

**JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT**

**TEST-3 EXAMINATION- May -2019**

**B.Tech. IV Semester**

COURSE CODE: 17B11EC412

MAX. MARKS: 35

COURSE NAME: Analogue and Digital Communications

COURSE CREDITS: 04

MAX. TIME: 2 HRS

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Take necessary assumption when it is required.*

Q.1 (a) Find the value of  $Y$  in dBm where  $Y = (10\text{dBm}) + (30\text{dBm})$

(b) Explain the modulation process in communication system. Why it is necessary in communication system? [CO1] [2+3]

Q.2 (a) Find the transmission efficiency in SSB-SC with respect to DSB-SC when modulation index is 50%.

(b) Explain the Uniform and Non-uniform quantization. Design a digital communication system using PCM system, so as to achieve a signal to quantization noise ratio of at least 20 dB for an analog signal of  $S(t) = 3\cos(1000\pi t)$ . [CO2, CO4] [2+3]

Q.3 (a) Distinguish between coherent and non-coherent receivers.

(b) With help of mathematical and graphical analysis, differentiate between narrowband and wide band FM communication system. [CO2] [2+3]

Q.4 (a) Derive the relationship between the total transmitted power and carrier power of an AM system when two message frequencies modulate a carrier simultaneously.

(b) Consider a binary data sequence 100011101. Draw the waveform for the following signaling line codes formats. (a) AMI (b) Bipolar RZ (c) Split-phase Manchester [CO2, CO3] [2+3]

Q.5 (a) With neat diagram, explain the working of DPCM transmitter and receiver.

(b) Explain the working of PSK modulator and demodulator with suitable diagrams.

[CO3, CO5] [2+3]

Q.6 How Digital communication system model is different from Analogue communication systems. Explain with suitable diagram and examples. [CO1, CO5] [4]

Q.7 Write Short notes on

(a) Companding

(b) ISI

(c) Eye Pattern

[CO5] [2 + 2 + 2]