KNT/KW/16/5126

Bachelor of Science (B.Sc.) Semester—III (C.B.S.) Examination
ELECTRONICS
Paper—I
(Op-AMP and Power Supply)

Time : Three Hours] [Maximum Marks : 50

N.B. :— (1) **ALL** questions are compulsory and carry equal marks.

(2) Draw well labelled diagrams wherever necessary.

EITHER

1. (A) Explain the modes of operation of difference amplifier. Explain the D.C. analysis of dual input balanced output difference amplifiers. 5+5

OR

(B) Draw a block diagram of OP-AMP and explain each block. Define the following terms :—

(i) Slew rate

(ii) Input bias current

(iii) Common Mode Rejection Ratio

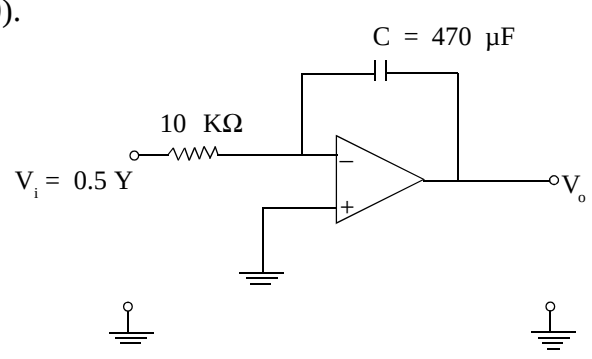
(iv) Input Offset Voltage. 6+4

EITHER

2. (A) Explain the operation of OP-AMP as subtracting amplifier. Explain the concept and significance of virtual ground in OP-AMP. 5+5

OR

(B) Explain the working of OP-AMP as integrator. Draw the necessary O/P waveform for square wave I/P. Calculate the O/P of following circuit after 1.5 sec. (the capacitor is fully discharged at t = 0).



6+4

EITHER

3. (A) What is Rectifier ? Draw the circuit diagram of full wave rectifier and explain the construction and working with I/P and O/P waveform. Explain working of transistor as a Shunt Regulator. 1+5+4

OR

(B) State the drawbacks of unregulated power supply. Define Line Regulation, Load Regulation and internal resistance of power supply. Explain with necessary circuit diagram the working of transistorised power supply with short circuit protection. 2+6+2

EITHER

4. (A) Explain working of SMPS and state its advantages and disadvantages. 6+4

OR

(B) Explain the working of variable power supply using LM 317-IC. What is the concept of LDO ? Explain. 6+4

5. Attempt any **TEN** :—

(A) Define CMRR of OP-AMP.

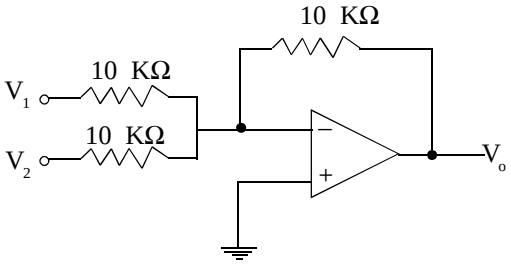
(B) State any two characteristics of ideal OP-AMP.

(C) Define slew rate.

(D) Draw the characteristics of Schmitt trigger.

(E) Draw the circuit diagram of sign changer using OP-AMP.

(F) Calculate the output of the following circuit :



$V_1 = V_2 = 1V$

(G) Define ripple factor.

(H) What is the need for short circuit protection ?

(I) Compare half-wave, full-wave and bridge rectifier (one point).

(J) State the principle of LDO regulator.

(K) Gives the full form of SMPS.

(L) Give any two advantages of IC regulator. 10×1=10