

- (ix) Comparison of FDM and TDM system shows that
 (a) FDM requires lower bandwidth, but TDM has greater noise immunity
 (b) FDM requires bandwidth as well as noise immunity is greater than TDM
 (c) FDM requires channel synchronization while TDM has greater noise immunity
 (d) none of these are correct
- (x) In a digital telemetry system, frequency shift keying (FSK) represents digital data by changing
 (a) Amplitude of carrier (b) Frequency of carrier
 (c) Phase of carrier (d) Duty cycle

Fill in the blanks with the correct word

- (xi) Poisson's ratio for a metal is 0.35. The gauge factor of a strain gauge made of this metal is _____.
- (xii) The small unused bandwidth between the frequency channels to avoid interference is called _____.
- (xiii) The transmission rate (kbps) of TDM for a frame rate of 2000/s and 16 bits per frame is _____.
- (xiv) _____ gets shifted in the signals involved in frequency shift keying.
- (xv) In a Time Division Multiplexing system, each signal is allocated a separate _____ for data transmission.

Group - B

2. (a) How LVDT can be used to measure both pressure above and below the atmospheric pressure? [[CO3](Analyse/IOCQ)]
 (b) What is residual voltage? State the causes of residual voltage appeared in LVDT. [[CO2](Analyse/IOCQ)]
 (c) Summarize the advantages and disadvantages of LVDT. [[CO2](Understand/LOCQ)]
4 + (1 + 2) + 5 = 12
3. (a) What is Hall Effect? Show how Hall voltage is related to flux density of a magnetic field for a Hall Effect transducer. [[CO2](Analyse/IOCQ)]
 (b) Explain the principle of working of light dependent resistors? [[CO2](Analyse/IOCQ)]
 (c) What do you mean by 'dark resistance' of photo resistor? [[CO2](Understand/LOCQ)]
 (d) What are the main features of photodiode? [[CO2](Understand/LOCQ)]
3 + 4 + 2 + 3 = 12

Group - C

4. (a) What are the conditions of using an electromagnetic flow meter it? What are its main components, and how do they function? [[CO3](Remember/LOCQ)]
 (b) List the flowmeters that refer to the variable head type flow meter. [[CO3](Remember/LOCQ)]
 (c) What is an 'Annubar tube'? [[CO3](Remember/LOCQ)]

- (d) Calculate the induced EMF in an electromagnetic flow meter due to the flow of conductive fluid in a pipe with inner diameter of 2.75cm. The flux density is 60 mV.sec/cm² and volume flow rate is 2500 cm³/min. [[CO3](Apply/IOCQ)]
(1 + 4) + 2 + 2 + 3 = 12
5. (a) What is a Thermocouple? What type of Transducer is it? State the material composition of any one base metal type of thermocouple. [[CO3](Remember/LOCQ)]
 (b) What is meant by cold junction compensation? Why is it necessary? [[CO3](Understand/LOCQ)]
 (c) What is a thermopile? Explain how one can measure an average temperature of a reaction column using thermocouples. [[CO3](Analyse/IOCQ)]
(1 + 1 + 1) + (2 + 2) + (2 + 3) = 12

Group - D

6. (a) Explain the term 'coding'? What is source coding? What are the different types of source coding? [[CO4](Understand/LOCQ)]
 (b) What are the different types of line and channel coding? [[CO4](Remember/LOCQ)]
 (c) What are efficiency and redundancy in respect of data transmission? Find a relation between them. Calculate the efficiency and redundancy of AMI code and 24B1P code. [[CO4](Analyse/IOCQ)]
 (d) What do you mean by quantization error? [[CO4](Understand/LOCQ)]
(1 + 1 + 1) + 2 + (2 + 1 + 2) + 2 = 12
7. (a) Describe the working principle of a frequency telemetry system providing relevant diagram. [[CO5](Understand/LOCQ)]
 (b) Why frequency telemetry is preferred to voltage or current telemetry systems? [[CO5](Remember/LOCQ)]
 (c) What do you mean by digital telemetry system? [[CO5](Understand/LOCQ)]
8 + 2 + 2 = 12

Group - E

8. (a) What do you mean by pipeline telemetry? [[CO5](Understand/LOCQ)]
 (b) A multiplexing system based on TDM is characterized by a frame composed of 10 Time Slots; in each time slot, 128 bits are transmitted. The system is used to multiplex 10 telephone channels, each of which has a transmission rate of 64 kbit/s. Determine the transmission rate of the multiplexer and the duration of the frame. [[CO6](Remember/LOCQ)]
 (c) Why is a band pass filter used in a demodulator channel on the receiving side of the FDM telemetry system? [[CO6](Apply/IOCQ)]
6 + (2 + 2) + 2 = 12
9. (a) Draw the block schematic diagram of TDM system of telemetering and make appropriate labels, both on the transmitting and receiving sides. [[CO6](Apply/IOCQ)]
 (b) What is a time frame in this system? [[CO6](Remember/LOCQ)]

(c) Why is synchronization necessary in all TDM system?

[[CO6](Understand/LOCQ)]

8 + 1 + 3 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	63.54	36.46	0