MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

I B.Tech II Sem Regular/Supply End Examination, September 2022
Basic Electrical Engineering
(Electrical and Electronics Engineering)

Time: 3 Hours.   Max. Marks: 70

Note: 1. Question paper consists: Part-A and Part-B.
2. In Part – A, answer all questions which carries 20 marks.
3. 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
(10*2 Marks = 20 Marks)

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1. a)	Define linear and nonlinear elements.	2M	CO1	BL1
b)	State Superposition theorem.	2M	CO1	BL2
c)	Define the Frequency and Peak factor.	2M	CO2	BL1
d)	A coil having a resistance of 10 ohms and an inductance of 0.2H is connected in series with a $100×10^{-6}F$ capacitor across a 230V, 50Hz, determine the active and reactive components of the power.	2M	CO2	BL4
e)	Write different types of losses in transformers.	2M	CO3	BL2
f)	Develop the equivalent circuit of a single-phase transformer.	2M	CO3	BL3
g)	What is the necessity of starter in starting of a 3-Φ Induction motor?	2M	CO4	BL4
h)	Describe the torque speed characteristics of separately excited dc motor.	2M	CO4	BL3
i)	What is the need of power factor improvement?	2M	CO5	BL5
j)	What is the difference between fuse unit and switch fuse unit?	2M	CO5	BL5

PART- B
(10*5 Marks = 50 Marks)

2 a)	State and explain Thevenin's theorem.	5M	CO1	BL2
b)	Calculate the power absorbed by each component in the circuit shown in figure.	5M	CO1	BL6
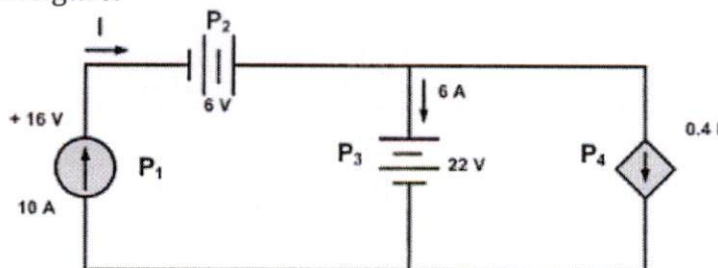
OR

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3 a)	Explain about different types of sources.	5M	CO1	BL3
b)	State Kirchhoff Current Law and Voltage law, determine the values for I_X and V_Y in the following given circuit shown in figure.	5M	CO1	BL2
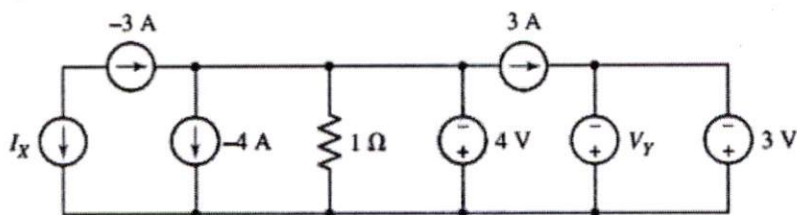
4	a)	Derive the relation between phase and line voltages and currents in balanced three phase star connection.	5M	CO2	BL3
	b)	Compute the average value of square wave form shown in below figure.	5M	CO2	BL3
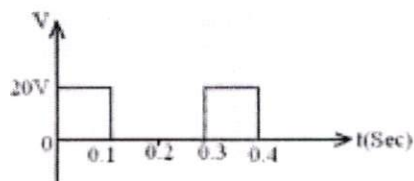
OR

5	a)	Derive the relation between phase and line voltages and currents in balanced three phase star connection.	5M	CO2	BL1
	b)	Determine the line and phase current of the load, when a delta connected balanced load with an impedance of $(25+j15)$ ohms is connected to 230V, three phase balanced supply in positive sequence.	5M	CO2	BL6
6	a)	Describe the principle of operation of auto transformer, what is the saving of copper in this transformer when compared with two winding transformers?	5M	CO3	BL4
	b)	The core of a 100 kVA, 11000/550V, 50 Hz, single phase core type transformer has a cross section of 20cm × 20 cm. Determine i) the number of H.V. and L.V turns per phase and ii) the e.m.f. per turn, if the maximum core density is 1.3 tesla.	5M	CO3	BL4

OR

7	a)	Explain regulation of a transformer with phasor diagrams.	5M	CO3	BL2
	b)	Explain the different 3-phase transformers connections with neat diagram.	5M	CO3	BL3

8	a)	Explain the working principle of synchronous generator.	5M	CO4	BL2
	b)	Describe the constructional details of three phase slip ring induction motor.	5M	CO4	BL2

OR

9	a)	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	5M	CO4	BL6
	b)	What are the various losses occurs in the three phase induction motor in their operation?	5M	CO4	BL3

10	a)	Describe the operation of ELCB with its schematic diagram.	5M	CO5	BL2
	b)	Describe the PVC cables of different types and their sizes which are used for low voltage ratings?	5M	CO5	BL2

OR

11	a)	Calculate total energy consumed per day by the use of following loads: i) 5 number of 40 W lights operated 5 hours per day ii) 1 h.p. motor is operated 2 hours per day iii) 1 k.W heater is operated 1 hour per day iv) 1 computer is used for 6 hours per day with printer about 30 minutes.	5M	CO5	BL5
	b)	Describe the miniature circuit breaker with neat diagrams.	5M	CO5	BL3

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