

Roll No. ....

Total Pages : 3

**GSM/D-20**

**936**

**OP-AMP AND LINEAR INTEGRATED  
CIRCUITS**

Paper-I

Time Allowed : 3 Hours]

[Maximum Marks : 40

**Note** : Attempt **five** questions in all, selecting at least **one** question from each Unit. Question No. **1** is compulsory. All questions carry equal marks.

**Compulsory Question**

1. (a) Write the characteristics of an Ideal operational Amplifier. 2
- (b) Define input Bias current. Also define offset voltage. 2
- (c) What is Buried layer in an I.C.? Why is it used? 2
- (d) A Power supply has voltage regulation of 2%. If no load voltage is 30V, what is the full load voltage? 2

**UNIT-I**

2. (a) Find the expression for the gain of an Operational Amplifier in Non-Inverting configuration. 4

**936/K/797**

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- (b) Explain with the help of circuit diagram, how Operational Amplifier can be used as difference Amplifier. 4
3. (a) Discuss the working of Operational Amplifier as a Summing Amplifier. 3
- (b) Derive relation between input and output in a double ended differential Amplifier. 5

## UNIT-II

4. (a) Explain with the help of circuit diagram, the working of Operational Amplifier as an integrating circuit. 4
- (b) Discuss the working of Op-amp as a multiplier of different signals. 4
5. (a) Explain the working of a High pass first order active filter using op-amp. 4
- (b) Explain the operation of Op-amp as differentiating circuit. 4

## UNIT-III

6. (a) Discuss the various steps to fabricate NPN transistor in Integrated Circuit. 3
- (b) Discuss the Photolithographic etching process in detail. 3

- (c) What do you mean by SSI, MSI, LSI and VLSI in IC fabrication technology? 2
7. (a) Discuss the Epitaxial growth in brief. 3
- (b) Explain the importance of  $\text{SiO}_2$  layer. 2
- (c) Explain the various methods for making diodes in Integrated Circuit technology. 3

#### UNIT-IV

8. (a) Draw the functional block diagram of three Terminal voltage regulators & explain in brief. 4
- (b) Define Line regulation and Load regulation. Elaborate the difference between series and shunt type Voltage regulation. 4
9. (a) Explain the working of Current regulation using Op-amp. 4
- (b) Explain with the help of circuit diagram, the working of Shunt regulator. What are its advantages over a series voltage regulator? 4