

University of Mumbai
Examinations Summer 2022

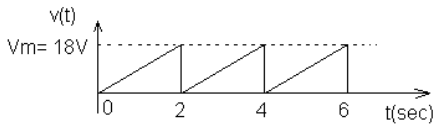
Time: 2 hour 30 minutes

Max. Marks: 80

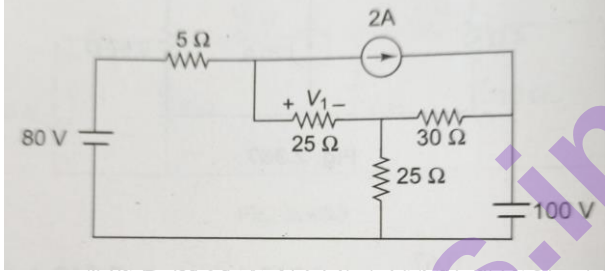
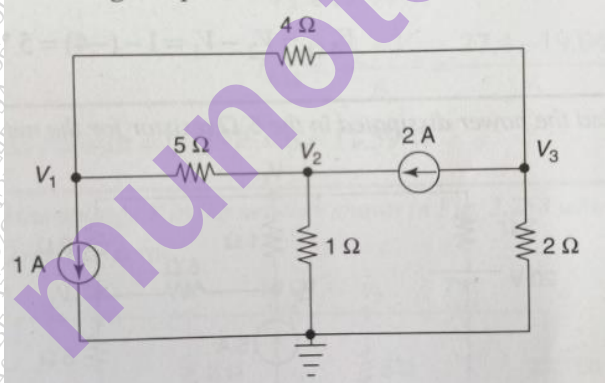
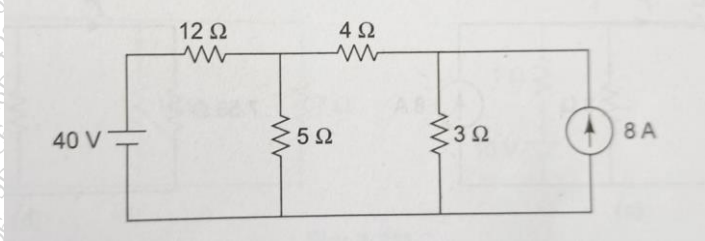
Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Internal Resistance of an ideal current source is
Option A:	Infinity
Option B:	Zero
Option C:	Maximum
Option D:	Minimum
2.	In a circuit, an internal resistance of 10 ohm is connected in series with a load resistance. A dc voltage of 100V is applied to it. At what value of load resistance, maximum power will be transferred to the load.
Option A:	Infinity ohm
Option B:	10 ohm
Option C:	20 ohm
Option D:	Zero ohm
3.	Form factor is a ratio of
Option A:	Rms value to maximum value
Option B:	Maximum value to rms value
Option C:	Maximum value to Average value
Option D:	Rms value to Average Value.
4.	Rms value of a pure sine voltage wave is
Option A:	$V_m/2$
Option B:	$2V_m$
Option C:	$V_m/\sqrt{2}$
Option D:	V_m/π
5.	A voltage of 200<50 volts is applied to an impedance. Current flowing through the circuit was 10<20 ampere. What will be the impedance of the circuit.
Option A:	20<70
Option B:	20<30
Option C:	2000<30
Option D:	2000<70
6.	Power absorbed by purely capacitive circuit is
Option A:	Zero
Option B:	Infinity
Option C:	More than apparent power
Option D:	Less than apparent power
7.	Condition for series resonance is
Option A:	$X_L = X_C/2$
Option B:	$X_L = X_C$
Option C:	$X_L = Z_L$
Option D:	$Z_L = R$

8.	Current at parallel resonance is
Option A:	Maximum
Option B:	V/R
Option C:	Minimum
Option D:	Zero
9.	Which Motor is not self-starting
Option A:	Dc shunt Motor
Option B:	Dc series Motor
Option C:	Single phase Induction motor
Option D:	Three phase induction motor
10.	In two wattmeter method reading of the two wattmeters are 300W and 500W. Calculate three phase reactive power in the circuit.
Option A:	282.84
Option B:	200
Option C:	222
Option D:	346.41

Q2	(20 Marks Each)
A	Solve any One 10 marks each
i.	A circuit consists of a pure resistor and a coil in series. Power dissipated in the resistor and in the coil are 1000W and 250W respectively. The voltage drops across the resistor and the coil are 200V and 300V respectively. Determine value of resistance, resistance and reactance of a coil, combined resistance and impedance of the coil and supply voltage.
ii.	Instantaneous voltages across each of four impedances connected in series are given below. Find the resultant applied voltage. $v_1 = 100 \sin \omega t$, $v_2 = 250 \cos \omega t$, $v_3 = 150 \sin(\omega t + \pi/6)$, $v_4 = 200 \sin(\omega t - \pi/4)$
B	Solve any One 10 marks each
i.	Three similar choke coils are connected in star to a three phase supply. If the line current is 15A, the total power consumed is 11KW and the voltampere input is 15KVA, find the line and phase voltages, the VAR input and the reactance and resistance of each coil.
ii.	Prove that two wattmeter method can measure the power in three phase star connected circuit.

Q3	(20 Marks Each)
A	Solve any One 10 marks each
i.	 Find V_{rms} of the wave.

ii.	A coil is connected across a 250V, 50 Hz supply takes a current of 10A at 0.8 lag pf. What will be the power taken by the coil. Now if the same coil is connected across 200V, 25Hz supply, what will be the power taken.
B	Solve any One 10 marks each
i.	A series RLC circuit is connected to 200V ac supply. The current drawn by the circuit is 20A at the resonance. The voltage drop across capacitor at resonance is 5000V. Find resistance and inductance if capacitance value is 4 μ F. Calculate resonant frequency.
ii.	Explain construction of three phase motor.

Q4	(20 Marks Each)
A	Solve any One 10 marks each
i.	 Find voltage across 25 ohm using mesh analysis.
ii.	Explain classification DC motor.
B	Solve any One 10 marks each
i.	 Find V1 and V2 by nodal analysis.
ii.	 Find current in 3 ohm by thevenin's theorem.