

Time:-3 Hrs

Marks: 80

N.B. : 1. Question **ONE** is **compulsory**2. Solve any **THREE** out of remaining questions

3. Draw neat and clean diagrams

4. Assume suitable data if required.

- Q. 1. A. Justify that JFET can be used as a Voltage Variable Resistor. 5  
 B. Explain the ideal characteristics of op-amp 5  
 C. With neat circuit diagram explain the use of PLL in frequency demodulation. 5  
 D. Explain detection of pulse code modulation. 5
- Q. 2. A. Explain various biasing techniques used in case of JFET. 10  
 B. Explain how op-amp can be used as differentiator. 10
- Q. 3. A. Explain the concept of virtual ground in operational amplifier. 5  
 B. State and explain Barkhausens criteria for oscillations. 5  
 C. Explain any one pulse modulation technique of your choice. 5  
 D. Determine the magnitude of  $g_m$  for a JFET with  $I_{DSS} = 6 \text{ mA}$  and  $V_P = -3 \text{ V}$  at  $V_{GS} = -0.5 \text{ V}$  and also at  $V_{GS} = -1.5 \text{ V}$ . 5
- Q. 4. A. Explain the generation of DSBSC using balanced modulator. 10  
 B. With neat diagram and waveforms explain the operating principle of PLL. 10
- Q. 5. A. With block diagram describe the principle of analog communication system. 10  
 B. Explain phase modulation in detail. 10
- Q. 6. A. What is Nyquist Criteria? What is its significance? 5  
 B. Discuss Class C power amplifier. 5  
 C. Write short note on generation of FM by Armstrong method 5  
 D. Mention important specifications of ADC and DAC required for communication. 5