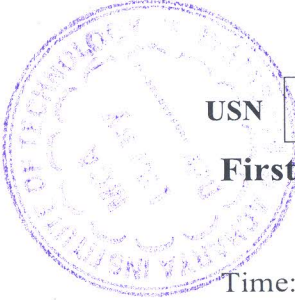


MAKE-UP EXAM



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BEEE103/203

First/Second Semester B.E./B.Tech. Degree Examination, Nov./Dec.2023 Elements of Electrical Engineering

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	Derive the expression for energy stored in inductor.	6	L3	CO1
	b.	State Fleming's right hand rule and Fleming's left hand rule.	6	L1	CO1
	c.	A circuit consists of 2 parallel resistors having resistance 20Ω and 30Ω respectively, connected in series with a 15Ω resistor. If the current through 30Ω resistor is $1.2A$. Find the: i) Currents in 20Ω and 15Ω resistors. ii) The voltage across 15Ω resistors and 20Ω resistor. iii) The voltage across the whole circuit. iv) The total power consumed in the circuit.	8	L3	CO1
OR					
Q.2	a.	State and explain Faraday's laws of electro magnetic induction.	6	L2	CO1
	b.	What is the potential difference between the point X and Y in the network shown? <div style="text-align: center;"> <p style="text-align: center;">Fig.Q.2(b)</p> </div>	8	L3	CO1
c.	State and explain Kirchoff's laws.		6	L2	CO1
Module – 2					
Q.3	a.	Obtain the expression for current through pure inductor if the voltage across it is $v = V_m \sin(\omega t)$.	7	L3	CO1
	b.	A series circuit with resistance of 10Ω , inductance $0.2H$ and capacitance $40\mu F$ is supplied with a $100V$ supply at $50Hz$. Find current, power and power factor.	6	L3	CO2
	c.	Define average value and also derive the respective expression.	7	L2	CO2
OR					
Q.4	a.	Show that the average power consumed in pure capacitance is 0. Draw the neat wave form for the voltage power and current.	7	L2	CO2
	b.	Voltage of $200V$ is applied to series circuit consisting of resistor, inductor and capacitor. The respective voltages across these components are $170V$, $150V$ and $100V$ and the current is $4A$. Find power factor, resistance and impedance, inductive and capacitive reactance.	6	L3	CO2
	c.	Two impedances $Z_1 = (6 - j8)\Omega$ and $Z_2 = (16 + j12)\Omega$ are connected in parallel. If the total current of the combination is $20 + j10A$. Find voltage across the combination and currents in the two branches.	7	L3	CO2
1 of 2					

Module – 3

Q.5	a.	Establish the relationship between phase and line value of voltage and current in 3 phase, delta connected circuit. Show the phasor diagram neatly.	7	L3	CO2
	b.	Three similar coils having resistance of 10Ω and reactance of 8Ω are connected in star across 400V, 3 phase supply determine i) current ii) total power iii) readings of each two wattmeter connected to measure power.	7	L3	CO2
	c.	A balanced star connected load of $8 + j6\Omega$ per phase is connected to 3 phase 230V supply. Find the line current, power factor, power reactive volt ampere and volt ampere.	6	L3	CO2

OR

Q.6	a.	What are the advantages of three phase system over single phase system?	6	L2	CO2
	b.	Prove that two wattmeters are sufficient to measure 3ϕ power.	7	L3	CO2
	c.	A three phase load of three equal impedance connected in delta across a balanced 400V supply takes a line current of 10A at a power factor of 0.7 lagging calculate i) The phase current ii) The total current iii) The total reactive volt ampere.	7	L3	CO2

Module – 4

Q.7	a.	Write the circuit diagram and switching table for 2 way and 3 way control of lamp.	6	L2	CO5
	b.	Explain the construction of Kelvin's double bridge.	7	L2	CO4
	c.	Explain the construction and working of megger.	7	L2	CO4

OR

Q.8	a.	Explain the construction of Maxwell's bridge and derive the expression for unknown inductance.	7	L2	CO4
	b.	Explain the types of wiring.	7	L2	CO4
	c.	Mention the difference between current transformer and potential transformer.	6	L2	CO4

Module – 5

Q.9	a.	Explain the necessity and the operation of earth leakage circuit breaker.	7	L2	CO5
	b.	What is earthing? With a neat diagram explain pipe earthing.	7	L2	CO5
	c.	Write a short note on necessity of earthing and precautions to be taken to prevent electric shock.	6	L2	CO5

OR

Q.10	a.	What are the desirable characteristics of tariff and explain two port tariff?	7	L2	CO5
	b.	Write a short note on fuse and MCB.	7	L2	CO5
	c.	With a neat circuit diagram explain the operation of RCCB.	6	L2	CO5
