R18

Code No: 154AE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year II Semester Examinations, September/October - 2023
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)	Define the following: i) Resistance ii) Inductance.	[2]
b)	State the advantages of three phase balanced circuits.	[3]
c)	List the different types of cables.	[2]
d)	What are the advantages of earthing?	[3]
e)	What is the principle of operation of a single phase transformer?	[2]
f)	Explain the significance of back emf.	[3]
g)	What are the different types of filters?	[2]
h)	Draw the zener diode characteristics.	[3]
i)	What is the function of FET?	[2]
j)	Write the principle of operation of BJT.	[3]

PART - B

(50 Marks)

2.a) Define the following: i) Alternating Quantity ii) R.M.S Value iii) Average Value iv) Form factor.

b) A circuit consisting of a resistor in series with a capacitor takes 100 watts at a power factor of 0.5 from a 100V, 50Hz supply. Find
i) The current flowing in the circuit
ii) Phase angle
iii) Resistance
iv) Capacitance and
v) Impedance. [5+5]

OR

3.a) Explain the differences between series circuit and parallel circuits.

b) A coil has a reactance of 25 ohms and an inductance of 1 Henry. If an A.C. voltage of 200 V (rms), 50 Hz is applied across the coil, find the input current, power factor, real power and reactive power flow in the coil. [5+5]

4. Write a note on the following:
   a) MCB
   b) Power factor improvement. [5+5]

OR

5. Explain in detail the different types of batteries and their characteristics. [10]

6.a) Derive the EMF equation of a single phase transformer.
   b) An 8 pole DC generator has 500 armature conductors and useful flux per pole of 0.065 wb. What will be the EMF generated if it is lap connected and runs at 1000 rpm? At what speed it must be driven to produce the same EMF if it is wave connected?[5+5]

OR

7.a) Discuss the principle of operation of Induction Motor.
   b) An 8 pole lap connected armature has 40 slots with 12conductors per slot, generates a voltage of 500V. Determine the speed at which it is running if the flux per pole is 50mWb. [5+5]

8.a) Draw circuit of a half-wave rectifier and show the input and output voltage waveforms.
   b) Explain the working of P-N junction diode. [5+5]

OR

9. Explain the operation of a full wave rectifier with a neat diagram and output waveforms. [10]

10.a) Explain the operation of the transistor as an amplifier in Common-Emitter (CE) configuration.
   b) Obtain the input and output characteristics of Common-Base (CB) connection. [5+5]

OR

11. Explain the constructional details and principle of operation of FET in detail. [10]

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