

M.Sc. S.Y. (Electronics) CBCS Pattern Semester-III
PSELT301-Core-IX Paper-I : Network Analysis and Synthesis

P. Pages : 3

Time : Three Hours



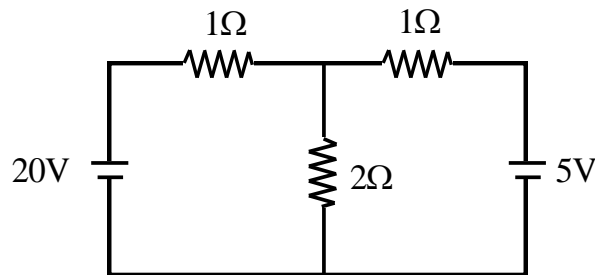
GUG/W/23/11252

Max. Marks : 80

- Notes :
1. All questions are compulsory and carry equal marks.
 2. Draw neat diagram wherever necessary.
 3. Use of calculator/log table is allowed.

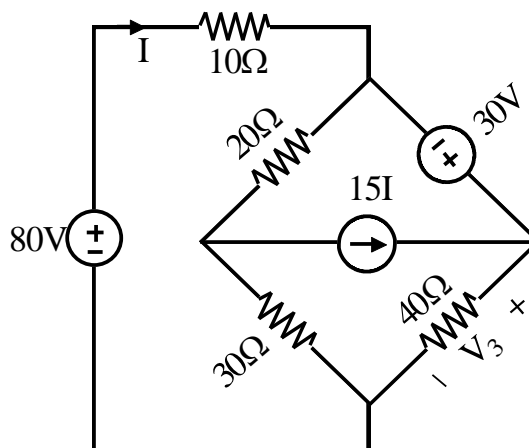
Either:

1. a) Explain the mesh analysis. 8
- b) Find current in resistors using mesh analysis in the following network. 8



OR

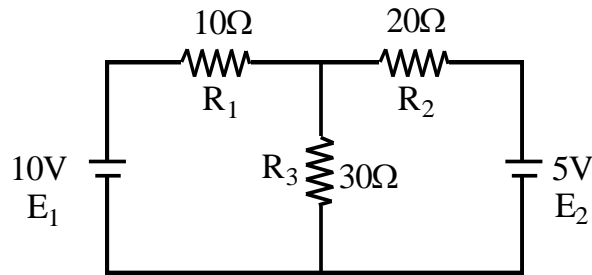
- c) What is super mesh analysis? Explain. 8
- d) Determine V_3 in the following network using super mesh analysis. 8



Either:

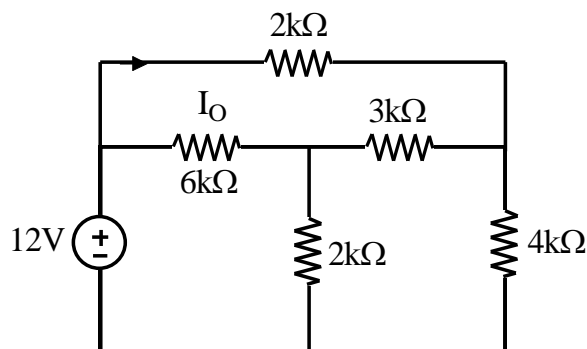
2. a) What is reciprocity theorem? Explain. 8

- b) Find the current through each resistor in the following network using superposition theorem. 8



OR

- c) Explain the star – delta and delta – star transformation in the network. 8
- d) State and prove Norton's theorem. Find current I_0 in the following network using Norton's theorem. 8



Either:

3. a) State and explain any two properties of Laplace Transform. 8
- b) Determine partial fraction expansion for 8

$$F(s) = \frac{s+3}{s^3 + 7s^2 + 10s}$$

OR

- c) State and prove Heaviside's expansion theorem. 8
- d) Find the inverse transform of the function, 8

$$F(s) = \frac{1}{(s+1)^4} + \frac{s-3}{(s-3)^2 + 6}$$

Either:

4. a) Explain the difference between Cauer form and Foster form of realization. 8

- b) The driving point impedance of a one port LC network is given by,

8

$$Z(s) = \frac{3(s^2 + 1)(s^2 + 16)}{s(s^2 + 9)}$$

Obtain the second Foster form of an equivalent network.

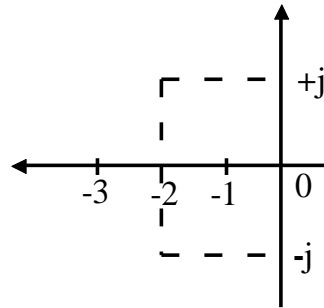
OR

- c) Explain significance of pole and zero.

8

- d) Determine the system function if the dc gain of the system is 10 and pole-zero plot is shown in the following figure.

8



5. a) Explain state variable analysis.

4

- b) Explain Norton's theorem.

4

- c) What is partial expansion in Laplace Transform? Explain.

4

- d) Explain meaning of one port and two port network.

4
