Exam. Code: 0927
Sub. Code: 6946

1129

B.E. (Electronics and Communication Engineering)
Third Semester
EE-309: Electric 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 Part. Use of scientific calculator is allowed.*

x-x-x

I. (a) How will you justify that the voltage across capacitor cannot change instantaneously. (2)
(b) How would you determine the current passing through the independent voltage source? (2)
(c) A load is connected to a network, at the terminals to which load is connected R_{th}=10kΩ and V_{th}=40v. Find the maximum possible power supplied to the load. (2)
(d) What is the significance of poles and zeros of system? (2)
(e) Draw π-section high pass and low pass filters. (2)

Part- A

II. (a) Two bulbs of 100W,220v are required to be connected across a 400v supply. Find the value of resistance to be inserted in the line so that the voltage across bulbs cannot exceed 220v. (5)
(b) Derive the equations required to convert star-connected network to Δ (delta) connected network and vice-versa. (5)

III. Explain with suitable examples, how will you decide Thevenin's equivalent circuit if a network (10)
(i) Consists of only independent sources
(ii) Consists of independent and dependent sources
(iii) Consists of dependent sources only.

IV. (a) What is network function? Define the terms "Driving point impedance" and "driving point admittance" of a one port network (5)
(b) Define the following terms, (i) Link (ii) Graph (iii) Tree (iv) Node (v) Branch (5)

P.T.O.

Part-B

V. (a) Using ABCD parameters. Prove that AB-BC=1. (5)

(b) Two two-port networks with transmission parameters A1, B1, C1, D1 and A2, B2, C2, D2 respectively are cascaded. What is the transmission parameter matrix of the cascaded network? (5)

VI. (a) Explain working of LPF at higher frequencies and HPF at low frequencies in case of pure reactive filters. (4)

(b) Design a T and π section constant-k high pass filter having cut-ff frequency of 12kHz and nominal impedance of 400Ω. Find (i) characteristic impedance and phase constant at 20kHz (ii) attenuation at 5kHz. (6)

VII. (a) Explain torque and EMF equations of DC motors. (5)

(b) Explain torque slip characteristics of induction motors. (5)

x-x-x