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

Note:

(1) Question 1 is compulsory
(2) Solve any three questions out of remaining
(3) Assume suitable data wherever necessary

Q.1 Solve any four **[20]**

(a) Draw and explain in brief the output characteristics of CE configuration.
(b) In the Colpitts oscillator, C1=0.2µF and C2 =0.02µF. If the frequency of the oscillator is 10kHz,find the value of the inductor and the required gain
(c) Draw and explain in brief: block diagram of typical OP-AMP.
(d) Draw and explain in brief: block diagram of the SSB modulation system.
(e) Draw and explain basic block diagram of the digital communication system..

Q.2 (a) Discuss the principle of amplitude modulation .Draw and explain the block diagram of the A M transmitter. **[10]**

(b) State necessity of biasing. Draw circuit and explain collector feedback biasing circuit. **[10]**

Q.3 (a) Draw the equivalent op-amp circuit and draw and explain the transfer characteristics of Op-Amp. **[10]**

(b) In an inverting amplifier the input voltages are 5Vpp and 3Vpp with operating frequency of 3kHz draw the circuit diagram and output waveform for the given input voltages. **[10]**

Q.4 (a) Explain Frequency demodulation using Foster–Seely discriminator. **[10]**

(b) In a low level AM modulator with a modulation coefficient m=0.8 a quiescent gain Aq =100,an input carrier frequency fc=500kHz with amplitude Vc=5mV, and a 1000Hz modulating signal find the maximum and minimum voltage gains and the respective output voltage. **[10]**

Q.5 (a) Determine the deviation ratio and worst-case bandwidth for an FM system with a maximum frequency deviation of 40kHz and a maximum modulating-signal frequency fm=10kHz. **[10]**

(b) Explain: (i) Information (ii) Entropy (iii) Information rate (iv) Channel capacity. **[10]**

Q.6 (a) Write Short notes (Any Four) **[20]**

(i) comparison of DM and ADM
(ii) Summer amplifier.
(iii) Schmitt trigger.
(iv) Class A Power amplifier
