22330

12425

03 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : **10**

a) Define lagging and leading.

b) Define power factor and state its formula.

c) Define quality factor of series resonance circuit.

d) State Kirchoff's voltage law.

e) Define node and branch.

f) State superposition theorem.

g) Write the equation for Y parameter.

2. Attempt any THREE of the following : **12**

a) What is power factor and state its significance. What is the condition for unity power factor.

b) Compare series and parallel resonance circuit.

c) Draw the star and delta connection. State conversion formula for any one.

d) State and explain Nortons theorem.

P.T.O.

Marks

3. Attempt any THREE of the following : **12**

a) Define and state equations for :

i) Active power

ii) Reactive power

b) Draw a R–L–L series circuit and phaser diagram. Also write equations for condition $V_L > V_C$.

c) Describe the meaning of term open circuit and short circuit with neat diagram.

d) State and explain Thevenin's theorem with suitable example.

4. Attempt any THREE of the following : **12**

a) A coil of resistance 10Ω and inductor 0.1 H is connected in series with a capacitor of 150 μF across 200V, 50 Hz. Supply Calculate.

i) Inductive reactance

ii) Capacitive reactance

iii) Impedance

iv) Current.

b) A single phase A.C. circuit containing resistor of 30Ω and inductor of 0.15 H are connected in parallel across 230V, 50 Hz supply.

Determine –

i) Admittance

ii) Current

iii) Power factor

iv) Power

c) If $Z_1 = 5 + j6$ and $Z_2 = 10 - j16$ are connected in parallel. Find the equivalent impedance of combination.

Marks

d) Write equivalent star resistances for the given delta network for Figure No. 1.

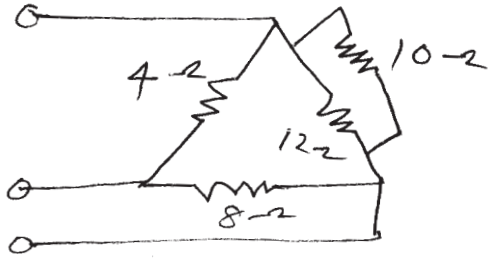

Fig. No. 1

e) Find the current in 4Ω, resistance using superposition theorem for the circuit shown in Figure No. 2.

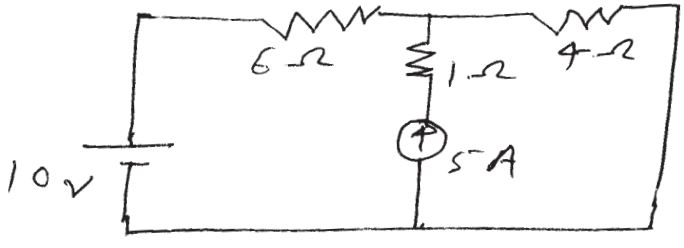

Fig. No. 2

5. Attempt any TWO of the following : **12**

a) Find the current I shown in Figure No. 3.

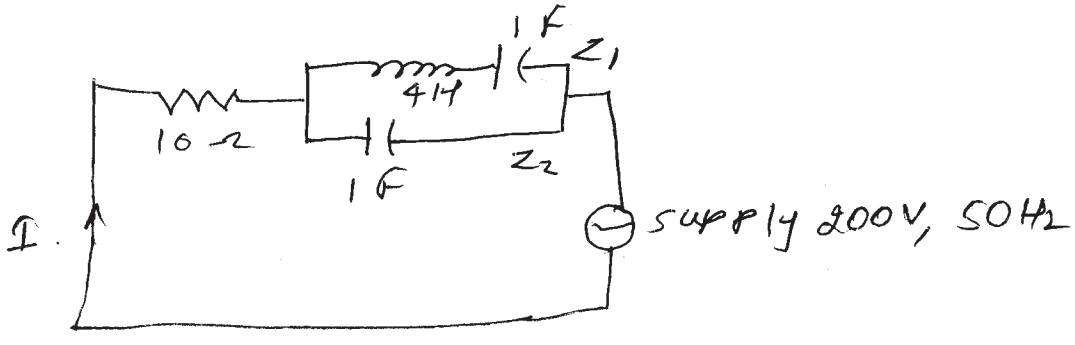

Fig. No. 3

Marks

b) Find the Thevenin's equivalent circuit for the circuit shown in Figure No. 4.

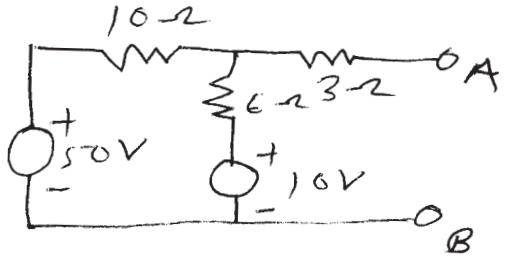

Fig. No. 4

c) Obtain the Y-parameters of network shown in Figure No. 5.

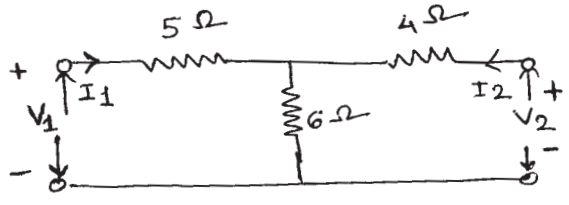

Fig. No. 5

6. Attempt any TWO of the following : **12**

a) Find the equivalent resistance between terminal A and B for a circuit shown in Figure No. 6.

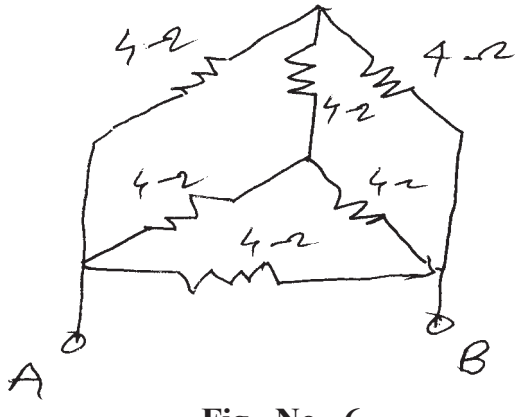

Fig. No. 6

Marks

b) Using Norton's theorem calculate the current in the load resistance of the circuit shown in Figure No. 7

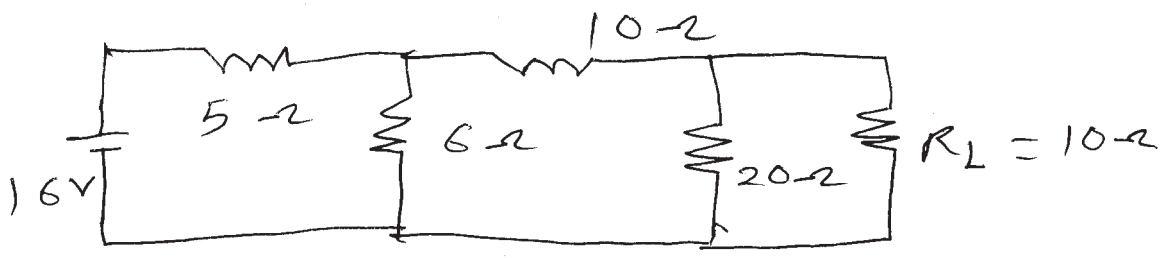

Fig. No. 7

c) Find the ABCD parameters for the network shown in Figure No. 8.

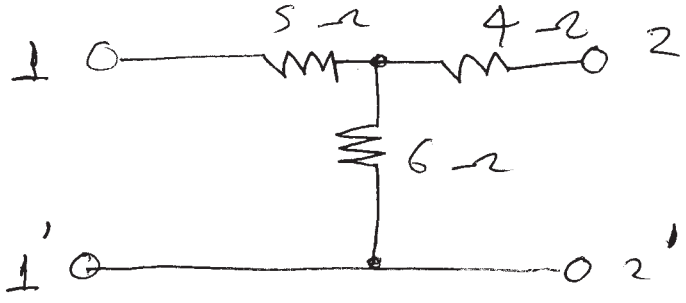

Fig. No. 8