S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT -1 **INTRODUCTION TO ELECTRICAL ENGINEERING AND NETWORK ANALYSIS**		
1	**State** Kirchhoff's voltage law and Kirchhoff's current law?	Remember	2
2	**Explain** ideal voltage and current source?	Understand	1
3	**Discuss** the applications of both series and parallel combination?	Understand	2
4	**Discuss** resistor, capacitor, and inductor with relevant expression?	Understand	2
5	**Explain** the equations for resistors in equivalent delta. If the resistors Ra, Rb and Rc are connected electrically in star?	Evaluate	2
6	**State** Ohm's law?	Evaluate	1
7	**State** Superposition Theorem?	Remember	3
8	**State** Thevinins Theorem?	Remember	3
9	**State** Maximum power transfer theorem?	Remember	3
10	**Explain** difference between series and parallel resistive circuit ?	Understand	2
	UNIT – II **ALTERNATING QUANTITIES**		
1	**Define** RMS Value?	Remember	7
2	**State** advantages of alternating quantities?	Understand	7
3	**Define** form factor?	Remember	7

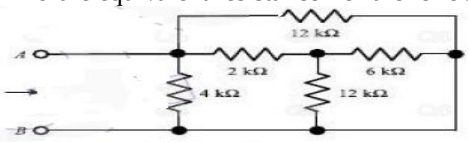
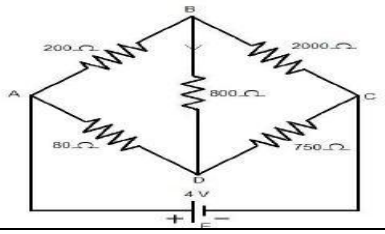
S. No	Question	Blooms Taxonomy Level	Course Outcome
4	**Define** peak factor?	Remember	7
5	**Explain** significance of J factor?	Understand	7
6	**Define** average Value?	Remember	7
7	**Explain** polar form and rectangular form?	Understand	7
8	**Differentiate** ac and dc quantities?	Understand	7
9	**Define** time period and frequency?	Remember	7
10	**Define** cycle and waveform?	Remember	7
	UNIT – III **TRANSFORMERS**		
1	**Define** transformation ratio?	Remember	5
2	**Explain** the purpose of laminating the core in a transformer?	Understand	5
3	**Explain** the emf equation of a transformer and define each term. ?	Remember	5
4	**Explain** does transformer draw any current when secondary is open? Why?	Understand	5
5	**Explain** mutual induction principle?	Understand	5
6	**Explain** why the transformer measured in KVA?	Understand	5
7	**Discuss** what are the parts are in parts in transformer?	Understand	5
8	**Explain** the equivalent circuit diagram of transformer?	Understand	5
9	**Define** voltage regulation of a transformer?	Remember	5
10	**Explain** difference between core and shell type transformers?	Understand	5
	UNIT – IV **DC AND AC MACHINES**		
1	**State** Fleming's Right Hand Rule?	Remember	5
2	**State** Fleming's Left Hand Rule?	Remember	5
3	**Write** down the emf equation of a dc generator?	Understand	5
4	**Write** down the torque equation of a D.C motor?	Understand	5
5	**State** the function of commutator and brushes?	Remember	5
6	**Define** slip in induction motor?	Remember	6
7	**Write** expression for rotor current frequency?	Understand	6
8	**What** is principle operation of 3-phase induction motor?	Understand	6
9	**Explain** the slip-torque characteristics of 3-phase induction motor?	Understand	6
10	**State** two types of induction motors?	Understand	6
	UNIT –V **BASIC INSTRUMENTS**		
1	**What** are the types of measuring instruments?	Understand	4
2	**Write** a short notes on moving iron instruments?	Understand	4
3	**Write** a short notes on moving iron instruments with attraction type?	Understand	4
4	**Write** a short notes on moving iron instruments with repulsion type?	Understand	4
5	**Define** i. air friction damping ii. fluid friction damping iii. eddy current damping ?	Remember	4
6	**Write** short notes on spring control mechanism?	Understand	4
7	**Write** short notes on gravity control?	Understand	4
8	**What** is mean by instrument? Different types of instrument	Understand	4
9	**Write** different types of torques?	Understand	4
10	**Write** short notes on controlling torque?	Understand	4

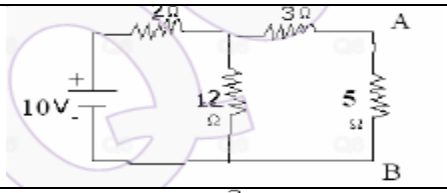
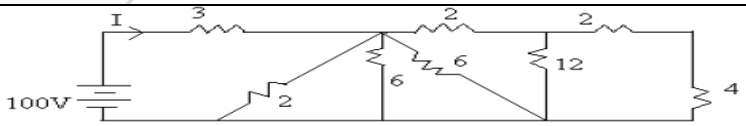
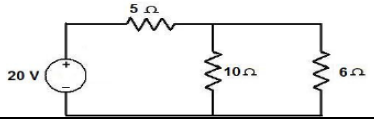
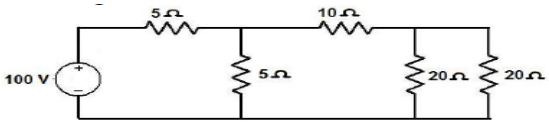
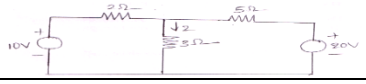
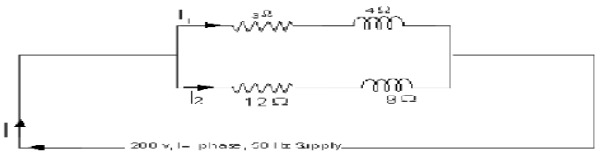
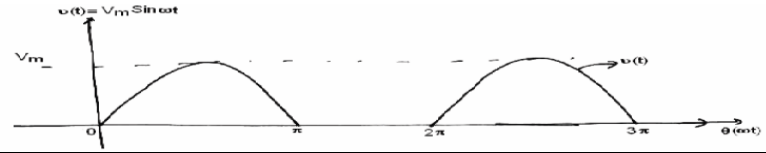
PART – B (LONG ANSWER QUESTIONS)

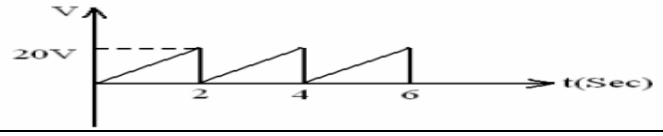
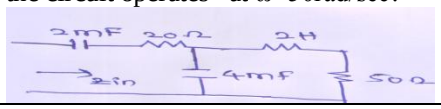
S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT -1 **INTRODUCTION TO ELECTRICAL ENGINEERING AND NETWORK ANALYSIS**		
1	**Explain** two capacitors are connected in series then $C_{eq} = (C_1*C_2)/(C_1+C_2)$?	Evaluate	1
2	**Explain** derivation of star-delta conversion equations?	Evaluate	2
3	**Explain** derivation of delta-star conversion equations?	Evaluate	2
4	**Explain** in detail the volt-ampere relationship of R, L and C elements with neat diagrams?	Understand	1
5	**Explain** about series and parallel networks of resistor?	Understand	1
6	**Explain** about series and parallel networks of inductor?	Understand	1
7	**Explain** classification of network elements?	Understand	1
8	**Explain** superposition theorem?	Remember	3
9	**Explain** Thevinin's theorem?	Remember	3
10	**Derive** the condition for maximum power transfer theorem?	Evaluate	3
	UNIT –II **ALTERNATING QUANTITIES**		
1	**Explain** following terms: i) Impedance ii) admittance iii) susceptance iv) conductance v)Power factor ?	Remember	7
2	**Write** about series RL circuit?	Understand	7
3	**Write** about series RC circuit?	Understand	7
4	**Explain** behavior of RLC Series circuit ?	Understand	7
5	**Explain** i) rectangular form ii) polar form ?	Understand	7
6	**Explain** significance of J-Operator?	Understand	7
7	**Write** equations for RMS value, average value, form factor and peak factor?	Understand	7
8	**Discuss** what are the advantages of AC quantities?	Understand	7
9	**Explain** conversion from rectangular form to polar form?	Understand	7
10	**Explain** conversion from polar form to rectangular form?	Understand	7
	UNIT –III **TRANSFORMERS**		
1	**Describe** the construction details of transformer?	Understand	5
2	**Explain** the principle of operation of transformer?	Understand	5
3	**Explain** the OC test of a single phase transformer?	Understand	5
4	**Explain** the losses in a Transformer?	Understand	5
5	**Obtain** the condition for maximum efficiency of a transformer?	Evaluate	5
6	**Obtain** the equivalent circuit of a single phase transformer?	Evaluate	5
7	**Explain** the SC test of a single phase transformer?	Understand	5
8	**Explain** the determination of deducing equivalent circuit parameters?	Understand	5
9	**Explain** the ON load condition of a transformer?	Understand	5
10	**Explain** the NO load condition of a transformer?	Understand	5
	UNIT –IV **DC AND AC MACHINES**		
1	**Explain** the classification of DC generator?	Understand	5
2	**Derive** the equation for induced EMF of a DC generator?	Evaluate	5
3	**Derive** the torque equation of DC motor?	Evaluate	5
4	**Explain** the principle and construction of a 3 phase induction motor?	Understand	6

S. No	Question	Blooms Taxonomy Level	Course Outcome
5	**Derive** the expression for rotor frequency?	Evaluate	6
6	**Explain** why does an induction motor never runs at Synchronous speed?	Understand	6
7	**Obtain** the condition for maximum running torque of an induction motor?	Understand	6
8	**Explain** the classification of DC Motor and explain?	Understand	6
9	**Explain** the significance of back EMF in a DC motor?	Understand	6
10	**Explain** the load characteristics of shunt, series and compound generators?	Understand	6
	UNIT –V **BASIC INSTRUMENTS**		
1	**Explain** working principle of permanent magnet moving coil instrument?	Understand	4
2	**Explain** working principle of moving iron repulsion type instrument?	Understand	4
3	**Explain** working principle of moving iron attraction type instrument?	Understand	4
4	**Explain** working of different types of torques produced in indicating instruments?	Understand	4
5	**Explain** i) Deflecting torque ii) Controlling torque iii) Damping torque?	Understand	4
6	**Mention** advantages and disadvantages of MIinstruments?	Understand	4
7	**Explain** the essential requirements of instruments?	Understand	4
8	**Classify** of electrical instruments?		4
9	**Discuss** advantages and disadvantages of MI instruments?	Understand	4
10	**Explain** the significance of controlling torque and damping torque relevant to the operation of indicating instruments?	Understand	4

PART – C (ANALYTICAL QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT -1 **INTRODUCTION TO ELECTRICAL ENGINEERING AND NETWORK ANALYSIS**		
1	**Find** the equivalent resistance for the following circuit? 	Apply	2
2	**Determine** the current through 800 ohm resistor in the network shown in figure 	Apply	2
3	If current flowing through a coil changes at the rate of 2amps/sec and the voltage induced is 20v. **Find** the inductance value?	Apply	1
4	By using Thevinin's theorem **Determine** the current through 5 ohm resistor?	Apply	3

S. No	Question	Blooms Taxonomy Level	Course Outcome
			
5	 **Find** current I in the above circuit?	Apply	2
6	**Find** the power consumed by each resistor? 	Apply	1
7	**Find** the current in each resistor ? 	Apply	3
8	**Calculate** how to combine four 100 ohm resistors to obtain an equivalent resistance of a. 25 ohm, b. 60 ohm, c. 40 ohms?	Apply	2
9	**Calculate** the current 'I' shown in figure using super position theorem? 	Apply	2
10	If 3 capacitors of values 2mF, 4mF, 5mF are connected in parallel. **Calculate** the effective capacitance?	Apply	2
	UNIT – II **ALTERNATING QUANTITIES**		
1	A circuit consists of a resistance of 15ohm, a capacitance of 200 micro Farad and inductor of 0.05H all in series. If supply of 230V, 50Hz is applied to the ends of circuit. **Calculate** i) Current in the coil ii) Potential difference across each element?	Apply	7
2	**Write** about series RC circuit?	Understand	7
3	**Solve** the following parallel circuit and find out current in each branch and total current as shown in figure 	Apply	7
4	**Calculate** the RMS, and average values of an alternating quantity given by $\upsilon = 20\cos(314t)$?	Apply	7
5	**Find** form facto and peak factor? 	Apply	7

S. No	Question	Blooms Taxonomy Level	Course Outcome
6	**Determine** the average and effective values of saw-tooth waveform as shown in below figure 	Apply	7
7	Two impedances z1=20+j10 and Z2= 10-j30 are connected in parallel and this combination is connected in series with Z3=30+jx. **Find** the value of 'x' which will produce resonance?	Apply	7
8	**Convert** from rectangular to polar i) z=30+j60 ii) z=45+j50 ?	Apply	7
9	**Find** the input impedance of the circuit shown in figure(b) below .assume the circuit operates at ω=50rad/sec? 	Apply	7
10	**Find** the voltage across RL phase angle in series R-L circuit, with R = 100 ohms and L = 50mH and input voltage 10V, 100Hz ?	Apply	7
	UNIT – III **TRANSFORMERS**		
1	A 125 KVA transformer having primary voltage of 2000V at 50 Hz has 182 primary and 40 secondary turns. Neglecting losses, **calculate**: i) The full load primary and secondary currents. ii) The no-load secondary induced emf. iii) Maximum flux in the core.	Apply	5
2	Open Circuit and short circuit tests on a single phase transformer gave the following results. V0=200V, I0=0.7A, WO=20W ---------- test from primary side VS =10V, IS =10A, WS =40W ---------- test from primary side. **Determine** the equivalent circuit referred to primary side?	Apply	5
3	A transformer supplied a load of 32A at 415V. If the primary voltage is 3320V, **find** the following: (a) Secondary volt ampere (b) Primary current (c) Primary volt ampere. Neglect losses and magnetizing current.	Apply	5
4	A single phase transformer has 50 primary and 1000 secondary turns. Net cross sectional area of the core is 500 cm2. If the primary winding is connected to 50 Hz supply at 400 V, **Calculate** the value of Maximum flux density on core and the emf induced in the secondary?	Apply	5
5	A transformer with 40 turns on the high voltage winding is used to step down the voltage from 240V to 120V. **Find** the number of turns in the low voltage winding. Open circuit and short circuit tests on a 5 KVA, 220/400V, 50 Hz, single phase transformer gave the following results: OC Test: 220V, 2A, 100W (lv side) SC Test: 40V, 11.4A, 200W (hv side) Obtain the equivalent circuit?	Apply	5
6	A 3300/230V, 50Hz, 1-phase transformer is to be work at maximum flux density of 1.2 wb/m2 in the core is 150 cm^2. **Calculate** suitable value of primary and secondary turns?	Apply	5
7	A single phase 50Hz transformer has 80 turns on the primary winding and 280 in the secondary winding. The voltage applied across the primary winding is 240 V. **Calculate** (i) the maximum flux density in the core (ii) induced emf in the secondary winding. The net cross sectional area of the core can be taken 200cm^2?	Apply	5

S. No	Question	Blooms Taxonomy Level	Course Outcome
8	A 15kVA 2400-240-V, 60 Hz transformer has a magnetic core of 50-cm2 cross section and a mean length of 66.7 cm. The application of 2400 V causes magnetic field intensity of 450 AT/m (RMS) and a maximum flux density of 1.5 T. **Determine** i. The turn's ratio ii. The number of turns in each winding iii. The magnetizing current	Apply	5
9	The emf per turn of a 1- φ, 2200/220 V, 50 Hz transformer is approximately 12V. **Calculate** i) The number of primary and secondary turns, and ii) The net cross-sectional area of core for a maximum flux density of 1.5 T.	Apply	5
10	A 440/110 v transformer has a primary resistance of 0.03 ohms and secondary resistance of 0.02 ohms if iron losses at normal input is 150 watts. **Determine** the secondary current at which maximum efficiency will occur and the value of this maximum efficiency at a unity power factor load?	Apply	5
	UNIT –IV **DC AND AC MACHINES**		
1	**Calculate** the e.m.f by 4 pole wave wound generator having 65 slots with 12 conductors per slot when driven at 1200 rpm the flux per pole is 0.02 wb?	Apply	5
2	A dynamo has a rated armature current at 250 amps what is the current per path of the armature if the armature winding is lap or wave wound? The machine has 12 poles.	Apply	5
3	A 6 pole lap wound dc generator has 600 conductors on its armature flux per pole is 0.02 wb. **Calculate** i. The speed at which the generator must be run to generate 300v. ii. What would be the speed if the generated were wave wound?	Apply	5
4	A 230 volts dc shunt motor takes 51 A at full load. Resistances of armature and field windings are 0.1ohm and 230 ohms respectively. **Determine** i. armature current ii. field current iii. back emf developed at full load?	Apply	5
5	In case of an 8-pole induction motor the supply frequency was 50 Hz and the shaft speed was735 rpm. **Determine** i) Synchronous speed ii) Slip speed per unit slip iii) Percentage slip?	Apply	6
6	**Calculate** the value of torque established by the armature of a 4pole motor having 774 conductors, two paths in parallel,24 m wb flux per pole , when the total armature current is 50 amps.	Apply	5
7	A 6 pole DC Long shunt generator having an armature ,series and shunt field resistances of 0.25 Ω ,0.5 and 100 Ω respectively delivers a load current of 35 Amps at a voltage of 200V.Take 2Volt as total brush drop. **Calculate** the induced EMF?	Apply	5
8	**Calculate** the induced EMF for a 6 pole DC Shunt generator having an armature and field Resistances of 0.25 Ω and 50 Ω respectively delivers a load current of 25 Amps at a voltage of 220V . Take 1Volt as total brush drop	Apply	5
9	A 6 – pole dc shunt generator with a wave – wound armature has 960 conductors. It runs at a speed of 500 rpm. A load of 20Ω is connected to the generator at a terminal voltage of 240V.The armature and field resistances are 0.3Ω and 240Ω respectively. **Find** the armature current, the induced emf and flux per pole?	Apply	5
10	A 6-pole, 50Hz squirrel cage induction motor runs on load at a shaft speed of 970 rpm. **Calculate** i. Percentage slip	Apply	6

S. No	Question	Blooms Taxonomy Level	Course Outcome
	ii. The frequency of the induced current in the rotor?		
	UNIT –V **BASIC INSTRUMENTS**		
1	A moving-coil instrument gives a full scale deflection. When the current is 40 mA and its resistance is 25. **Calculate** the value of the shunt to be connected in parallel with the meter to enable it to be used as an ammeter for measuring currents up to 50 A?	Apply	4
2	A moving-coil instrument having a resistance of 10 ohms, gives a full scale deflection. When the current is 8 mA. **Calculate** the value of the multiplier to be connected in series with the instrument so that it can be used as a voltmeter for measuring full scale deflection up to 100 V?	Apply	4
3	A moving-coil instrument gives full scale deflection. For a current of 10 mA. Neglecting the resistance of the instrument. **calculate** the approximate value of series resistance needed to enable the instrument to measure up to i. 20 V ii. 100V iii. 250 V?	Apply	4
4	A meter of resistance 50 ohms has a full scale deflection of 4 mA. **Determine** the value of shunt resistance required in order that full scale deflection should be (a) 15 mA (b) 20 A (c) 100 A?	Apply	4
5	A moving-coil instrument having a resistance of 20, gives a full scale deflection when the current is5 mA. **Calculate** the value of the multiplier to be connected in series with the instrument so that it can be used as a voltmeter for measuring full scale deflection up to 200 V?	Apply	4
6	A moving-coil instrument has a full scale deflection of 20 mA and a resistance of 25. **Calculate** the values of resistance required to enable the instrument to be used (a) as a 0–10A ammeter and (b) as a 0–100 V voltmeter. State the mode of resistance connection in each case?	Apply	4
7	A PMMC instrument has a coil dimensions 15mm*12mm. the flux density in the air gap is 1.8 mWb/m*m and the spring constant 0.14micro N-m/rad. **Determine** the number of turns required to produce an angular deflection of 90degrees when a current of 5mA is flowing through the coil?	Apply	4
8	A PMMC instrument has a coil dimensions 18mm*16mm. the flux density in the air gap is 1.5 mWb/m*m and the spring constant 0.18micro N-m/rad. **Determine** the number of turns required to produce an angular deflection of 90degrees when a current of 3mA is flowing through the coil?	Apply	4