

Code No: 154AE**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech II Year II Semester Examinations, February -2024****BASIC ELECTRICAL AND ELECTRONICS ENGINEERING****(Common to CE, ME, MMT, MIE, TTE)****Time: 3 Hours****Max. Marks: 75****Note:** i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A**(25 Marks)**

- 1.a) State KVL. [2]
- b) What is the relation between phase voltage and line voltage in case of star connection? [3]
- c) What are the components of the earthing system? [2]
- d) Write full form of MCCB. [3]
- e) Define Back EMF of a d.c. motor. [2]
- f) What are the advantages of Three phase transformer over single phase transformers? [3]
- g) What is the importance of peak inverse voltage of a diode? [2]
- h) Define cut in voltage in diodes. Explain its significance. [3]
- i) Why is the BJT called a current controlled device. [2]
- j) What is the current amplification factor in CE configuration of BJT? [3]

PART – B**(50 Marks)**

- 2.a) Explain the voltage divider and current divider rule for resistances connected in series and parallel.
- b) Three resistors are connected in series across a 12 V battery. The first resistance has value of $2\ \Omega$, second has voltage drop of 4V and third has a power dissipation of 12W. Calculate the value of circuit current. [5+5]

OR

- 3.a) Derive an expression for form factor of a sinusoidal wave form.
 - b) Define apparent power, active power and reactive power. [5+5]
 - 4.a) Write the advantages and disadvantages of fuse. Explain its operation.
 - b) Write short notes on MCB and ELCB. [5+5]
- OR**
- 5.a) Write short notes on the performance of Lead-acid Batteries.
 - b) How can power factor of a system be improved? [5+5]

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6.a) Derive the torque equation of a DC Motor.

b) A 250V shunt motor runs at 1000 rpm at no load and takes 8A. The total armature and shunt field resistances are 0.2 and 250 ohms respectively. Calculate the speed when loaded and taking 50A. Assume the flux to be constant. [5+5]

OR

7.a) What is voltage regulation of a transformer? Obtain the conditions for maximum and zero voltage regulation in a transformer.

b) A 100 kVA, 2400/240 V, 50Hz single phase transformer has an exciting current of 0.64A and a core loss of 700 W, when its high voltage side is energized at rated voltage and frequency. Calculate the two components of the exciting current. [5+5]

8.a) Explain the forward and reverse characteristics of a silicon diode.

b) With a neat circuit diagram and waveforms, explain the working of Bridge rectifier without filter. [5+5]

OR

9.a) With the help of suitable diagram, explain VI characteristics of Zener diode.

b) Illustrate the working of RC- π filter. [5+5]

10.a) Draw and explain the characteristics of an N-channel JFET.

b) With a neat diagram explain the operation of an PNP transistor. [5+5]

OR

11.a) With the help of suitable diagram, explain construction and operation of P-channel JFET.

b) With a neat diagram, explain the input and output characteristics of a transistor in common collector configuration. [5+5]

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