

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM
I B. Tech I Semester Supplementary Examinations June 2025
BASIC ELECTRICAL & ELECTRONICS ENGINEERING
(Common to ECE, EEE, MECH, CE & AME)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part A, Part B.
Part A is compulsory, Answer all questions.
In Part B, Answer any one question from each unit.

PART-A**(10 Marks)****Basic Electrical Engineering**

- 1 a) Describe the basic property of a capacitor. [1]
- b) Define power factor? [1]
- c) Mention the applications of DC Motor. [1]
- d) Write the principle of MI instrument. [1]
- e) What is earthing. [1]

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- f) List the applications of Zener diode. [1]
- g) Draw the symbols of PNP and NPN transistors. [1]
- h) Define rectifier? [1]
- i) Mention the blocks of electronic instrumentation system. [1]
- j) Write the Excess 3 code of $1101_{(2)}$. [1]

PART-B**(60 Marks)****Basic Electrical Engineering****Unit-1**

- 2 a) Explain KVL and KCL with suitable examples. [5]
- b) Find current flowing through r_3 using superposition theorem. Here $V_1=20V$, $V_2=10V$, $r_1=5\Omega$, $r_2=3\Omega$ and $r_3=2\Omega$ shown in Figure:1. [5]

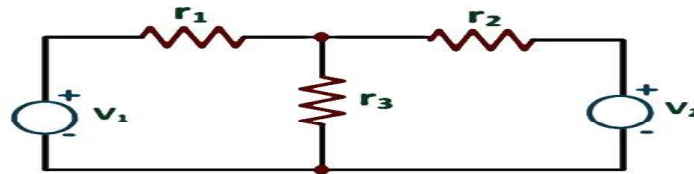


Figure:1

(OR)

- 3 a) Estimate form factor for the sinusoidal waveform $v=V_m \sin \omega t$. [5]
- b) Calculate current and power consumed by an AC circuit consists of a pure resistance of 20Ω and is connected across an AC supply of 230V, 50 Hz. [5]

Unit-2

- 4 a) Explain the construction and working of a single phase transformer with a neat sketch. [5]
b) Derive the condition for wheat stone bridge with neat circuit diagram under bridge balancing scenario. [5]

(OR)

- 5 a) Describe the principle of PMMC instrument with a neat diagram. [5]
b) Explain the working principle of DC generator. [5]

Unit-3

- 6 a) Explain solar power plant with a neat sketch. [5]
b) Describe the advantage of MCB over fuse. [5]

(OR)

- 7 a) Discuss two part tariff. [5]
b) Calculate total energy consumed per day by the use of following loads: [5]
i) 5 number of 40 W lights operated 5 hours per day ii) 1 h.p.(735 W) motor is operated 2 hours per day iii) 1 k. W heater is operated 1 hour per day iv) 10 W bulb is used for 6 hours per day.

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Unit-1

- 8 a) Illustrate the V-I characteristics of PN Junction Diode. [5]
b) Explain the operation of NPN transistor. [5]

(OR)

- 9 a) Describe the working of Zener diode. [5]
b) Explain the input and output characteristics of a transistor in CB configuration. [5]

Unit-2

- 10 a) Illustrate block diagram of a dc power supply. [5]
b) Describe the common emitter RC Coupled amplifier with neat diagram. [5]

(OR)

- 11 a) Explain the working of a Full wave bridge rectifier with input and output waveforms. [5]
b) Illustrate block diagram and description of public address system. [5]

Unit-3

- 12 a) Construct truth table for Full adder and design it using logic gates. [5]
b) Convert the following given numbers to indicated base numbers. [5]
i) $(1000101)_2 = ()_{10}$ ii) $(C5E)_{16} = ()_2$ iii) $(143)_8 = ()_{10}$
iv) $(10101)_2 = ()_8$

(OR)

- 13 a) Encode a binary word 1011 into the even parity hamming code. [5]
b) Construct truth table, logic symbol and Boolean expression for the logic gates. [5]
