

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2023**

ELECTRIC CIRCUITS & NETWORKS

[Maximum Marks: 75]

[Time: 3 Hours]

PART-A

I. Answer *all* the following questions in one word or one sentence. Each question carries 'one' mark.

(9 x 1 = 9 Marks)

		Module Outcome	Cognitive level
1.	Define form factor of an alternating waveform.	M1.01	R
2.	In a series RLC circuit, resonance occurs when.....	M1.02	R
3.	Define Ohms law.	M2.02	R
4.	Which transformer has primary and secondary winding coupled electrically and magnetically?	M2.04	R
5.is the EMF equation of a DC Generator.	M3.01	R
6.	Current drawn by the armature of a DC motor is directly proportional to.....	M3.02	R
7.	Mention the two types of rotor employed in alternator.	M4.01	R
8.	The rotational speed of amotor is determined by the input pulse frequency.	M4.03	R
9.	AC motor used in mixer grinder is.....	M4.03	R

PART-B

II. Answer any *eight* questions from the following. Each question carries 'three' marks.

(8 x 3 = 24 Marks)

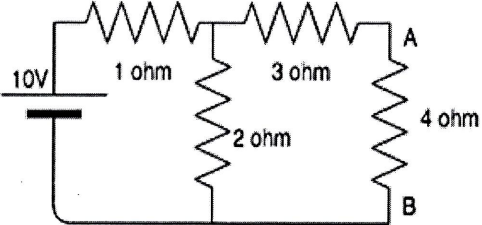
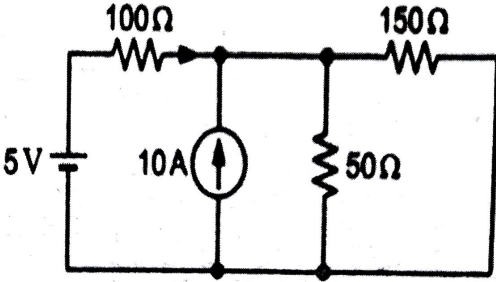
		Module Outcome	Cognitive level
1.	Define the following terms. (i) Power factor (ii) Reactive power	M1.01	R
2.	Draw the phasor diagram of the R-C series circuit and describe the phasor components.	M1.03	R
3.	Compare performance parameters of Series and parallel RLC Circuits.	M1.04	U
4.	Define the following terms in network. (i) Node (ii) mesh and (iii) maximum power transfer theorem.	M2.01	R
5.	Explain the different iron losses in a transformer.	M2.03	U
6.	List the different types of transformer and its applications.	M2.04	R
7.	Explain armature reaction and its effects.	M3.01	U
8.	List different types of ac motors.	M4.02	R
9.	Explain the working of universal motor.	M4.02	U
10.	List the applications of servomotors.	M4.03	R

PART-C

Answer all questions from the following. Each question carries 'seven' marks

(6 x 7 = 42 Marks)

Module Outcome Cognitive level

III.	A 50Hz voltage of 230V effective value is impressed on a capacitance of $26.5\mu\text{F}$. (i) Write the time equations for the voltage and the resulting current. Let the zero axis of the voltage wave be at $t=0$. (ii) Show the voltage and current on a time diagram and (iii) Show the voltage and current on a phasor diagram.	M1.03	A
OR			
IV.	A resistance of 20Ω , an inductance of 0.2H and a capacitance of $100\mu\text{F}$ are connected in series across 220V, 50Hz mains. Determine the following (i) Impedance (ii) Current (iii) Voltage across R, L and C (iv) Power factor.	M1.04	A
V.	Calculate the Thevenin resistance, Thevenin voltage and voltage across the 4 ohm resistor for the following circuit.	M2.02	A
			
OR			
VI.	Find the current flowing through the 100Ω resistor using the superposition theorem.	M2.02	A
			
VII.	State and explain Kirchoff's voltage law and current law.	M2.01	U
OR			
VIII.	Derive the EMF equation of transformer.	M2.03	U
IX.	Explain the working principle of DC Generator.	M3.01	U
OR			
X.	Explain the working of a 3-point starter.	M3.03	U
XI.	Explain the working principle of DC motor.	M3.02	U
OR			
XII.	Draw and describe the classification of DC generators according to field connection.	M3.01	U
XIII.	Explain the working of an AC servomotor.	M4.03	U
OR			
XIV.	Compare squirrel cage and slip-ring induction motor.	M4.04	R
