(C) Obtain an expression for transfer gain of an amplifier with feedback. 4

(D) State advantages of negative feedback. 4

OR

(P) What are different types of Noise ? Explain thermal noise. 4

(Q) Draw circuit diagram of two stage RC-coupled amplifier. Discuss its gain-frequency response. 4

(R) Explain effect of series negative feedback on an input impedance of the amplifier. 4

(S) A voltage gain the amplifier is reduced from 60 to 15 due to negative feedback. What is feedback factor ? 4

5. (A) Define transducer. Why is it needed ? Distinguish between a passive transducer and an active transducer with suitable example. 8

(B) Draw block diagram of function generator and explain working of each block in brief. 8

OR

(P) What are inductive transducers ? Discuss construction, working and characteristics of LVDT. 8

(Q) Draw block diagram of general purpose CRO and explain function of each block. 8

AQ–891

M.Sc. (Semester—II) (CBCS Scheme) Examination

PHYSICS

2 PHY-4 (i)

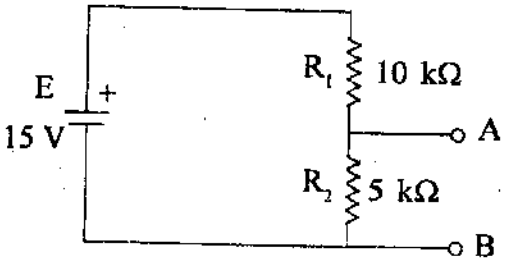
(Network Theorems and Solid State Devices)

Time—Three Hours] [Maximum Marks—80

1. (A) Discuss various steps involved in solving network by using Norton's theorem. 6

(B) Explain superposition theorem with suitable example. 5

(C) Obtain Norton's equivalent circuit of the network given below : 5

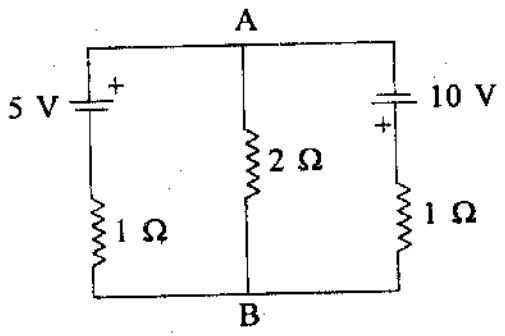


OR

(P) State and explain Maximum power transfer theorem. 5

(Q) Explain with phase diagram, the relationship for voltage and current in resistance and capacitor under ac signal. 5

(R) Find out the current through '2 Ω' resistor using superposition theorem for the following circuit. 6



2. (A) What are extrinsic semiconductors ? Explain mechanism of current flow through the semiconductor. 4

(B) Discuss an avalanche breakdown and zener breakdown. 4

(C) Explain the construction and working of UJT. 4

(D) Distinguish between JFET and BJT. 4

OR

(P) Explain the use of UJT as relaxation oscillator. 4

(Q) A battery of 8 V is connected between bases of UJT. If intrinsic stand off ratio of UJT is 0.6, find the value of peak point voltage. 4

(R) Explain the terms 'Depletion region' and 'Potential barrier' for p-n junction. 4

(S) Give the construction and uses of LED. 4

3. (A) Explain with circuit diagram, the working of two-diode full wave rectifier. Obtain an expression for its ripple factor and rectification efficiency. 8

(B) Explain the construction, working and characteristics of SCR. 8

OR

(P) Draw block diagram of regulated power supply. Discuss in detail working of Zener regulator circuit with respect to line voltage and load variations. 7

(Q) Explain the use of IC-317 as adjustable voltage regulator. Design an adjustable voltage regulator using IC-317 for output voltage V_0 = 5 V to 12 V. Given : Current limiting resistor, R_1 = 240 Ω, V_{ref} = 1.25 V. Neglect adjustment terminal current. 9

4. (A) Classify amplifiers on the basis of position of an operating point. 4

(B) Obtain the values of collector current and collector voltage of CE-transistor if V_{CC} = 10 V, R_B = 500 kΩ, RL = 2 kΩ, β_{dc} = 100. 4