Program: B. Tech, Course: Computer Science and Engineering (Artificial Intelligence & Machine Learning)
Subject: Basic Electrical & Electronics Engineering, Code: ETEE105
Semester: I

Time: 03 Hours **Max Marks: 70**

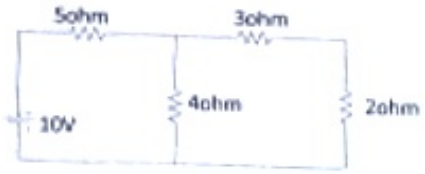
Instructions to the Students:

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of short answer type. All questions are compulsory. Each question carries 02 marks.
3. Section B comprises 8 long answer type questions out of which students must attempt any 5. Each question carries 10 marks.
4. Do not write anything on the question paper.

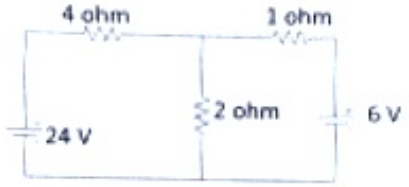
Q.No.	SECTION –A (SHORT ANSWER TYPE QUESTIONS)	Marks
1. a.	Distinguish between reactive, active and apparent power with their symbolic representation on power triangle.	(2)
b.	Calculate 4A source with its parallel resistance of 15ohms into its equivalent voltage source.	(2)
c.	A 25kVA single-phase transformer has 500 turns on the primary and 40 turns on the secondary winding. The primary is connected to 3000V, 50Hz. Assuming an ideal transformer, calculate primary and secondary current	(2)
d.	Derive the EMF equation of transformer.	(2)
e.	Draw the torque-slip characteristics of an induction motor with specifying the break down torque on the graph.	(2)
f.	A three phase 50 Hz synchronous generator runs at 375rpm. Find the number of poles of machine.	(2)
g.	Convert the following octal number to binary $(375.37)_8=(\ )_2$	(2)
h.	Draw symbols of NAND gate and NOR gate.	(2)
i.	Design truth table of OR gate with its symbol.	(2)
j.	Draw symbols of PN junction diode and Zener Diode.	(2)

SECTION –B (LONG ANSWER TYPE QUESTIONS)

2. a) Calculate the current through 2ohm resistor using Thevenin's theorem (5)



b) Calculate the current across 2ohm resistor using Kirchhoff's Laws (5)



3. Compare star and delta connections. If three resistances are connected in delta connections, illustrate the conversion to star connection. (10)

4. Justify with reasons can transformer work on DC supply? Illustrate various types of transformer losses in detail. (10)

5. A 30KVA, 2000/200V, 1 phase 50Hz transformer has a primary resistance of 3.5ohms and reactance of 4.5ohm. The secondary resistance and reactance are 0.015ohm and 0.02ohm respectively. Find (10)
   (i) equivalent resistance, reactance and impedance refer to primary side
   (ii) Total Copper losses of transformer

6. a) Distinguish between EX-NOR and EX-OR gate with their logical symbol and truth table. (10)

   b) Formulate the OR logic using NAND gates only.

7. Sketch schematic diagram of DC motor and demonstrate its working with its EMF equation. Also, explain various characteristics of various types of DC motors. (10)

8. a) A three phase induction motor is wound for 4 poles and is supplied from a 50Hz system. Calculate (5)
   (i) synchronous speed
   (ii) actual speed of motor when running at 4% slip

   b) Differentiate between conductors, insulators and semiconductors. (5)

9. Explain working, characteristics of P-N junction diode and concept of avalanche breakdown (10)

==END OF PAPER==