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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY WAKNAGHAT

T-2 EXAMINATION (APRIL 2019)

B.Tech 5th Sem. (ECE)

COURESE CODE: 10B11EC511   MAX. MARKS: 25

COURSE NAME: Digital Communications

COURSE CREDITS: 4   MAX. TIME: 1.5 Hrs.

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q1(a). Twenty four voice signals are sampled uniformly and then have to be time division multiplexed. The highest frequency component for each voice signal is 3.4 kHz.

   i)   If the signals are pulse amplitude modulated using Nyquist sampling rate, what would be the minimum channel bandwidth required?

   ii)   If the signals are pulse code modulated with an 8 bit encoder, what would be the sampling rate? The bit rate of the system is given as $2* 10^6$ bits/sec.   **(1.5+1.5 = 3)**

Q1(b). Discuss equalization in context of inter symbol interference.   **(2)**

Q2(a). Discuss the working of pulse code modulation with its transmitter and receiver.   **(3)**

Q2(b). Discuss μ law and A law.   **(2)**

Q3(a). Why is Differential pulse code modulation required?   **(1.5)**

Q3(b). What are the limitations of delta modulation? Discuss the method to overcome these limitations.   **(2+1.5=3.5)**

Q4. With the help of transmitter and receiver diagrams, discuss the working of frequency shift keying. Compare FSK with PSK also.   **(4+1=5)**

Q5(a). Define multiplexing. Discuss the working of time division multiplexing.   **(2.5)**

Q5(b). Discuss the digital hierarchy based on time division multiplexing.   **(2.5)**