B.Sc., Electronics Minor

SEMESTER-IV

COURSE 3: ELECTRICAL AND ELECTRONIC INSTRUMENTATION (w.e.f 2024-25)

Theory Credits: 3 3 hrs/week

UNIT-I

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

UNIT-II

DC and AC bridges: DC Wheatstone bridge - Kelvin's bridge - Balancing condition for AC bridge - Maxwell's bridge - Schering's bridge - Wein's bridge - Determination of frequency.

UNIT-III

Oscilloscopes: Block diagram of CRO - Deflection Sensitivity - Electrostatic Deflection - Electrostatic Focusing - CRT Screen - Measurement of Waveform frequency, phase difference and Time intervals - Sampling Oscilloscope - Analog and Digital Storage Oscilloscopes.

UNIT-IV

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

UNIT-V

Transducer and Display Devices: Strain Gauge - Unbounded Strain Gauge - LVDT -Resistive transducer - Photoelectric Transducer - Pen 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 andInstrumentation - *A.K. Sawhney*, Dhanpat Rai and Sons.
2. Electronic Instrumentation and Measurements -*P.B.Zbar*, McGraw Hill International.
3. Measurement Systems Application and Design - *Ernest O.Doebelin*, 4/e, TataMcGraw Hill Publishing Co. LTD

B.Sc., Electronics Minor

SEMESTER-III

COURSE 3: ELECTRICAL AND ELECTRONIC INSTRUMENTATION (w.e.f 2024-25)

Practical | Credits: 1 | 2 hrs/week

List of Experiments:

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 valuesMeasured 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 byApplying voltages.
5. Display the letters **a** to **h** on a single Seven Segment Display module by applyingvoltages.

Model Question Paper

GOVT. COLLEGE FOR MEN (AUTONOMOUS), KADAPA
B.Sc Second Year Degree IV Semester Examination

Part II – Electronics(Minor)

COURSE 3: ELECTRICAL AND ELECTRONIC INSTRUMENTATION
(w.e.f 2024-25)

Time: 3 hours Max. Marks: 60

Section A

Answer any *FIVE* of the following. Each carries 4 marks. 5X4 = 20 marks

1. How does a PMMC galvanometer operate?
2. What is a multimeter and what are its main functions.
3. Explain the working principle of a DC wheatstone bridge.
4. How can you measure the frequency of a waveform using CRO?
5. Write the differences between analog and digital oscilloscopes.
6. Explain the working of instrumentation amplifier.
7. What is the primary function of a spectrum analyser.
8. Explain about unbounded strain gauge.

SECTION B

Answer any *FIVE* of the following. Each carries 8 marks. 5X8 = 40 marks

9. Explain the procedure for converting galvanometer into a voltmeter.
10. Explain the construction and working principle of Maxwell's bridge. How is it used to measure inductance and resistance.
11. Explain the construction and working principle of wein's bridge. How is it used to measure the frequency of an AC signal.
12. Draw the block diagram of a CRO and explain each block.
13. Draw the block diagram of a function generator and explain each block.
14. Explain the function and operation of a wave analyser.
15. Explain working principle of an LVDT.
16. Write about LCD.

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B.Sc., Electronics Minor
SEMESTER-IV

COURSE 4: MICROPROCESSOR SYSTEMS
(w.e.f 2024-25)

Theory	Credits: 3	3 hrs/week

UNIT -I: (12Hrs)

CPU ARCHITECTURE *Introduction to Microprocessor, INTEL -8085(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, Instruction Execution timing, Addressing modes

UNIT -II: (12 Hrs)

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

UNIT -III: (12Hrs)

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

UNIT -IV: (12Hrs)

Basic 8086 Configurations – Minimum mode and Maximum Mode, Interrupt Priority Management I/O Interfaces: Serial Communication interfaces, Parallel Communication, Programmable Timers, Keyboard and display, DMA controller

UNIT -V: (12Hrs)
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.Gaonakar
2. Microcomputer Systems the 8086/8088 family – YU-Cheng Liu and Glenn SA Gibson
3. Microcontrollers Architecture Programming, Interfacing and System Design– Raj Kamal Chapter: 15.1, 15.2, 15.3, 15.4.1
4. 8086 and 8088 Microprocessor by Tribel and avatar singh

REFERENCES:

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

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SEMESTER-IV

COURSE 4: MICROPROCESSOR SYSTEMS
(w.e.f 2024-25)

Practical Credits: 1 2 hrs/week

List of Experiment

Programs using Intel 8085 /8086

1. Addition and Subtraction (8 bit and 16-bit)
2. Multiplication and Divition (8-bit)
3. Largest number in an array.
4. Smallest number in an array.
5. BCD to ASCII and ASCII to BCD .
6. Program To Convert Two Bcd Numbers In To Hex
7. Program To Convert Hex Number In To Bcd Number.
8. Program To Find The Square Root Of A Given Number.
9. Interfacing Experiments Using 8086 Microprocessor (Demo):

1. Traffic Light Controller
2. Elevator,
3. 7-Segment Display

Model Question Paper

GOVT. COLLEGE FOR MEN (AUTONOMOUS), KADAPA

B.Sc Second Year Degree IV Semester Examination
Part II – Electronics(Minor)

COURSE 4: MICROPROCESSOR SYSTEMS
(w.e.f 2024-25)

Time: 3 hours Max. Marks: 60

Section A

Answer any *FIVE* of the following. Each carries 4 marks. 5X4 = 20 marks

1. Explain the register organization of 8085 microprocessor.
2. Draw the pin diagram of 8086 microprocessor.
3. Draw the block diagram of 8086 microprocessor.
4. Explain the Arithmetic instructions.
5. Write an ALP to multiply two 8-bit numbers.
6. Write an ALP to convert ASCII to BCD.
7. Explain the interrupt priority management in 8086.
8. Write the features of ARM7 Processor.

SECTION B

Answer any *FIVE* of the following. Each carries 8 marks. 5X8 = 40 marks

9. Draw the block diagram of Intel 8085 microprocessor and explain each block.
10. Explain the addressing modes of 8085 microprocessor.
11. Explain the data transfer instructions with examples.
12. Explain the logical instructions with examples.
13. Write an ALP Program to find largest number in an array.
14. Write an ALP (i) to add two 16-bit numbers and (ii) to subtract two 16-bit numbers.
15. Explain the maximum and minimum modes of 8086 microprocessor.
16. Explain the architecture of ARM processor.

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