NKT/KS/17/5126

Bachelor of Science (B.Sc.) Semester—III (C.B.S.) Examination

ELECTRONICS

(OP-AMP & POWER SUPPLY)

Paper—I

Time : Three Hours] [Maximum Marks : 50

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

(2) Draw neat diagrams wherever necessary.

(3) Only **10** out of **12** sub-questions are to be attempted from Question No. **5**.

EITHER

1. (A) Draw the circuit of emitter coupled difference amplifier and explain its working in common and differential modes. 6

What is the need for two power supplies in a difference amplifier ? 4

OR

(B) Draw the block diagram of OP-Amp and explain each block. 6

State the basic characteristics of ideal OP-Amp. 4

EITHER

2. (A) Explain the operation of OP-Amp as inverting amplifier. 6

If the adder has R_f = 10 kΩ, R_1 = 10 kΩ, R_2 = 2.2 kΩ, R_3 = 3.3 kΩ, V_1 = 6V, V_2 = – 3V, V_3 = – 0.75 V. What is its output voltage ? 4

OR

(B) Explain the operation of OP-Amp as integrator. State its limitations. 5+2

Explain OP-Amp integrator output for the following inputs :

(i) Square wave

(ii) Sine wave

(iii) DC. 3

EITHER

3. (A) Give the working of Bridge wave rectifier and state its advantages. 6

Explain the need of filter in a power supply. Give the working of capacitive filter. 4

OR

(B) Differentiate between unregulated and regulated power supply. Explain the Zener diode as a voltage regulator and state its advantages. Explain line and load regulation. 2+5+3

EITHER

4. (A) What are the general features of I_C regulator ? Explain in brief (any five). 5

Design and explain the working of a variable power supply using LM 317 PC. 5

OR

(B) Draw the block diagram of Switched Mode Power Supply and explain its working. 6

What is the concept of LDO ? Explain. State its advantages. 4

5. Answer any **TEN** :—

(a) Draw the symbol of OP-Amp.

(b) State the limitations of DC amplifier.

(c) What is CMRR ?

(d) Draw the circuit diagram of voltage follower.

(e) State the limitation of Integrator.

(f) Explain how comparator will work as zero crossing detector.

(g) What is rectifier ?

(h) State the limitations of zener regulator.

(i) Draw the circuit for +5V power supply using I_C regulator.

(j) What is voltage stability factor ?

(k) State the principle of LDO.

(l) State any two applications of SMPS. 1×10