

- N.B. (1). Question No.1 is compulsory.  
 (2). Out of remaining attempt any three.  
 (3). Assume & mention suitable data wherever required.  
 (4). Figures to right indicates full marks.

Q1 Write any **four** of the following

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- a) Explain pre-emphasis & de-emphasis
- b) Explain shot noise & transit time noise in brief
- c) State drawbacks of delta modulation system & how it is removed
- d) Explain principles of Sky wave propagation in brief.
- e) State and prove differentiation property in time domain of Fourier transform

Q2

- a) Explain PWM generation & degeneration method in detail
- b) Explain PCM Encoder & PCM decoder with block diagram

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Q3

a) a sinusoidal carrier has an amplitude of 10 V & a frequency of 100 KHz. It is amplitude Modulated by a sinusoidal voltage of amplitude 3V & a frequency of 500 Hz. Modulated Voltage is developed across 75  $\Omega$ .

- (i) Write the equation of modulated wave
- (ii) Determine modulation index
- (iii) Calculate total average power
- (iv) Power carried by sidebands
- (v) Spectrum of modulated wave

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b) Explain in detail indirect method of generation of FM with suitable diagram

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Q4

a) What is multiplexing in communication system? Draw and explain transmitter and Receiver of FDM

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b) Explain with reference to AM receiver (i) fidelity (ii) selectivity (iii) sensitivity  
 (iv) Image frequency and its rejection. (v) Double spotting

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Q5

- a) Draw the ASK, FSK & PSK waveforms for digital data **11010011** 06
- b) What do you mean by inter symbol interference & how it is avoided 08
- c) What do you mean international standards for communication system?  
How frequencies are allocated? 06

Q6 Write short notes on ( **any four** ) 20

- a) friss formula b) sampling theorem c) line codes d) types of communication channel
- e) Space wave propagation

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