22330

11920

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

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

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) 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 :

(i) Apparent power

(ii) Real power

b) Write equation of resultant impedance in R-L circuit.

c) State condition for resonance in R-L-C series circuit.

d) Draw -

(i) Practical voltage source

(ii) Ideal current source

e) Write formula for star to delta and delta to star transformation.

f) State maximum power transfer theorem.

g) Write equation of short circuit Y parameters.

Marks

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

a) For R-C series circuit draw

(i) Circuit diagram

(ii) Vector diagram

(iii) Waveform of voltage and current

b) Compare series and parallel resonance on the basis of

(i) Resonating frequency

(ii) Impedance

(iii) Current

(iv) Magnification

c) Explain the suitable example to convert a practical current source into equivalent voltage source.

d) Write the steps for finding the current through an element by Thevenin's theorem.

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

a) Explain the concept of initial and final conditions in switching circuits for elements R and L.

b) Derive an expression for resonant frequency of series RLC circuit.

c) Derive the expression for delta to star transformation.

d) State super position theorem. Write steps to find current in an element using super position theorem.

Marks

4. Attempt any THREE of the following: 12

a) A series combination of resistance 100 ohm and capacitance 50 µf is connected in series to a 230 V, 50 Hz supply. Calculate

(i) Capacitive reactance

(ii) Current

(iii) Power factor

(iv) Power consumed

b) Two unpedauces given by $Z_1 = 10 + j5$ and $Z_2 = 8 + j9$ are joined in parallel and connected across a voltage of $V = 200 + j0$. Calculate the circuit current and branch currents. Draw the vector diagram.

c) An a.c series circuit has resistance of 10 ohm inductance of 0.1 H and capacitance of 10 µf., Voltage applied to circuit is 200V. Find

(i) Resonant frequency

(ii) Current at resonance

(iii) Power at resonance

d) Use mesh analysis to calculate ammeter current in Fig. No. 1.

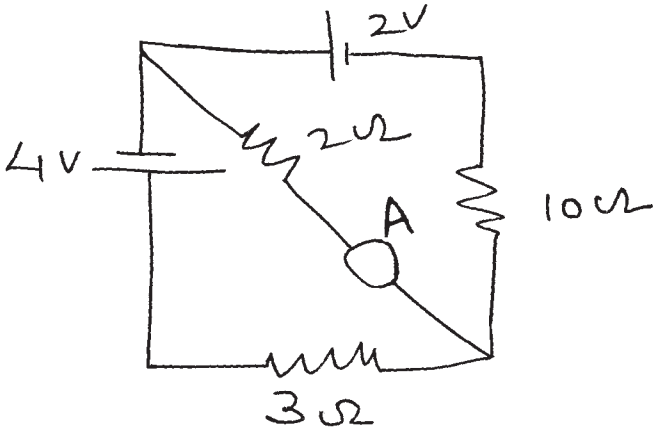

Fig. No. 1

Marks

e) Find the Norton equivalent resistance for the network shown in Fig.No. 2.

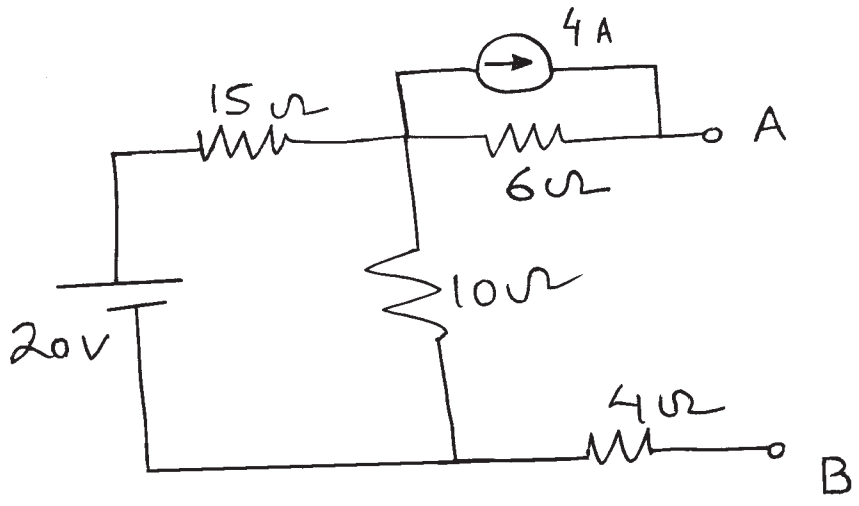

Fig. No. 2

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

a) A coil of resistance 20 ohm and inductance of 200 μH is in parallel with variable capacitor. This combination is in series with a resistance of 8000 ohm The voltage of the supply is 200 V and at a frequency of 10^6 Hz. Calculate

(i) Value of C to give resonance

(ii) The Q of the coil

(iii) Dynamic resistance of the circuit.

b) Apply superposition theorem to Fig.No. 3 for determining the current in 100 Ω resistance.

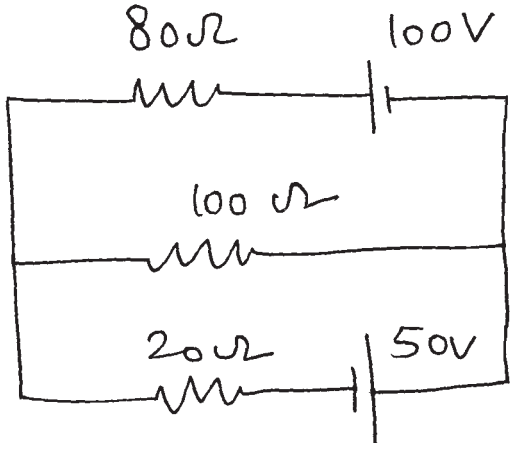

Fig. No. 3

Marks

c) Draw the two port network and determine the indicated parameters for the following configuration

(i) Cascade configuration (ABCD parameter)

(ii) Series configuration

(iii) Parallel configuration

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

a) Find current in 40Ω and 10Ω in Fig. No. 4 by node voltage analysis method.

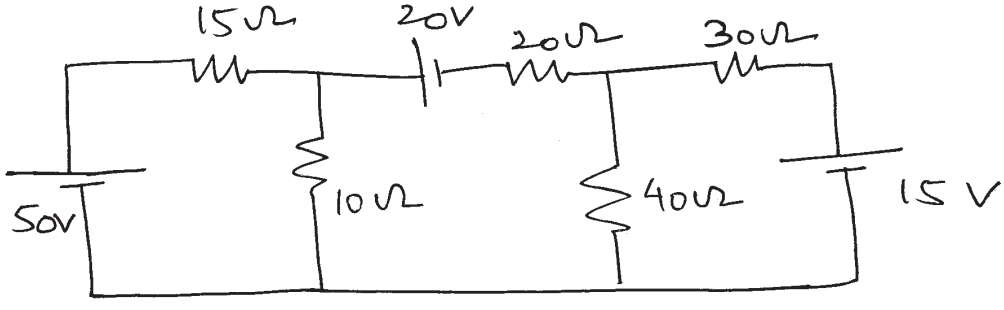

Fig. No. 4

b) Find the value of resistance to be connected across AB so as to consume maximum power in Fig. No. 5. Also find maximum power consumed by it.

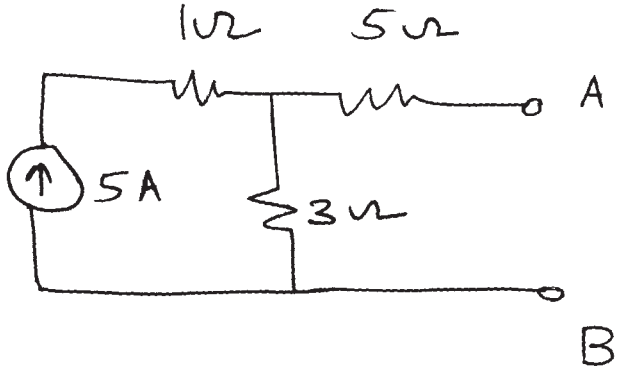

Fig. No. 5

Marks

c) Find the Z parameters for the network shown in Fig. No. 6.

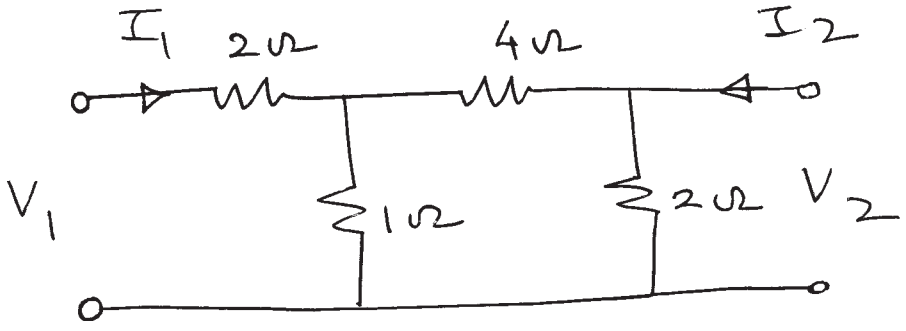

Fig. No. 6