D 23531   (Pages : 3)   Name...

Reg. No...

THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION DECEMBER 2011

CS 04 306—ELECTRONIC CIRCUITS AND SYSTEMS

Time : Three Hours   Maximum : 100 Marks

Answer all *questions.*

Part A

1. State and explain Kirchhoff's voltage and current laws.

2. For the given graph in Fig. 1, write the tie–set schedule and obtain the relation between branch currents and link currents.
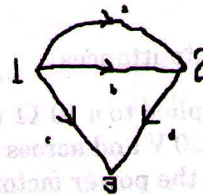

Fig. 1

3. State and prove maximum power transfer theorem.

4. What do you mean by 3 phase circuits with balanced and unbalanced loads ?

5. With circuit diagram, explain any one bridge circuit suitable for measuring very small resistance values.

6. Write a note on lattice networks.

7. Define and explain the concept of transfer function.

8. Derive the impulse response of second order system.   (8 × 5 = 40 marks)

Part B

1. (a) Using loop current method, find current through 4Ω resistor in Fig. 2.
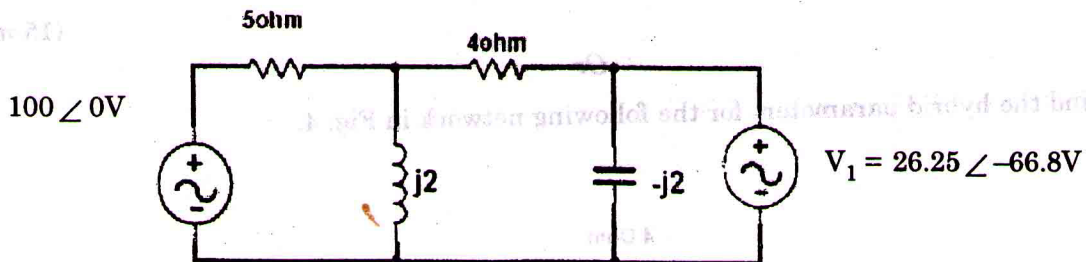

Fig. 2

(9 marks)

(b) What are incidence matrices ? Explain with example. Mention the relationship betweem them.

(6 marks)

Or

Turn over

(c) For the circuit given in Fig. 3 below, compute i_6 by suitable analysis.
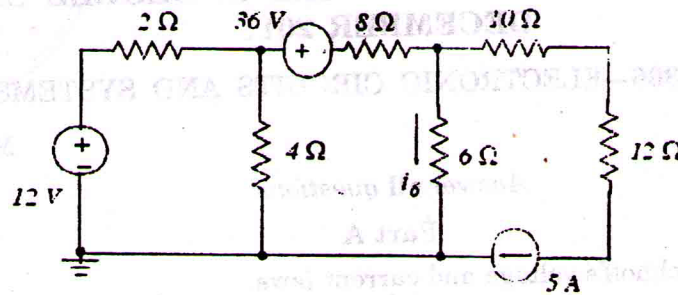

Fig. 3

(10 marks)

(d) Explain driving point and transfer admittances.   (5 marks)

2. (a) A sine wave of $v(t) = 200 \sin 50t$ is applied to a 10 Ω resistor in series with a coil. The reading of a voltmeter across the resistor is 120 V and across the coil is 75 V. Calculate the power and reactive volt-amperes in the coil and the power factor of the circuit.

(10 marks)

(b) Explain the phasor concept used in ac circuit analysis.   (5 marks)

Or

(c) Explain three and four wire systems in detail.   (5 marks)

(d) A balanced star-connected load of $(4 + J3)$ Ω per phase is connected to a balanced 3-phase 400 V supply. The phase current is 12 A. Find the total active power, reactive power and total apparent power.

(10 marks)

3. (a) Explain the principle of Maxwell and Weins bridge with circuit and equations. Illustrate applications.

(15 marks)

Or

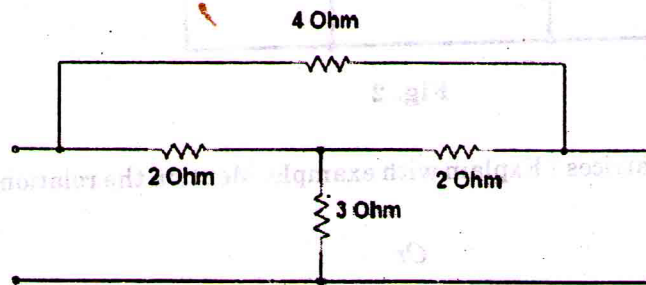(b) Find the hybrid parameters for the following network in Fig. 4.

Fig. 4

(15 marks)

4. (a) Discuss the stability of the system with characteristic equation $f(s) = s^3 + 3s^2 + 10s + 3$.

(6 marks)

(b) Find the damping ratio and natural frequency osicllation of $G(s) = \dfrac{10}{s(s+2)}$.　　(6 marks)

Or

(c) Determine the bandwidth and cutoff frequency for the filter shown in Fig. 5 below. Derive its transfer function.
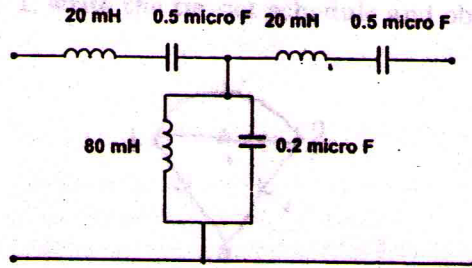

Fig. 5

(15 marks)

$[4 \times 15 = 60 \text{ marks}]$