22330

23242

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

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

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

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

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(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 the terms related to single phase AC series circuit

i) Impedance

ii) Reactance

b) Draw impedance triangle for R-L series circuit.

c) State any two conditions for resonance in series R-L-C circuit.

d) Draw a network, Indicate node and branch on it.

e) Write the formula to convert star network into delta network.

f) State Reciprocity Theorem.

g) Write Y parameter equation for a two port network.

Marks

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

a) For a series R-L circuit connected to a.c. supply

i) Draw the circuit diagram

ii) Write the equation of Resultant Impedance

iii) Draw voltage and current waveforms.

b) Derive the expression for Resonant frequency of series Resonant circuit.

c) Explain the conversion of practical voltage source into equivalent current source using suitable example.

d) State superposition theorem. Write the steps to find current in an element using Super Position Theorem.

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

a) Define and state equations for:

i) Reactive Power

ii) Apparent Power

b) Compare series and Parallel Resonance on the basis of

i) Equation for Resonant Frequency

ii) Impedance

iii) Current

iv) Magnification

c) Derive expression for transformation of delta into star network.

d) State Norton's Theorem also draw its equivalent circuit.

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

a) A series RC circuit consists of R = 10 Ω C = 200 μF. It is connected across 250 V, 50 Hz, 1 ϕ AC supply. Calculate

i) Capacitive Reactance

ii) Impedance

iii) Total current

iv) Power factor

Marks

b) Determine equivalent impedance and total current for the circuit shown in Fig. No. 1.

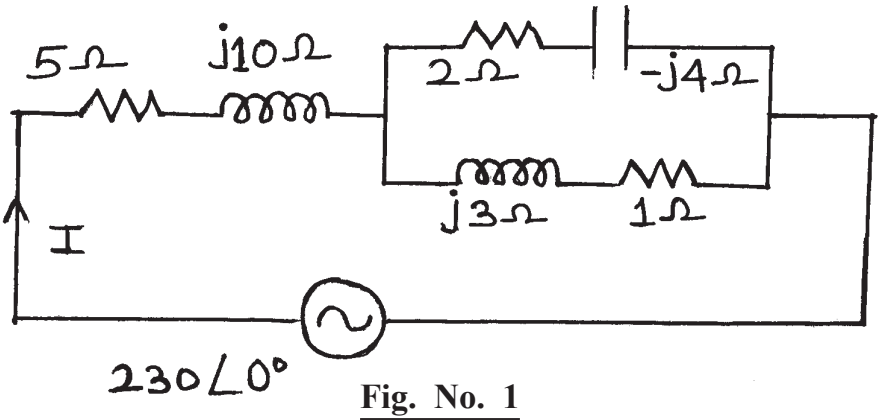

Fig. No. 1

c) A Parallel Resonant Circuit has R = 10Ω L = 0.1H, C = 10μF. Calculate the Resonant frequency. Draw the circuit diagram if it is connected to 10V.

d) Calculate the current in 4Ω resistor using Mesh Analysis for the circuit shown in Fig. No. 2.

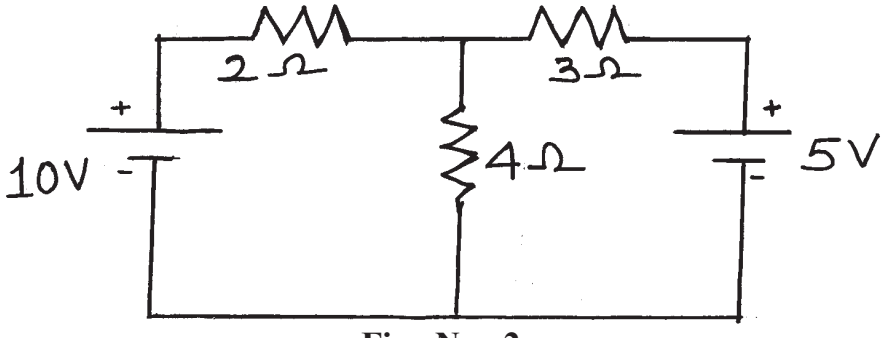

Fig. No. 2

e) Find Thevenin's equivalent circuit across terminals AB for the circuit shown in Fig. No. 3.

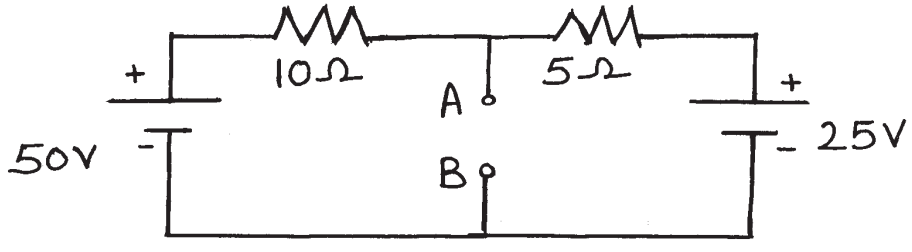

Fig. No. 3

Marks

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

a) A Series Resonant Circuit consists of R = 10Ω, L = 0.1H and C = 50μF. It is connected to 100 V, 50 Hz AC supply. Calculate the following :

i) Resonant Frequency

ii) Q factor of circuit

iii) Current at resonance

b) Using Super Position theorem calculate current through impedance 3 + j4 for the circuit shown in Fig. No. 4.

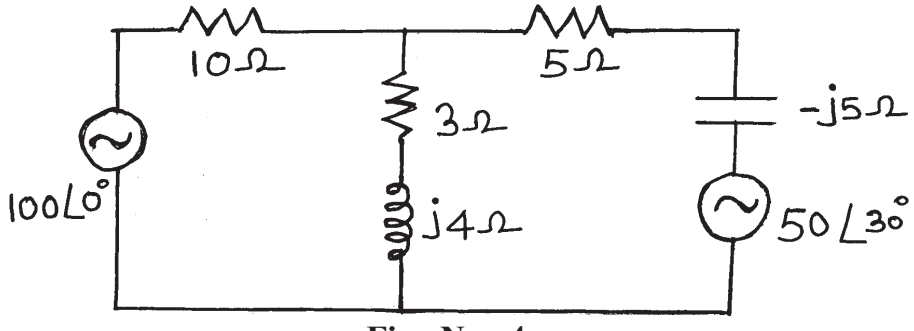

Fig. No. 4

c) Explain ABCD parameters also write its two applications.

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

a) Using Nodal analysis calculate current in each branch of the network as shown in Fig. No. 5.

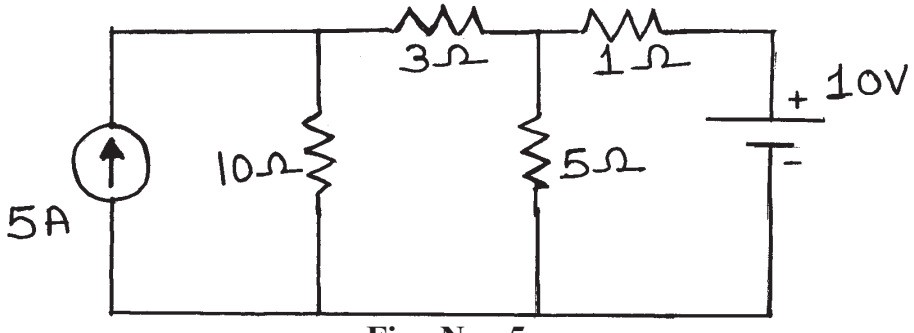

Fig. No. 5

Marks

b) Determine Maximum Power delivered to the load in the circuit shown in Fig. No. 6.

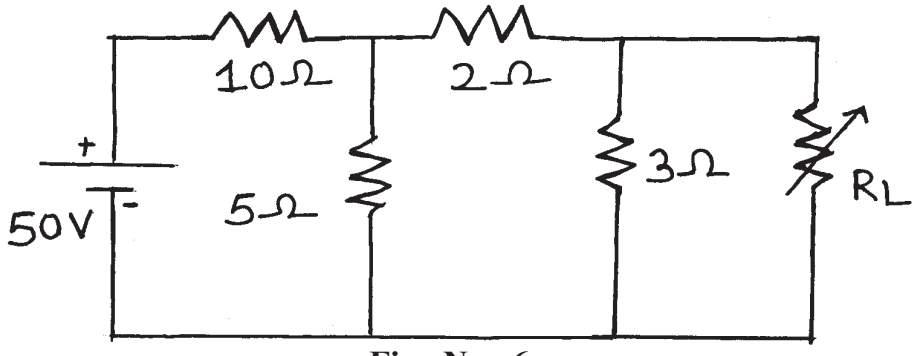

Fig. No. 6

c) Calculate Z parameters for the network shown in Fig. No. 7.

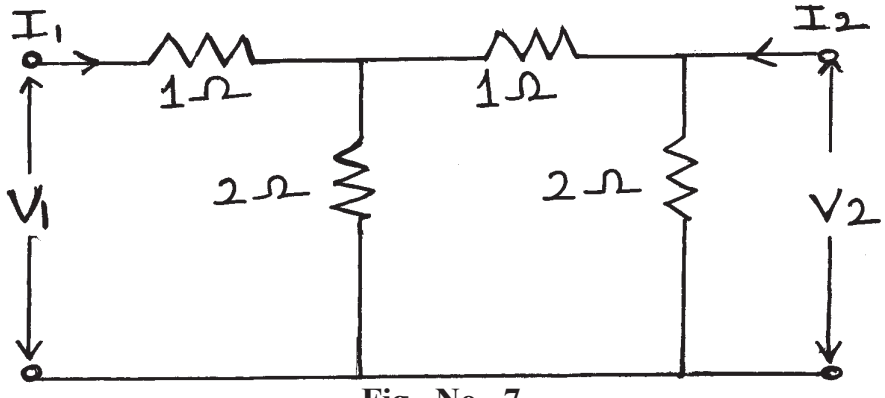

Fig. No. 7