE PRINT

Unit	Essay answer questions	Short answer questions	Numerical problems
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

Note: One essay question from Part-A and One essay question from Part-B in each unit.

SRR & CVR GOVT.DEGREE COLLEGE (A), VIJAYAWADA

SEMESTER-1V,

COURSE:9 MICROCONTROLLER AND INTERFACING

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 organisation of 8051 microcontroller.
2. Draw the pin diagram of 8051 microcontroller and explain each pin.
3. Explain data types 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 arrange the set of given numbers in descending order
2. Write an ALP to arrange the set of given numbers in ascending order
3. Explain MODE 0 programming in 8051 microcontrollers.
4. Explain MODE 1 programming in 8051 microcontrollers.
5. 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.
5. Explain time delay generation and calculation using 8051 timer.

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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AFFILIATED TO KRISHNA UNIVERSITY, MACHILIPATNAM

DEPARTMENT OF PHYSICS & ELECTRONICS

ACADEMIC YEAR 2026-27

**SEMESTER – IV
COURSE 10: COMPUTER NETWORK**

Theory	Credits: 3	3 hrs/week
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Course Outcomes (COs)

After successful completion of this course, the student will be able to:

CO1: Explain the fundamentals of computer networks, network topologies, switching techniques, and the functions of the OSI seven-layer reference model.

CO2: Analyze the physical layer concepts, transmission media, channel allocation methods, and IEEE LAN protocols used in data communication networks.

CO3: Apply data link layer protocols for framing, error detection, error correction, and flow control to ensure reliable data transmission.

CO4: Explain the functions of the network, transport, and session layers, and analyze routing algorithms, congestion control techniques, and internetworking devices.

CO5: Describe the functions of the presentation and application layers, and evaluate high-speed networking technologies and communication standards used in modern computer networks.

UNIT -I: (9 Hours)

Part-A

Network structure Point to Point, Broadcast, Multicast - Horizontal and vertical distribution - Star, Mesh, tree, bus structures –

Part-B

OSI 7 layer model - Architecture - Functions of layers - Packet switches, circuit switching and message switching.

UNIT -II: (9 Hours)

Part-A

Physical layer - Transmission media - Channel allocation methods - ALOHA, S- ALOHA.

Part-B

LAN Protocols IEEE802.3, 802.4, 802.5, 802.6 and 802.11.

UNIT -III: (9 Hours)

Part-A

Data link layer - Framing - Error detection - Error correction - CRC

Part-B

Stop and wait - Go band N - Sliding window Protocol - Selective repeat.

UNIT -IV: (9 Hours)

Part-A

Network layer - Routing algorithms and congestion control algorithms - Repeaters, Bridges, Routers and Gateways.

Part-B

Inter networking - Introduction to transport layer and session layer.

UNIT -V: (9 Hours)

Part-A

Presentation layer - coding, compression and cryptography - Introduction to Application layer

Part-B

High performance networks - ATM, Fast Ethernet, FDDI, SONET and SDH.

Text Books

1. Computer Networks - Andrew S. Tanenbaum, 4/e, Pearson Education, 2005.
2. Data and Computer Communication - W. Stallings, 7/e, Pearson Education, 2006.

Reference Books

1. Introduction to Data Communications and Networking - Behrouz & Forouzan, 4/e, McGraw Hill Book Company, 2004.
2. Telecommunication Networks - Protocols Modeling and Analysis - Misha Stewartz, 2/e, Pearson Ed

SEMESTER – IV
COURSE 10: COMPUTER NETWORK

<u>Practical</u>	<u>Credits: 1</u>	<u>2 hrs/week</u>
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At least any six of the following experiments

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 commands.
6. Performing an Initial Switch Configuration
7. Performing an Initial Router Configuration
8. Configuring and Troubleshooting a Switched Network
9. Packet, Circuit and Message switching simulation using Packet Tracer
10. Configuring WEP on a Wireless Router

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B.Sc (ELECTRONICS) Honours
SEMESTER-4
COURSE 10: COMPUTER NETWORK

Time:3 hours

Max marks: 60M

COURSE 10: BLUE PRINT

Unit	Essay answer questions	Short answer questions	Numerical problems
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

Note: One essay question from Part-A and One essay question from Part-B in each unit.

S.R.R & C.V.R. GOVERNMENT DEGREE COLLEGE (A) VIJAYAWADA

B.Sc (ELECTRONICS) Honours

SEMESTER-4

MODEL QUESTION PAPER

COURSE 10: COMPUTER NETWORK

Time:3 hours

Max marks: 60M

SECTION-A

Answer any Five of the following questions

5x 4M = 20M

1. Short answer type question from Unit-I
2. Short answer type question from Unit-I
3. Short answer type question from Unit-II
4. Short answer type question from Unit-II
5. Short answer type question from Unit-III
6. Short answer type question from Unit-III
7. Short answer type question from Unit-IV
8. Short answer type question from Unit-IV
9. Short answer type question from Unit-V
10. Short answer type question from Unit-V

SECTION-B

Answer all the following questions.

5x8M = 40M

11 Essay type question from Unit-I

Or

12) Essay type question from Unit-I

13) Essay type question from Unit-II

Or

14) Essay type question from Unit-II

15) Essay type question from Unit-III

Or

16) Essay type question from Unit-III

17) Essay type question from Unit-IV

Or

18) Essay type question from Unit-IV

19) Essay type question from Unit-V

Or

20) Essay type question from Unit-V

S.R.R & C.V.R. GOVERNMENT DEGREE COLLEGE (A) VIJAYAWADA
B.Sc (ELECTRONICS) Honours
SEMESTER-4
MODEL QUESTION PAPER
COURSE 10: COMPUTER NETWORK

Time: 3 hours

Max marks: 60M

SECTION-A

Answer any five of the following

5X4=20M

1. Explain Mesh structure in computer networks.
2. Explain Tree structure in computer networks.
3. Explain IEEE 802.11 architecture.
4. Explain Token ring format (IEEE 802.5).
5. Explain about framing in data link layer.
6. Explain Selective repeat ARQ.
7. Explain about bridge.
8. Explain the introduction to transport layer.
9. Explain the functions of application layer.
10. Write a short note on SDH.

SECTION-B

Answer ALL the following

5X8=40M

11. Draw the architecture of OSI 7-layer method and explain the functions of layers.

Or

12. Explain the different types of switching techniques in computer networks.
13. Explain the channel allocation methods ALOHA and Slotted ALOHA.

Or

14. Explain IEEE 802.6 (DQDB) standard.
15. Explain error correction Hamming code.

Or

16. Explain Go back N protocol.
17. Explain the routing algorithms in network layer.

Or

18. Explain token bucket algorithm.
19. Explain briefly about SONET.

Or

20. Explain the asynchronous transfer mode (ATM) in computer network.

SRR & CVR GOVT.DEGREE COLLEGE(A), VIJAYAWADA
SUBJECT: ELECTRONICS MAJOR- SEMESTER-IV
COURSE 10: COMPUTER NETWORK
QUESTION BANK

UNIT-I

Long answer questions.

1. Explain the different types of network structures.
2. Draw the architecture of OSI 7 layer method and explain the functions of layers.
3. Explain the different types of switching techniques in computer networks.

UNIT-I

Short answer questions

1. Explain Star structure in computer networks.
2. Explain Mesh structure in computer networks.
3. Explain Tree structure in computer networks.
4. Explain Bus structure in computer networks.

UNIT-II

Long answer questions.

1. Explain the types of transmission media in computer networks.
2. Explain the channel allocation methods ALOHA and Slotted ALOHA.
3. Explain IEEE 802.6 (DQDB) standard.
4. Explain Token Bus (IEEE 802.4) standard.

UNIT-II

Short answer questions

1. Explain Ethernet frame format IEEE 802.3.
2. Explain IEEE 802.11 architecture.
3. Explain Token ring format (IEEE 802.5).

UNIT-III

Long answer questions.

1. Explain error detection code Cyclic Redundancy Check.
2. Explain error correction Hamming code.
3. Explain stop and wait protocol.
4. Explain Go back N protocol.

UNIT-III

Short answer questions.

1. Explain about framing in data link layer.
2. Explain Selective repeat ARQ.

UNIT-IV

Long answer questions.

1. Explain the routing algorithms in network layer.
2. Explain leaky bucket algorithm.
3. Explain token bucket algorithm.

UNIT-IV

Short answer questions.

1. Explain router.
2. Explain about bridge.
3. Explain about repeater.
4. Explain about Gateway.
5. Explain internetworking.
6. Explain the introduction to transport layer.
7. Explain the introduction to session layer.

UNIT-V

Long answer questions.

1. Explain the functions of presentation layer.
2. Explain briefly about SONET.
3. Explain the asynchronous transfer mode (ATM) in computer network.
4. Explain in detail about the fast ethernet.

UNIT-V

Short answer questions.

1. Explain the functions of application layer.
2. Write a short note on SDH.
3. Explain FDDI.



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

ADMITTED BATCHES FROM THE ACADEMIC YEAR 2025-26

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 2026-27 admitted from the academic year 2025-26 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. Resolved and approved the model question paper pattern for all semester examinations.
4. It is resolved to take 40%marks are eligible to treat as pass both in internal and external examinations.
- 5.It is resolved to take 60% of marks for external examinations and 40% for internal examinations.
6. It is approved blueprint for theory and practical examinations.
7. It is resolved to consider 25 Marks for External evaluation and 25 marks for internal evaluation in Practical examination in all semesters from admitted batches 2025-26.
8. It is resolved to suggested student study projects, Extension activities, and Fieldtrips, curricular and co-curricular activities.