Bachelor of Science (B.Sc.) Semester–III Examination

ELECTRONICS (OP-AMP and Power Supply)

Optional Paper–I

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 differential mode gain and common mode gain. Compare characteristics of ideal and practical OP-AMP. Explain slew rate ? What is the effect of slew rate on high frequency output ? 3+3+4

OR

(B) How many pin IC is 741 ? Explain the function of each pin. Draw the block diagram of IC OP-AMP. Explain each block. 1+4+5

2. (A) Explain the operation of OP-AMP as inverting amplifier. State its advantages and limitations. Explain OP-AMP as differentiator. 4+2+4

OR

(B) Explain OP-AMP as differentiator output for the following inputs :
(i) Square wave
(ii) Sine wave
(iii) DC
(iv) Ramp
(v) Triangular.
Explain OP-AMP as zero crossing detector and its application as wave shaping circuit. 5+5

3. (A) What is the need for short circuit protection ? Explain short circuit protection circuit with neat diagram. Explain the design and working of a series pass regulator. 5+5

OR

(B) What is a rectifier ? Draw circuit diagram of full wave rectifier and explain the working with input and output waveforms. With neat circuit diagram, explain the working of a zener regulator. 6+4

4. (A) Design and explain the working of a variable power supply using LM317 IC. Explain the principle of SMPS. What are the advantages of SMPS ? 5+4+1

OR

(B) What are the limitations of linear voltage regulator ? What are the advantages of IC voltage regulators ? Explain the concept of LDO regulator. 3+3+4

5. Solve any **TEN** :
(A) What is CMRR ?
(B) What is temperature drift in OP-AMP ?
(C) Draw the symbol of OP-AMP.
(D) Explain the concept of virtual ground in OP-AMP.
(E) Draw the circuit diagram of voltage follower.
(F) Define hysterisis voltage.
(G) What is the need of regulated power supply ?
(H) Define Ripple factor.
(I) Define Form factor.
(J) State the advantages of LDO.
(K) What is SMPS ?
(L) Give any two features of IC regulators. 1×10