

MAKE-UP EXAM



BESCK204B/BESCKB204

Second 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.	With block diagram, explain hydel power generation.	6	L1	CO1
	b.	State and explain Ohm's law with its limitations.	6	L1	CO1
	c.	Find the current in the various branches of the given network shown in Fig. Q1 (c).	8	L3	CO1
<p style="text-align: center;">Fig. Q1 (c)</p>					
OR					
Q.2	a.	Write the difference between conventional and non-conventional sources.	6	L1	CO1
	b.	State and explain Kirchoff's current law and voltage law with example.	6	L1	CO1
	c.	The total power consumed by the network is 16 watts. Find the value of R and the total current as shown in Fig. Q2 (c).	8	L3	CO1
<p style="text-align: center;">Fig. Q2 (c)</p>					
Module – 2					
Q.3	a.	Define the following by referring a sine wave : (i) Amplitude (ii) Cycle (iii) Frequency (iv) RMS value (v) Form factor (vi) Peak factor	6	L1	CO2

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	b.	Show that the current through pure Inductive circuit lags the applied voltage by 90° and average power consumed is zero. Draw the wave shapes of current, voltage and power.	6	L2	CO2
	c.	A circuit consists of a resistance of 20Ω and inductance of 0.054 connected in series. A supply of 230 V and 50 Hz is applied across the circuit. Find the current, power factor and power consumed by the circuit.	8	L3	CO2

OR

Q.4	a.	Derive an equation for the power consumed by an R-C series circuit. Draw the waveforms of voltage, current and power.	6	L2	CO2
	b.	What are the advantages of three phase system over single phase system?	6	L2	CO3
	c.	A circuit consist resistance of 10Ω , inductance of 16 mH and a capacitance of $150 \mu\text{F}$ connected in series. A supply voltage of 100 V at 50 Hz is given to the circuit. Find the current, power factor and power consumed by the circuit.	8	L3	CO3

Module – 3

Q.5	a.	With a neat sketch, explain the construction of the various parts of a D.C generator and the purpose they save.	8	L2	CO3
	b.	A 30 kW , 300 V DC shunt generator has armature and field resistance of 0.05Ω and 100Ω respectively. Calculate the total power developed by the armature when it delivers full output power.	8	L3	CO3
	c.	With usual notations derive an emf equation of DC generator.	4	L2	CO3

OR

Q.6	a.	Derive an expression of armature torque developed in a DC motor.	8	L2	CO3
	b.	A 4 pole DC shunt motor takes 22.5 A from 250 V supply. If armature resistance and shunt field resistance is 0.5Ω and 125Ω respectively. The armature is wave wound with 300 conductors if the flux per pole is 0.02 wb . Calculate the speed, torque developed and power developed.	8	L3	CO3
	c.	What is the significance of back emf of a D.C. motor?	4	L3	CO3

Module – 4

Q.7	a.	Derive the EMF equation of a transformer.	6	L2	CO3
	b.	Explain the various losses in a transformer and how they are minimized.	8	L2	CO3
	c.	A transformer is rated at 200 KVA at full load its copper losses is 1800 W and its iron losses is 750 W . Calculate (i) The efficiency at full load 0.9 P.F. (ii) The efficiency at half load 0.8 PF (iii) The efficiency at $\frac{1}{4}$ load 0.6 P.F.	6	L3	CO3

OR

Q.8	a.	Show that a rotating magnetic field is produced when a three phase balance supply is given to the stator winding of a $3 \phi \text{ IM}$.	8	L3	CO2
	b.	Write the difference between squirrel cage and slip ring induction motor.	6	L2	CO2
	c.	A 6 pole induction motor (IM) is supplied by a 10 pole alternator which is running at 600 rpm . If the motor is running at 970 rpm . Calculate the percentage slip.	6	L3	CO2

Module – 5					
Q.9	a.	With a neat circuit diagram and switching table, explain two way and three way control of lamp.	8	L2	CO5
	b.	With diagram, explain the working of MCB.	6	L2	CO5
	c.	What is Earthing? With neat diagram, explain the plate Earthing.	6	L2	CO5
OR					
Q.10	a.	Define “Unit” used for consumption of electrical energy and explain the two part tariff with its advantages and disadvantages.	8	L1	CO5
	b.	What is electric shock? Give the list of preventive measures against the shock.	6	L1	CO5
	c.	List out the power rating of household appliances including, (i) Air conditioners 1 ton – 1 No. (ii) Computer – 1 No. (iii) Fridge – 1 No. (iv) DVD player – 1 No. (v) Ceiling fan – 1 No. Find the total power consumed.	6	L1	CO5
