USN | | | | | | | | | | |

EPESK104B/EPESK204B

EPCET LIBRARY BANGALORE-49

First/Second Semester B.E. Degree Examination, July 2025
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.

		Module-1	M	L	C
Q.1	a	Mention the difference between conventional and non-conventional energy sources with examples.	6	L1	CO1
	b	With the single line diagram approach, explain electrical power systems.	7	L2	CO1
	c	Explain the solar power generation with block diagram.	7	L2	CO1
		OR			
Q.2	a	Explain Ohm's law. What is its limitation?	6	L2	CO1
	b	Explain Kirchoff's voltage and currentlaw with an example.	7	L2	CO1
	c	A current of 20 A flows through two ammeters A and B in series. The potential difference across A is 0.2 V and B is 0.3 V. Find how the current will divide between A and B when they are in parallel.	7	L3	CO1
		Module–2			
Q.3	a	With respect an ac sinusoidal voltage what is (i) Frequency (ii) Time period (iii) peak value (iv) average value (v) rmsvalue and (vi) form factor.	6	L2	CO2
	b	Write an expression for instantaneous voltage having frequency of 50 Hz and rms value of 200 V.	7	L3	CO2
	c	Voltage across a series RL circuit with R=10 Ω and L=0.15 H is v=200sin(100πt) V. Write the expression for instantaneous current and calculate active power, reactive power and apparent power.	7	L3	CO2
		OR			
Q.4	a	What are the necessities of three phase system?	6	L1	CO2
	b	With the diagram, write the relationships between line and phase voltages and currents in (i) star connected system (ii) delta connected system.	7	L2	CO2
	c	Find phase current and line current when three impedances of 5+j6 Ωare connected in (i) star and (ii) delta. Supply voltage is 400 V, 50 Hz.	7	L3	CO2
		Module–3			
Q.5	a	Derive the EMF equation of dc generator	6	L2	CO3

	b	What are the different types of dc generators?	7	L1	CO3
	c	A 4-pole lap connected dc generator has 600 armature conductors and runs at 1200 rpm. The generator has total flux of 0.24 Wb. Calculate emf induced. Find speed at which it should be drivento produce same emf when wave connected.	7	L3	CO3
		OR			
Q.6	a	Derive the torque equation of dc motor.	6	L2	CO3
	b	Explain the various characteristics of dc shunt motor with equivalent circuit diagram.	7	L2	CO3
	c	A 120 V dc shunt motor has a armature resistance of 0.2Ωand shunt field resistance of 50 Ω. It runs at 1800 rpm, when it takes load current of 40 A. Find speed of motor when it is operating at half the full load with load terminal voltage remaining the same.	7	L3	CO3
		Module–4			
Q.7	a	What is transformer? Explain its principle of operation and types.	6	L2	CO4
	b	Explain the various losses in transformer.	7	L1	CO4
	c	A single phase 1000 VA, 440/220 V, 50 Hz transformer while operating on full-load at a power factor of 0.8 lagging has copper losses of 150 W and iron losses of 80 W. Calculate its full-load and half full-load efficiency.	7	L3	CO4
		OR			
Q.8	a	Explain the concept of rotating magnetic field.	6	L2	CO4
	b	Explain the slip-ring rotor three phase induction motor.	7	L2	CO4
	c	A three phase, 4-pole induction motor supplied with 440 V, 50 Hz source runs at 1400 rpm. Find the synchronous speed, slip and frequency of rotor EMF.	7	L3	CO4
		Module–5			
Q.9	a	Explain the EV and its components with block diagram.	6	L2	CO5
	b	Explain permanent magnet synchronous machine.	7	L2	CO5
	c	Explain the different types of domestic wirings	7	L2	CO5
		OR			
Q.10	a	Explain fuse. What are its merits and demerits?	6	L1	CO5
	b	Describe the working principle of MCB with its merits and demerits.	7	L2	CO5
	c	What is electric shock? Mention the precautions to avoid it.	7	L1	CO5

*****