Enrolment No. 242802060103 0

BHAGWAN MAHVIR UNIVERSITY

B.TECH SEMESTER I/II EXAMINATION WINTER 2024

Subject Code: 1010204201/2010204101 **Date:27/01/2025**

Subject Name: Basic Electrical Engineering-Theory

Time:2.00PM TO 4.30PM **Total Marks: 60**

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

			Marks
Q.1	(a)	Find the equivalent resistance for following circuit Fig. 1	02

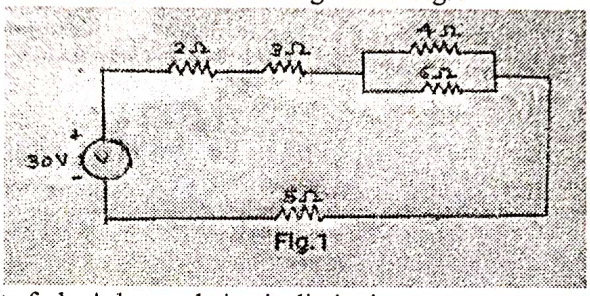

Fig.1

	(b)	Give statement of ohm's law and give its limitations.	04
	(c)	Determine the value of R so that the current supply by the battery is 5A. Use Figure A.	06

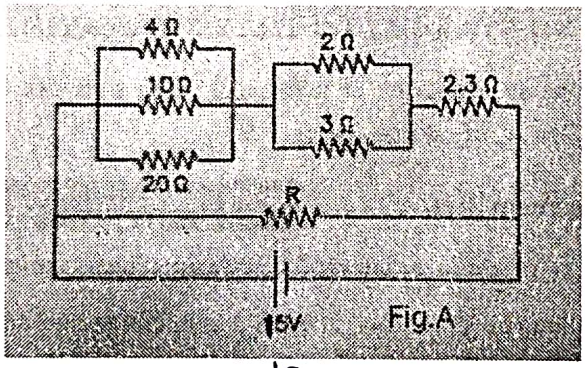

Fig.A

15V

Q.2	(a)	Define: current, voltage	02
	(b)	Explain factor affecting the resistance value.	04
	(c)	A Capacitor of value 100μF is connected across a 200V, 50Hz supply. Calculate : a) reactance of the capacitor, b) r.m.s. value of the current, c) the maximum current.	06
		OR	
	(c)	Two capacitors C_1=4μF and C_2=2μF are connected in parallel across a 200V DC supply. Find : a) Equivalent capacitance b) Charge across each capacitor c) If these parallel capacitor combinationconnected in series with 6μF then what would be the equivalent capacitance of circuit become?	06
Q.3	(a)	Define: Waveform, Time period.	02
	(b)	Give comparison at AC with DC.	04

	(c)	Derive expression for Q factor.	06
		OR	
Q.3	(a)	Give characteristic of magnetic flux lines.	02
	(b)	Give comparison of core and shell type Transformers.	04
	(c)	Derive the E.M.F. equation of Single phase transformer.	06
Q.4	(a)	Give classification of magnetic materials.	02
	(b)	Give comparison of practical transformer and ideal transformer.	04
	(c)	A 10kVA, 2000/400V single phase transformer has R1=5 ohm, X1=12ohm, R2=0.2ohm, X2=0.48ohm. Determine the equivalent impedance of the transformer referred to (a) Primary side (b) Secondary side.	06
		OR	
Q.4	(a)	Define magnetic flux, Permeability.	02
	(b)	Explain slip in induction motor and what is the frequency of rotor current?	04
	(c)	An 8 Pole, 3 phase induction motor is connected to 50 Hz supply. If it is running at 720 r.p.m. Find the Slip.	06
Q.5	(a)	What is rotating magnetic field?	02
	(b)	Give comparison between fuse and MCB.	04
	(c)	Explain safety precaution for Electrical appliances.	06
		OR	
Q.5	(a)	Give classification of types of DC motors.	02
	(b)	Give advantages, disadvantages and applications of 3-phase induction motor.	04
	(c)	A bungalow has following load connected in it, 1. 40 Watt tube light 12 Nos switch on For 4 hours/day 2. 60 Watt ceiling fan 7 Nos switch on for 6 hours/day 3. 100 Watt 165 liter refrigerator switch on for 12 hours/day 4. 100 Watt TV set switch on for 5 hours/day 5. 40 Watt computer switch on 8 hours/day 6. 500 Watt A.C. 2 Nos, switch on 6 hours/day 7. 100 watt water pump switch on 2 hours/day Estimate the monthly electricity bill of the bungalow if energycost is Rs.5/- per unit	06