Exam.Code:0906
Sub. Code: 6259

2023

B.E. (Electronics and Communication Engineering)

Second Semester

EC-204: Electrical Science

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.

x-x-x

I. **Attempt the following:**

a. What are different energy sources?
b. Define the principle behind Reciprocity's Theorem.
c. What is the relation between resistances of star and delta connections?
d. How can the stability of network be defined using Routh-Hurwitz criterion?
e. What is constant K type filter. (5*2)

UNIT- I

II. a. Find the equivalent star network of the circuit shown in fig. 1. (5)

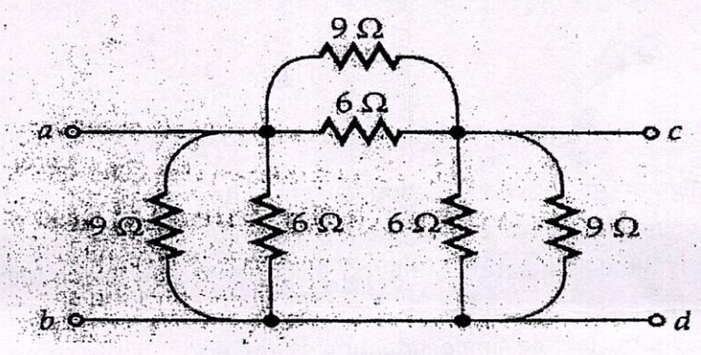

Fig.1

b. Find the current and power dissipated in the 5-ohm resistor in the circuit shown in fig.2. (5)

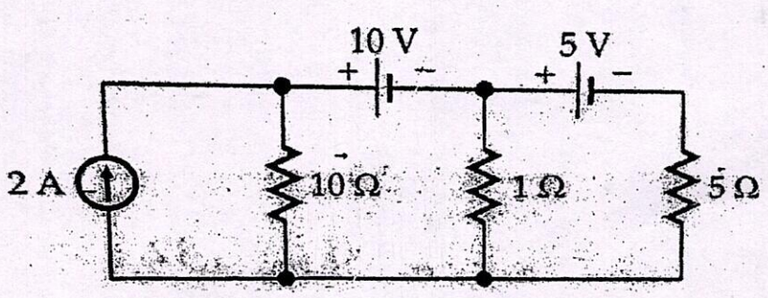

Fig.2

III. a. Explain Tellegen's Theorem with example. (5)

b. What is the power loss in the 10-ohm resistor? Use Thevenin's theorem in fig. 3? (5)

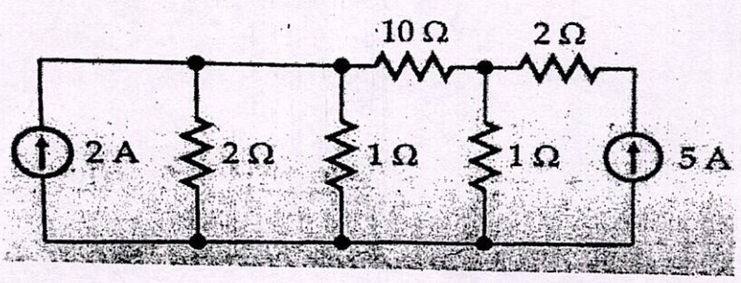

Fig. 3

P.T.O.

IV. a. Check the stability of the polynomial $P(s)= S^6+ S^5 + 5\ S^4 + 3S^3 + 2\ S2^2 -4S-8$ by applying Routh- Hurwitz criterion. (5)

b. What are the restrictions on location of poles and zeros in driving point functions? (5)

UNIT-II

V. a. Determine the Z-Parameters of the network shown in fig. 5. (5)

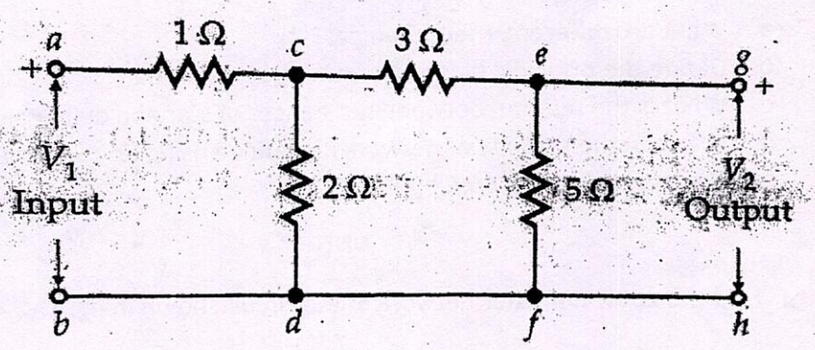

Fig. 5

b. What is h-parameters. What is the relation between h and Z parameters? (5)

VI. a. Design an m-derived T section low pass filter to have a cut-off at 7KHz and design impedance is 600 ohms and frequency of infinite attenuation is 10.5 KHz. (5)

b. What is the classification of filters? Calculate the characteristic impedance for pure reactive network. (5)

VII. a. On what principle single induction motor works. Write some applications. (5)

b. What are different speed control methods for DC motor. (5)

x-x-x