

U.G. 6th Semester Examination - 2021**PHYSICS****Course Code : BPHSDSHC5****Course Title : Communication Electronics**

Full Marks : 30

Time : 2 Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.**Sketch or circuit diagram wherever necessary.**All abbreviations have their usual meanings.*

1. Answer any **ten** questions: $1 \times 10 = 10$
- Why frequency allocation is essential in electronic communication?
 - A receiver has input signal power of 1.2 mW. If the noise power is 12 μ W, find the SNR in dB.
 - Show the envelop of an amplitude modulated wave with proper sketch.

- Define modulation index for frequency modulated signal.
- Compare DSBTCAM with SSBSCAM in terms of power consideration.
- What will be the actual as well as practical bandwidth of a frequency modulated signal?
- When the modulation percentage is 75%, an AM transmitter radiates 10KW Power. How much of this is carrier Power?
- Why is PSK always preferable over ASK in coherent detection?
- Write one advantage and one disadvantage of digital communication over analog communication.
- Why flat top PAM is widely used over natural PAM?
- What will be the minimum transmission band width of a PCM signal where the maximum frequency of message signal is 5kHz and it is quantized by 64 levels?
- What are the advantages of a geostationary satellite?

- m) Mention an advantage of 4G cellular networks over 3G cellular networks.
- n) Why is encryption needed in data communication?
- o) What is super heterodyne receiver?
2. Answer any **five** questions: $2 \times 5 = 10$
- a) What is a function of receiver in electronic communication system? Mention the name of the main building blocks of a superheterodyne receiver.
- b) An AM transmitter supplies a 110 kW of carrier power to 50 k Ω load. It operates at a carrier frequency of 1.2 MHz and is 80% modulated by 3KHz sinewave. Sketch the frequency spectrum for this system.
- c) What do you mean by demodulation? Mention the disadvantage of a slope detector.
- d) State Carson's rule in context of frequency modulation.
- e) A sinusoidal signal with a maximum peak input voltage of 5 V is applied to a PCM channel using a 10-bit code word. Find the number of quantization levels used and the rms quantization noise levels in volts.
- f) Give the full form of GPS. What are the advantages of navigation system based on satellite?
- g) What is path loss? Calculate downlink path loss for the satellite located 37000 km far from the earth station and operating 3,950 GHz frequency.
- h) What do you mean by TDM? How it can be used in case of pulse modulation?
3. Answer any **two** questions: $5 \times 2 = 10$
- a) Explain the generation of an amplitude modulated wave with proper labelled circuit diagram. $3+2$
- b) What do you mean by noise in electronic communication? Mention different types of Noise in the communication system on the basis of their source in the communication channel. Define Signal to Noise ratio. Define figure of merit in connection with noise of electronic communication system. $1+2+1+1$
- c) What is transponder? With a proper block diagram explain its' function. $1+4$
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