

(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

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

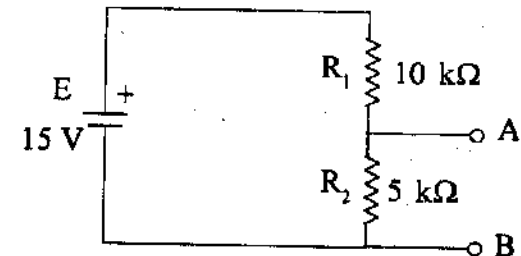
2 PHY-4 (i)

(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

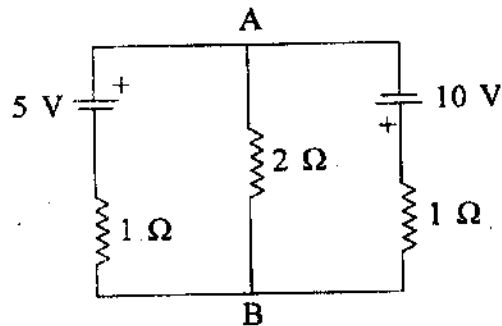


OR

- (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 ' $2\ \Omega$ ' 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 $V_o = 5\text{ V to }12\text{ V}$. Given : Current limiting resistor, $R_i = 240\ \Omega$, $V_{ref} = 1.25\text{ V}$. 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 $V_{cc} = 10\text{ V}$, $R_b = 500\text{ k}\Omega$, $R_L = 2\text{ k}\Omega$, $\beta_{dc} = 100$. 4