

**GOVERNMENT COLLEGE FOR MEN (A), KADAPA**  
**Department of Electronics**

**Structure of B.Sc Electronics for III Year under CBCS**

Skill Enhancement Courses (SECs) for Semester V, from 2022-23  
(Syllabus-Curriculum)

Structure of SECs for Semester – V

*(To Choose One pair from the Three alternate pairs of SECs)*

Courses 6 & 7	Name of the Course	Theory Hrs/Week	IE Marks	EE Marks	Credits	Practical Hrs/week	Marks	Credits
6A	Industrial Electronics	3	40	60	3	3	50	2
7A	Electronic Instrumentation	3	40	60	3	3	50	2

**OR**

Courses 6 & 7	Name of the Course	Theory Hrs/Week	IE Marks	EE Marks	Credits	Practical Hrs/week	Marks	Credits
6B	Embedded systems design	3	40	60	3	3	50	2
7B	Consumer Electronics	3	40	60	3	3	50	2

**OR**

Courses 6 & 7	Name of the Course	Theory Hrs/Week	IE Marks	EE Marks	Credits	Practical Hrs/week	Marks	Credits
6C	VLSI Design	3	40	60	3	3	50	2
7C	Data Communication and Networking	3	40	60	3	3	50	2

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

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

**GOVT. COLLEGE FOR MEN (AUTONOMOUS), KADAPA**  
Semester-wise Revised Syllabus under CBCS, 2022-23  
Three Year B.Sc.  
Domain Subject: **ELECTRONICS**  
III Year B.Sc., - Semester – V

**Course 6A: Industrial Electronics**

(Skill Enhancement Course (Elective), 3+2 Credits)  
Max. Marks: Theory:100 + Practical:50

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**UNIT-I (20 hours)**

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

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

**UNIT-II (10 hours)**

**Power Supplies:** Block diagram of regulated power supply – A simple regulated transistorized power supply (circuit and working) – Principle and working of switch mode power supply (SMPS).

**UNIT-III(10 hours)**

**Voltage Multipliers:** Half wave voltage doubler, Full wave voltage doubler, Voltage Tripler circuit diagram and working mentioning of applications of voltage multipliers.

**UNIT-IV (10 hours)**

**Controlled rectifiers:** SCR Half wave rectifier circuit, working with wave forms, mathematical analysis for resistive load. - SCR Full wave rectifier circuit, working with wave forms, mathematical analysis for resistive load – SCR as inverter parallel and series circuits.

**UNIT-V(10 hours)**

**Heating:** Different methods of Industrial Heating and Welding. Advantages of Electrical Heating over other methods of Heating. Resistance, inductance and dielectric heating - Principle, operation and mentioning their applications.

**Reference Books:**

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

**Model Question Paper**

**Q.P.Code No: 6305-A**

**GOVT. COLLEGE FOR MEN (AUTONOMOUS), KADAPA  
B.Sc Second Year Degree III Semester Examination  
Part II - Electronics**

**PAPER-VI(A): Industrial Electronics**

(w.e.f 2022-23)

Time: 3 hours

Max. Marks: 60

**PART - A**

**Answer any FIVE questions. Each question carries 4 marks. – (5 X 4 = 20 Marks)**

1. Explain the working of Bridge type Full Wave Rectifier with a circuit.
2. Explain the operation of  $\pi$ -section Filter.
3. Explain the working transistor shunt voltage regulator.
4. Draw the block diagram of regulated power supply. Explain each block.
5. Explain the working of Half wave voltage doubler.
6. Write the applications of voltage multipliers.
7. Explain the working of SCR Parallel inverter with a circuit.
8. What are the advantages of Electrical Heating over other methods of Heating.

**PART - B**

**Answer any FIVE questions. Each question carries 8 marks. – (5 X 8 = 40 Marks)**

9. With a neat circuit diagram explain the working of a full wave rectifier and derive the expressions for efficiency and ripple factor.
10. Explain the working of shunt capacitance and L-section filters.
11. Explain three terminal fixed voltage regulators (78XX and 79XX).
12. Explain the principle and working of Switch Mode Power Supply.
13. Explain the working of voltage tripler and mention the applications of voltage multipliers.
14. Explain the working of SCR full wave rectifier, draw the relevant waveforms and analyse the circuit for resistive loads.
15. Draw the circuit diagram of SCR Series inverter and explain its working.
16. Explain the principle of dielectric heating. Mention its applications.

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**ELECTRONICS: LAB – 6A**  
**Industrial Electronics**

**(ANY SIX EXPERIMENTS SHOULD BE DONE)**

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

**GOVT. COLLEGE FOR MEN (AUTONOMOUS), KADAPA**

Semester-wise Revised Syllabus under CBCS, 2022-23

Three Year B.Sc.

Domain Subject: **ELECTRONICS**

III Year B.Sc., - Semester – V

**Course 7A: Electronic Instrumentation**

(Skill Enhancement Course (Elective), 3+2 Credits)

Max. Marks: Theory:100 + Practical:50

**UNIT-I: INTRODUCTION TO INSTRUMENTS (9 hrs)**

Types of electronic Instruments- Analog instruments & Digital Instruments, DC Voltmeter and AC Voltmeter, Construction and working of an Analog Multimeter and Digital Multimeter (Block diagram approach), Sensitivity, Signal generators-Sine wave generator, Square wave generator, Basic ideas on Function generator

**UNIT-II: OSCILLOSCOPE (9 hrs)**

Introduction. Different types of oscilloscopes. Cathode Ray Oscilloscope - Introduction, Block diagram of basic CRO, Time base operation, Vertical deflection system, Horizontal deflection system, Digital Oscilloscopes-Introduction, Block diagram, Construction and working Applications of Oscilloscopes (Voltage and frequency measurements). Advantages and limitations of Digital Oscilloscope over CRO

**UNIT-III: TRANSDUCERS (9 hrs)**

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

**UNIT-IV: DISPLAY INSTRUMENTS (9 hrs)**

Introduction to Display devices, Seven Segment Displays, Construction and operation (Display of numbers), Types of SSDs (Common Anode & Common Cathode type), Limitations of SSDs, LED Displays, Liquid Crystal Displays, Principle and working of 2x16 display and 4x16 LCD modules, Applications of LCD modules.

**UNIT-V: BIOMEDICAL INSTRUMENTS (9 hrs)**

Basic operating principles and uses of (i) Clinical thermometer (Analog and Digital) (ii) Stethoscope (iii) Sphygmomanometer (iv) ECG machine (v) Radiography (vi) Ophthalmoscope (vii) Ultrasound scanning (viii) Ventilator (ix) Pulse-Oximeter (x) Glucometer, Basic ideas of CT scan and MRI scan.

**III Reference Books:**

1. Electronic Instrumentation by H.S. Kalsi , TMH Publishers
2. Electronic Instrument Hand Book by Clyde F. Coombs , McGraw Hill
3. Introduction to Biomedical Instrumentation by Mandeep Singh, PHI Learning.

4. Biomedical Instrumentation and Measurements by Leslie Cromwell  
Prentice Hall India.
5. Electronic Measurements and Instrumentation by Kishor, K Lal, Pearson, New Delhi
6. Electrical and Electronic Measurements by Sahan, A.K., Dhanpat Rai, New Delhi
7. Electronic Instruments and Measurement Techniques by Cooper, W.D.  
Halfbrick, A.B., PHI Learning, New Delhi
8. Web sources suggested by the teacher concerned and the college librarian including reading material.

### Course 7C: Electronic Instrumentation– PRACTICAL SYLLABUS

*(30 Hrs. Max Marks: 50)*

#### **Practical (Laboratory) Syllabus: (30 hrs. Max marks: 50)**

1. Familiarization of digital multimeter and its usage in the measurements of (i) resistance (ii) current, (iii) AC & DC voltages and for (i) continuity test (ii) diode test and (iii) transistor test
2. Measure the AC and DC voltages, frequency using a CRO and compare the values Measured with other instruments like Digital multimeter.
3. Formation of Sine, Square wave signals on the CRO using Function Generator and measure their frequencies. Compare the measured values with actual values.
4. Display the numbers from 0 to 9 on a single Seven Segment Display module by Applying voltages.
5. Display the letters **a** to **h** on a single Seven Segment Display module by applying voltages.
6. Measurement of body temperature using a digital thermometer and list out the error and corrections.
7. Measurement of Blood Pressure of a person using a B.P. meter and record your values and analyze them.
8. Get acquainted with an available ECG machine and study the ECG pattern to understand the meaning of various peaks
9. Observe and understand the operation of a Digital Pulse oxymeter and measure the pulse rate of different people and understand the working of the meter.

### v. Lab References:

1. Electronic Measurement and Instrumentation by J.P. Navani. ,S Chand & Co Ltd
2. Principles of Electronic Instrumentation by A De Sa, Elsevier Science Publ.
3. Electronic Measurements and Instrumentation by S.P.Bihari, Yogita Kumari, Dr. Vinay Kakka, Vayu Education of India .
4. Laboratory Manual For Introductory Electronics Experiments by Maheshwari, New Age International (P) Ltd., Publishers.
5. Electricity-Electronics Fundamentals: A Text-lab Manual by Paul B. Zbar ,Joseph Sloop, & Joseph G. Sloop, McGraw-Hill Education.
6. Web sources suggested by the teacher concerned.

**GOVT. COLLEGE FOR MEN (AUTONOMOUS), KADAPA**  
**B.Sc Second Year Degree III Semester Examination**  
**Part II - Electronics**

**PAPER-VII(A): ELECTRONIC INSTRUMENTATION**

**(w.e.f 2022-23)**

Time: 3 hours

Max. Marks: 60

**Section A**

**Answer any FIVE of the following. Each carries 4 marks.**

**5X4 = 20 marks**

1. Differentiate between analog and digital instruments.
2. Write brief note on function generator.
3. Explain time-based operation of CRO.
4. Write advantages of digital oscilloscope over CRO
5. What is a transducer? Explain classification of transducers
6. Write a short note on fiber optic sensors
7. Explain construction of seven segment display.
8. Explain function of ventilator

**SECTION B**

**Answer any FIVE of the following. Each carries 8 marks.**

**5X8 = 40 marks**

9. Explain construction and working of digital multimeter with the help of block diagram
10. Explain construction and working of digital oscilloscope.
11. Explain the principle and working of piezoelectric transducer and write their applications
12. Describe the construction of LVDT, and illustrate its working mechanism
13. Elucidate the construction and operation of seven segment display
14. Write down principle and working of 4x16 LCD modules and write applications of LCD modules.
15. Explain working of digital clinical thermometer and sphygmomanometer
16. Discuss the working of ultrasound scanning.

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**GOVT. COLLEGE FOR MEN (AUTONOMOUS), KADAPA**

Semester-wise Revised Syllabus under CBCS, 2022-23

Three Year B.Sc.

Domain Subject: **ELECTRONICS**

III Year B.Sc., - Semester – V

**Course 6B: Embedded systems design**

(Skill Enhancement Course (Elective), 3+2 Credits)

Max. Marks: Theory:100 + Project:50

**UNIT 1: (10Hrs)**

Introduction to Embedded Systems:

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

**UNIT 2: (15Hrs)**

Custom Single Purpose Processor – Hardware Development:

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

**UNIT 3: (15Hrs)**

General Purpose Processor – Software Development:

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

**UNIT 4: (10Hrs)**

RTWA for Embedded Systems:

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

**UNIT 5: (10Hrs)**

Advanced Communication Principles:

Parallel Communication, Serial Communication, Wireless Communication, Serial Protocols: I<sup>2</sup>C, CAN, FireWire, and USB. Parallel Protocols: PCI BUS and ARM BUS. Wireless Protocols: IrDA, Bluetooth, and IEEE 802.11.

**TEXT BOOKS:**

1. Embedded System Design – A Unified Hardware / Software Introduction By Frank Vahid / Tony Givargis – WILEY EDITION.

2. Embedded Systems Architecture, Programming and Design – 2<sup>nd</sup> Edition By Raj Kamal – Tata McGraw-Hill Education.

**REFERENCES:**

An Embedded Software Premier - David E- Siman, PEARSON

Education Embedded / real - time systems - DR. K.V.K.K. Prasad, dreamtech

The art of programming Embedded systems, Jack G. Ganssle, academic press Intelligent

Embedded systems, Louis L. Odette, Adison Wesley, 1991

**GOVT. COLLEGE FOR MEN (AUTONOMOUS), KADAPA**  
**B.Sc Third Year Degree V Semester Examination**  
**Part II - Electronics**

**PAPER-VI(B): EMBEDDED SYSTEMS DESIGN**  
**(w.e.f 2022-23)**

Time: 3 hours

Max. Marks: 60

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**Part - A (5 X 4= 20 Marks)**

**Answer any FIVE of the following:**

1. What are the components of Embedded hardware system.
2. Explain design challenges of Embedded systems.
3. Explain various steps to design custom single purpose processor.
4. Explain combinational logic circuit design.
5. Write a short note on linker for embedded systems.
6. Briefly explain the operation of general-purpose processor.
7. Explain the working of Real time Clocks in embedded systems.
8. Write a short note on I2C protocol.

**Part - B (5x8=40 Marks)**

**Answer any FIVE of the following:**

9. Draw the block diagram of an embedded system. Explain the features of Embedded Systems.
10. Explain various technologies involved in designing an embedded system.
11. Explain in detail about RT Level custom single purpose processor.
12. Explain in detail about embedded software development tools.
13. Explain various debugging techniques used in Embedded Systems.
14. Explain the working of Stepper motor controller for embedded systems.
15. Distinguish between parallel and serial communication Principles. Explain USB Serial Protocol.
16. Write a short note on (a)PCI BUS and (b) ARM BUS

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**GOVT. COLLEGE FOR MEN (AUTONOMOUS), KADAPA**

Semester-wise Revised Syllabus under CBCS, 2022-23

Three Year B.Sc.

Domain Subject: **ELECTRONICS**

III Year B.Sc., - Semester – V

**Course 7B: Consumer Electronics**

(Skill Enhancement Course (Elective), 3+2 Credits)

Max. Marks: Theory:100 + Practical:50

**Unit – I(12hrs)**

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

**Unit – II(12hrs)**

**WASHING MACHINES** – Electronic controller for washing machines – Washing machine hardware and software – Types of washing machines – Fuzzy logic washing machines Features of washing machines.

**Unit – III(12hrs)**

**AIR CONDITIONERS AND REFRIGERATORS** - Air Conditioning – Components of air conditioning systems – All water air conditioning systems – All air conditioning systems – Unitary and central air conditioning systems – Split air conditioners.

**Unit – IV(12hrs)**

**HOME/OFFICE DIGITAL DEVICES** – Fascimile machine – Xerographic copier – calculators – Structure of a calculator – Internal organization of a calculator – Servicing electronic calculators – Digital clocks – Block diagram of a digital clock.

**Unit – V(12hrs)**

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

**TEXTBOOKS:**

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

## ELECTRONICS LAB

### CONSUMER ELECTRONICS LAB

**(At least two Activities should be done)**

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

NOTE: one activity as directed in practical course is equivalent to 4 experiments.

**GOVT. COLLEGE FOR MEN (AUTONOMOUS), KADAPA**  
**B.Sc Third Year Degree V Semester Examination**  
**Part II - Electronics**

**PAPER-VII(B): CONSUMER ELECTRONICS**

**(w.e.f 2022-23)**

Time: 3 hours

Max. Marks: 60

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**Part- A (5 X 4 = 20 Marks)**

**Answer any FIVE of the following:**

1. Explain the microwave oven safety instructions.
2. What are the uses of microwave oven?
3. Explain the features of washing machine.
4. Explain the different types of washing machine.
5. What is unitary air conditioning system.
6. How servicing the electronic calculators.
7. What is facsimile machine? And give the two uses of it.
8. How transfer the fund using ATM?

**Part - B (5x8=40 Marks)**

**Answer any FIVE of the following:**

9. Draw the block diagram of microwave oven and explain each block.
10. Explain the LCD timer with alarm in washing machine.
11. What is FUZZY logic washing machine.
12. Explain the hardware details of washing machine.
13. Explain the working of split air condition.
14. Draw the block diagram of digital clock and explain it.
15. Draw the structure of calculator. And explain each one.
16. Explain the details about digital cable TV.

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**GOVT. COLLEGE FOR MEN (AUTONOMOUS), KADAPA**

Semester-wise Revised Syllabus under CBCS, 2022-23

Three Year B.Sc.

Domain Subject: **ELECTRONICS**

III Year B.Sc., - Semester – V

**Course 6C: VLSI DESIGN**

(Skill Enhancement Course (Elective), 3+2 Credits)

Max. Marks: Theory:100 + Practical:50

**UNIT-I (12 hrs)**

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

**UNIT-II (12 hrs)**

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

**UNIT-III (12 hrs)**

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

**UNIT-IV (10 hrs)**

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

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

**UNIT-V (14 hrs)**

Data – Flow Description's and HDL programs:-

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

**TEXT BOOKS**

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

## **ELECTRONICS : LAB – 6C**

### **VHDL / Verilog HDL LAB**

(ANY SIX EXPERIMENTS SHOULD BE ONE)

- 1) BASIC GATES CIRCUIT
- 2) UNIVERSAL GATES
- 3) HALF –ADDER
- 4) FULL –ADDER
- 5) MULTIPLEXER
- 6) DECODER
- 7) S-R LATCH
- 8) D-LATCH
- 9) MAGNITUDE COMPARATOR
- 10) BINARY ADDER

**GOVT. COLLEGE FOR MEN (AUTONOMOUS), KADAPA**  
**B.Sc Third Year Degree V Semester Examination**  
**Part II - Electronics**

**PAPER-VI(C): VLSI DESIGN**

**(w.e.f 2022-23)**

Time: 3 hours

Max. Marks: 60

**SECTION-A**

**Answer any FIVE of the following questions**

**5 X 4M = 20**

**Marks**

1. Write a short note on classification of IC's.
2. Write the fabrication steps involved in designing p-well.
3. Write the differences between N-MOS and P-MOS Transistors.
4. Write a short note on NMOS Inverter.
5. Explain two input CMOS NOR gate configuration.
6. Explain shift and rotate operators in VHDL
7. Explain the data types in VHDL
8. Write data flow HDL code for magnitude comparator.

**SECTION-B**

**Answer any FIVE of the following questions**

**5 X 8M = 40**

**Marks**

9. Explain the Enhancement and depletion type MOS transistors.
10. Explain VLSI design flow.
11. Explain PMOS Inverter and CMOS Inverter.
12. Design and explain three input CMOS NAND gate.
13. Explain Arithmetic, Logical and Relational operators in VHDL.
14. Explain Logical, Relational, Arithmetic, Shift and Rotate Operators in Verilog HDL
15. Write Verilog code for Universal gates using data flow model.
16. Write Verilog code for Half Adder and Multiplexer using data flow model.

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**GOVT. COLLEGE FOR MEN (AUTONOMOUS), KADAPA  
A.P. STATE COUNCIL OF HIGHER EDUCATION**

Semester-wise Revised Syllabus under CBCS, 2020-21

Three Year B.Sc.

Domain Subject: **ELECTRONICS**

III Year B.Sc., - Semester – V

**Course 7C: DATA COMMUNICATION AND NETWORKING**

(Skill Enhancement Course (Elective), 3+2 Credits)

Max. Marks: Theory:100 + Practical:50

**UNIT –I (12 Hrs):**

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

**UNIT-II (14 hrs):**

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

**UNIT-III (10 Hrs):**

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

**UNIT-IV (10 Hrs):**

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

**UNIT – V (14 Hrs):**

Frequency Division Multiplexing, Time Division Multiplexing Wave Division Multiplexing. Modems: Traditional Modems, Cable Modems.

**TEXT BOOKS**

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

**ELECTRONICS: LAB – 7C**  
**DATA COMMUNICATION AND NETWORKING**  
**(ANY SIX EXPERIMENTS SHOULD BE DONE)**

1. TO STUDY DIFFERENT TYPES OF TRANSMISSION MEDIA.
2. TO STUDY THE SERIAL INTERFACE USING RS-232.
3. TO STUDY LAN USING STAR TOPOLOGY
4. TO STUDY LAN USING BUS TOPOLOGY
5. TO STUDY LAN USING TREE TOPOLOGY
6. TO STUDY CONFIGURE MODEM OF COMPUTER
7. TO STUDY CONFIGURE HUB/SWITCH
8. Analog to Digital Conversion
9. Digital to Analog conversion

**GOVT. COLLEGE FOR MEN (AUTONOMOUS), KADAPA**  
**B.Sc Third Year Degree V Semester Examination**  
**Part II - Electronics**

**PAPER-VII(C): DATA COMMUNICATION AND NETWORKING**

**(w.e.f 2022-23)**

Time: 3 hours

Max. Marks: 60

**SECTION-A**

**Answer any FIVE of the following questions**

**5 X 4M = 20**

**Marks**

1. Define data communication and write its components.
2. Write a short note on Bus Topology.
3. Write a short note Tree Topology.
4. What is transmission medium? What are the different types of transmission medium?
5. Write a short note on Radio waves.
6. Write about line coding and its characteristics.
7. Explain analog to analog conversion technique.
8. Write a short note on Traditional modems.

**SECTION-B**

**Answer any FIVE of the following questions**

**5 X 8M = 40**

**Marks**

9. Explain different types of Networks.
10. Explain the Star and Ring network topologies.
11. Explain the Mesh and Hybrid network topologies.
12. Write about Guided Medium.
13. Write about Micro Waves and Infrared Un-Guide Media.
14. Write about Analog to Digital and Digital to Analog conversion techniques.
15. Write about Data Transmission modes (Parallel and Serial).
16. What is Multiplexing and explain different types of Multiplexing?

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