FE - Sem-I - Old - BEE

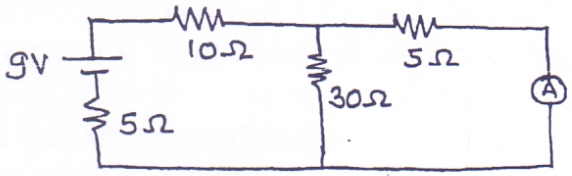
2015/16

QP Code : **28518**

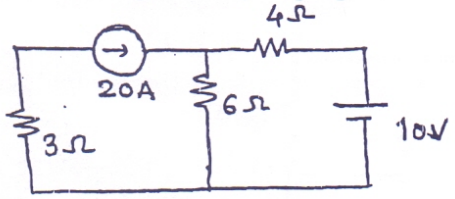
(3 Hours) [Total Marks : 100

N. B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** out of the remaining.

1. (a) Determine current drawn by the ammeter shown in figure 3



(b) Find current through 6Ω by superposition theorem 3



(c) A voltage of v 200 Sin(314t + 20°) is being applied to pure inductor of value 50mH. Find instantaneous wave equation of current through the circuit. 2

(d) A series resonant circuit has an impedance of 500Ω at resonant frequency. The cut off frequencies are 10KHz & 100Hz. Find inductance of the circuit. 3

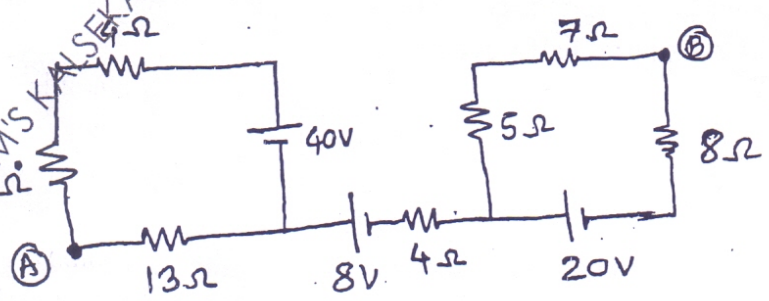
(e) Write voltage & current relationship between phase & line quantities in three phase star circuit. 2

(f) What are the losses in transformer. Explain any one type of loss. 3

(g) A three phase IM has 4 poles & runs at 1460 rpm. If frequency is 50Hz. Find slip. 2

(h) Define rectification efficiency. 2

2. (a) 6



Find voltage across point A & B.

[TURN OVER

(b) A resistor of 20Ω is in series with a capacitor of 50μF. A voltage of 200∠ 20°V is being applied to it. Find impedance of circuit, current and power in the circuit. 6

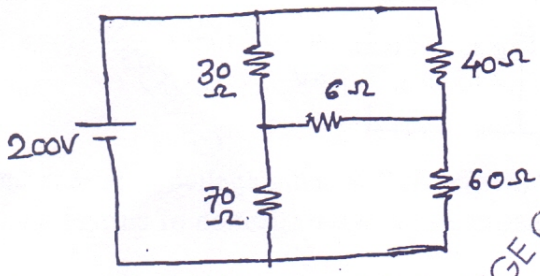
(c) Draw the phasor diagram of a transformer leading pf load. 8

3. (a) Three identical impedances are connected in star to a 400V, 50Hz supply. Each impedance has a resistance of 20Ω & inductance of 20mH in series. Find phase impedance, line & phase current & total power absorbed by the circuit. 8

(b) Explain short circuit test to find equivalent circuit parameters of a transformer. 4

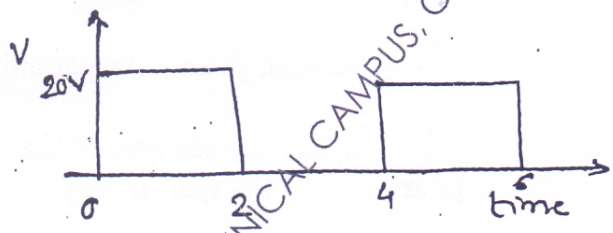
(c) Explain double field revolving theory in single phase induction motor. 8

4. (a) 7



Find current in 6Ω by thevenin's theorem.

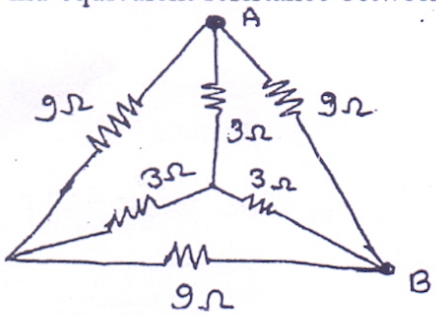
(b) Find average value of following waveform 4



(c) Comment on how readings of two wattmeter changes with change in power factor angle e.g. 0°, 60° to 90°, 90°, where wattmeter are connected to measure three phase power in a three phase circuit. 4

(d) Explain working of half wave rectifier 5

5. (a) Find equivalent resistance between A & B 7



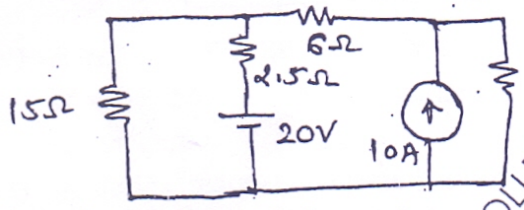
(b) In a RLC series circuit voltage across resistor, voltage across inductor & voltage across capacitor are 1V, 15V, 10V respectively. Find magnitude of supply voltage. 5

(c) A 10kVA, 450V/120V, 50 Hz, single phase transformer gave following results. 8

OC test	120V	4.2A	80w (HV open)
SC test	9.65V	22.2A	120w (LV shorted)

Find equivalent circuit constants referred to primary.

6. (a) Calculate power dissipated in 9Ω by superposition theorem. 7



(b) A series RLC circuit has resistance of 10Ω, inductance of 20mH & capacitance of 50μF. Find resonant frequency, quality factor and bandwidth. 7

(c) Prove that two wattmeter method can measure power in three phase star connected circuit. 6

7. (a) For $v = 200 \sin(314t - 20°)$. Find amplitude, frequency & phase angle of the wave. 2

(b) An impedance contains a resistance of 10Ω & inductance of 20mH in series. Find admittance & its components of circuit. 3

(c) Find all day efficiency of a 500 kVA transformer having full load cu loss is 4.5kw & iron loss is 3.5 kw. It s loaded during 24 hours as follows. 5

400kw	0.8pf	6 hours
300kw	0.75pf	10 hours
100kw	0.8pf	4 hours
0kw	-	4 hours

(d) Derive an expression for emf induced in DC motor 5

(e) Describe experimental setup to obtain input & output characteristics of CE configuration of BJT. 5
