Code No: 151AG

R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year I Semester Examinations, December – 2019/January - 2020
BASIC ELECTRICAL ENGINEERING
(Common to EEE, CSE, IT, ITE)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	What are the initial conditions?	[2]
b)	Define the RMS value.	[2]
c)	What are the ideal properties of transformer?	[2]
d)	Define synchronous speed.	[2]
e)	What are the merits of fuse?	[2]
f)	State the Thevenin's theorem.	[3]
g)	What are the merits of polyphase system?	[3]
h)	Draw the different 3-phase transformers connections.	[3]
i)	What is the purpose of dampers in a synchronous generator?	[3]
j)	What is the need of power factor improvement?	[3]

PART – B

(50 Marks)

2.a) Explain the Kirchoff's current and voltage laws.
b) For the circuit as shown in following figure 1, calculate the current in the various branches? (All resistances are in ohms). [5+5]

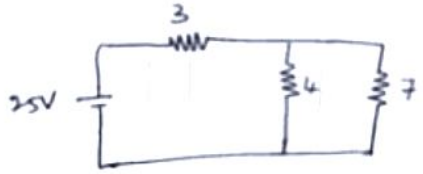

Figure: 1

OR

3.a) A Series R-L circuit is supplied by DC voltage. Determine the expression for i(t) when the switch is closed at t=0.
b) Using superposition theorem, find the current through the 8 Ω resistor, as shown in below figure 2. [5+5]

Figure: 2

4.a) Define the following terms:
i) Frequency
ii) Peak factor
iii) Form factor
iv) Average value of an alternating quantity.
b) A series RLC circuit consists of R= 3 ohm, L= 2mH and C=0.4 μF. Determine the resonant frequency. [5+5]

OR

5.a) Derive the relation between line and phase quantities of voltage and current for a delta system.
b) Determine the line currents when a star connected balanced load with an impedance of (15+j10) ohms is connected to 200V, three phase balanced supply in positive sequence. [5+5]

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6.a) From the fundamentals, derive the expression for the EMF equation of a single phase transformer.

b) A 50 kVA, single phase transformer has 500 turns on the primary and 200 turns on the secondary. The primary is connected to 2000V, 50 Hz Supply. Determine: i) The secondary voltage and ii) The maximum value of flux. [5+5]

OR

7.a) What is a transformer? How does it transfer electrical energy from one circuit to another?

b) The primary and secondary voltage of an autotransformer are 500V and 400V respectively. Determine the economy in copper. [5+5]

8.a) Explain the principle of operation of 3-Phase induction Motor.

b) A 10-pole, 3-phase induction motor runs at a speed of 485 rpm at 50 Hz supply. Determine i) synchronous speed and ii) slip. [5+5]

OR

9. Explain the working principle of synchronous generator. [10]

10.a) How the cables/ wires are classifies and list out.

b) What are the advantages of earthing? [5+5]

OR

11. What are the types of batteries? Explain. [10]

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