

MAKE-UP EXAM

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BESCK104B/BESCKB104

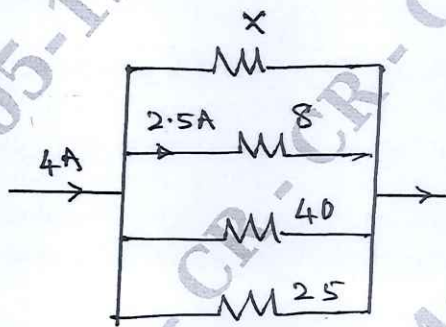
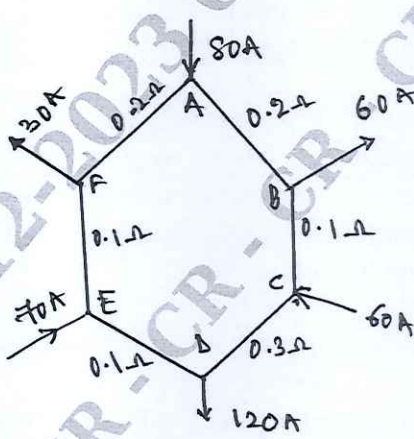
First Semester B.E./B.Tech Degree Examination, Nov./Dec. 2023

Introduction to 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.	What are conventional and non conventional energy resources?	6	L1	CO1
	b.	State and explain Kirchoff's laws.	6	L2	CO1
	c.	For the network of single parallel circuit shown in Fig.Q1(c) find : i) Current in all the resistors ii) Value of unknown resistance 'X'.	8	L3	CO1
 <p style="text-align: center;">Fig.Q1(c)</p>					
OR					
Q.2	a.	What are the different methods of electrical power generation? Explain with a neat block diagram, nuclear power generation method.	7	L1	CO1
	b.	What is Ohm's Law? What are its limitations?	5	L1	CO1
	c.	Find the current flowing in each branch for the network shown in Fig.Q2(c).	8	L3	CO1
 <p style="text-align: center;">Fig.Q2(c)</p>					
Module – 2					
Q.3	a.	Explain the following terms : i) Time period ii) Frequency iii) Amplitude with a neat wave form.	6	L1	CO2
	b.	Obtain an expression for R.M.S value in terms of maximum value of an alternating quantity.	6	L2	CO2
	c.	A resistor of 6Ω is connected in series with an inductor of inductance 25.46mH across a 220V, 50Hz AC supply find : i) Impedance ii) Power factor iii) Real and reactive powers.	8	L3	CO2

OR

Q.4	a.	What are the advantages of three phase over single phase system.	6	L2	CO3
	b.	Obtain relationship between line and phase voltages in a star connected system.	6	L2	CO2
	c.	Given $V = 200 \sin 377t$ volts and $i = 8 \sin (377t - 30^\circ)$ for an AC circuit. Find : i) power factor ii) true power iii) real and reactive power.	8	L2	CO3

Module – 3

Q.5	a.	Explain different parts of a DC generator.	6	L2	CO2
	b.	With visual notations obtain torque equation of a DC motor.	6	L2	CO2
	c.	A 6-pole wave connected DC generator has a total flux of 150 MWb. If it runs at a speed of 1000 rpm, find the emf generated? At what speed should it be driven to generate an emf of 300V if is lap connected. Take armature conductors to be 1200.	8	L3	CO3

OR

Q.6	a.	Obtain an expression for emf generated in a DC generator.	6	L2	CO2
	b.	Explain why? i) A dc series motor should not be started without load on it. ii) A shunt motor is called a constant speed motor.	6	L2	CO2
	c.	A 500V shunt motor having 4 poles and wave connected winding with 492 arm conductors takes a full load current of 20A. The flux/pole is 0.05wb, arm and shunt field resistances are 0.1Ω and 250Ω respectively. Find the speed and developed torque.	8	L3	CO3

Module – 4

Q.7	a.	With usual notations obtain emf equation of a transformer.	6	L2	CO2
	b.	Explain the concept of rotating magnetic field.	6	L2	CO2
	c.	A 4-pole, 3-phase, induction motor operates from a supply whose frequency is 50Hz. Calculate : i) The speed at which magnetic field rotates ii) Motor speed at a slip of 4% iii) Frequency of rotor current when slip is 3% iv) The frequency of rotor currents at stand still.	8	L3	CO3

OR

Q.8	a.	Explain different losses that occur in a transformer.	6	L2	CO4
	b.	Differentiate between slip ring and squirrel cage rotors.	6	L2	CO4
	c.	A single phase transformer has 1000 turns on its primary winding and 400 turns on secondary winding. AC supply if 1250V, 50Hz is supplied to primary with secondary winding open. Find : i) Secondary emf induced ii) Max value of flux density if the effective cross sectional area is 60cm^2 .	8	L3	CO4

Module – 5

Q.9	a.	Explain two way and three control of a load with neat wiring diagram.	6	L2	CO5
	b.	What is the unit of energy consumed? Explain two part tariff system.	8	L2	CO5
	c.	What is earthing? Explain any one type of earthing with a neat diagram.	6	L2	CO5

OR

Q.10	a.	What are the precautions to be taken to avoid electric shock.	6	L2	CO5
	b.	Differentiate between fuse and miniature circuit breaker.	8	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).	6	L3	CO5