[3 Hours] **[Total Marks: 80]**

Instructions:

1. Question No: 1 is compulsory.
2. Answer any three from the remaining five questions.

1 **(5 x 4)**

a) Recall the h-parameter equivalent model of Common Emitter voltage divider bias configuration and define all the h-parameters.

b) Interpret the Drain-source characteristics of n-channel depletion type MOSFET with a neat figure for different values of V_{GS}.

c) Draw the circuit diagram of op-amp based integrator circuit and write the expression of voltage gain.

d) State the application of Opto-isolator with a neat figure.

2 a) Discuss the need of biasing in BJT amplifiers. Illustrate the voltage divider biasing technique in detail. **(10)**

b) Draw the h-parameter equivalent model of a voltage divider bias Common emitter BJT amplifier and derive expression of voltage gain. **(10)**

3 a) With a neat figure explain the construction and working principle of n-channel depletion type MOSFET. **(10)**

b) Illustrate the different biasing techniques employed in MOSFET amplifiers. **(10)**

4 a) Explain op-amp as a non-inverting amplifier. Design a non-inverting amplifier for voltage gain of 11. **(10)**

b) Illustrate with neat diagram, the application of Op-amp as adder circuit. Derive the output expression. **(10)**

5 a) Explain the construction and working of Schottky diode. **(10)**

b) Explain the block diagram of op-amp. Draw its frequency response characteristics. **(10)**

6 Write short notes on **ANY TWO**

1) Astable Multivibrator using IC555 **(20)**

2) Zener diode as clipper

3) LM317 as Adjustable voltage Regulator