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EAST POINT COLLEGE OF ENGINEERING & TECHNOLOGY
An Autonomous Institution Affiliated to Visvesvaraya Technological University (VTU) Belagavi

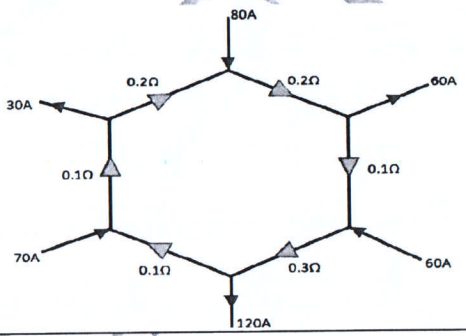
USN | | | | | | | | | |

25ES142/25ES242

First/Second Semester B.E. Degree Examination, June/July 2026
INTRODUCTION TO ELECTRICAL ENGINEERING

TIME:3 hrs. Max.Marks:100

Note: 1. Answer **any FIVE** full questions, choosing **ONE** question from **each MODULE.**
2. Formula Hand Books Permitted.
3. M: Marks, L: Bloom's level, C: Course outcomes.
4. Assume missing data suitably.

		Module-1	M	L	C
Q.1	a	Explain the various steps of electrical power transmission and distribution system using single line diagram.	06	L2	CO1
	b	State and explain Kirchoff's current and voltage law and write their general mathematical expression.	06	L2	CO1
	c	Find the values of currents in all the branches of the network shown in figure 	08	L3	CO1
		OR			
Q.2	a	Differentiate the Conventional and Non-Conventional energy sources	06	L2	CO1
	b	A resistance R is connected in series with a parallel circuit comprising of two resistances 12Ω and 8Ω respectively. The total power in the circuit is 70W.If the applied voltage is 20V,Calculate the unknown resistance R.	08	L3	CO1
	c	State and explain Ohm's law along with its limitations.	06	L2	CO1
		Module–2			
Q.3	a	A pure inductor excited by sinusoidal varying AC voltage ,show that the average power consumed by inductor is zero with the appropriate diagrams.	08	L2	CO2
	b	Explain the Generation of a three phase system with the appropriate diagram?	06	L2	CO2
	c	A series RLC circuit is composed of 10Ω resistor,0.1H inductor and 50μf capacitor. A voltage of V=141.4sin100πt is imposed upon the circuit. Determine the following. i)Current ii)V_R,V_L,V_C. iii)Active power	06	L3	CO2
		OR			
Q.4	a	Define the following: 1)Reactive power 2)R.M.S value 3)Form Factor 4)Peak factor	06	L2	CO2

	b	Explain the relationship between the Phase and Line voltages and currents for a Delta connected system.	08	L2	CO2
	c	Find phase current and Line current when three impedances of 5+6jΩ are connected in i)Star and ii) Delta Supply voltage is 400V and 50Hz.	06	L3	CO2
		Module–3			
Q.5	a	Derive the Torque equation of a D.C motor.	08	L2	CO3
	b	A 6-pole Lap wound shunt motor has 500 conductors .The armature and field resistances are 0.05Ω and 25Ω respectively .Find the speed of motor if it takes 120A from a D.C supply of 100V.Flux per pole is 20mwb.	06	L3	CO3
	c	Derive E.M.F equation of D.C generator.	06	L2	CO3
		OR			
Q.6	a	With the help of a neat diagram explain the construction of a D.C generator.	08	L2	CO3
	b	Explain the characteristics of a D.C shunt motor.	06	L2	CO3
	c	An 8-pole Lap connected armature has 960 conductors, a flux of 40mwb per pole and a speed of 400 rpm. Calculate the EMF generated ,if the armature were wave connected at what speed must it be driven to generate 400V.	06	L3	CO3
		Module–4			
Q.7	a	A 100KVA,6600/400V,50Hz single phase transformer has 80 turns on the low voltage winding. Calculate i)the maximum flux in the core ii)the number of turns on the high voltage winding iii)the current in each winding iv)voltage per turn.	08	L3	CO4
	b	Derive an EMF equation of transformer with usual notations.	06	L2	CO4
	c	Bring out the difference between squirrel cage and slip ring induction motor.	06	L2	CO4
		OR			
Q.8	a	Explain the production of rotating magnetic field in air gap of a three phase induction motor.	06	L2	CO4
	b	Explain various losses in a transformer and explain how they are minimized.	08	L2	CO4
	c	A 3Φ,50Hz 4 pole induction motor, its rotor induced emf is 1.5Hz frequency. Calculate i)Synchronous speed ii)Full load speed iii)Actual speed.	06	L3	CO4
		Module–5			
Q.9	a	What is electric shock? List the preventive measures against the shock.	06	L2	CO5
	b	With the neat diagram and truth table explain 3-way control of lamp.	08	L2	CO5
	c	A consumer has a maximum demand of 200KW at 40% load factor.If the tariff is 100 per KWh of maximum demand plus 10 paise per KWh,find the monthly charges(30 days).	06	L3	CO5
		OR			
Q.10	a	What is Earthing? With the neat diagram explain any one type of Earthing.	08	L2	CO5
	b	What are the desirable characteristics of tariff and explain two part tariff.	06	L2	CO5
	c	Differentiate a fuse and a miniature circuit breaker	06	L2	CO5

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