



**WEST BENGAL STATE UNIVERSITY**

B.Sc. Honours 6th Semester Examination, 2022

**ELSACOR13T-(CC13)**

**ELECTRONICS**

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.  
Candidates should answer in their own words and adhere to the word limit as practicable.  
All symbols are of usual significance.*

**GROUP-A**

**Answer any *five* questions from the following**

**2×5 = 10**

1. What is a channel in communication system? Give two examples.
2. Define modulation index. How it can be measured in amplitude modulation?
3. In a typical communication system, the SNR at the input and output are 5:2 and 5:4 respectively. Compute Noise Figure of the system.
4. State the main advantage and disadvantage of low level modulation.
5. “FM and PM are not only very similar but are inseparable.” — Discuss.
6. In frequency modulation, if the frequency of the modulating voltage is doubled, compute the change in the ‘rate of deviation of carrier’ frequency.
7. What is Nyquist rate? State sampling theorem in this regard.
8. In a PCM system, signal is sampled at a rate of  $fs$  and number of pulses in one code group is  $p$ . Compute the number of pulses per second.

**GROUP-B**

**Answer any *six* questions from the following**

**5×6 = 30**

9. (a) Distinguish between DSBSC and DSBTC in amplitude modulation with proper diagram. **3+2**  
(b) How rectifier detection method is used for amplitude demodulation?

10. Describe the operation of PLL as FM demodulator with neat diagram and relevant waveforms.
11. What is Bit rate? What is Baud Rate? What is M-ary coding? What is the main advantage of the M-ary coding? 1+1+2+1
12. A certain transmitter radiates 9 kW with the carrier unmodulated and 10.125 kW when the carrier is sinusoidally modulated. Calculate the modulation index. If another sine wave corresponding to 40% modulation is transmitted simultaneously, determine the total radiated power. 5
13. Describe PCM technique with diagram and relevant waveforms.
14. Write short notes on ASK or FSK with relevant diagram and waveforms.
15. Write short notes on PAM or PPM.
16. Bandwidth of the input to a pulse code modulator is restricted to 4 kHz. The signal varies from  $-3.8$  V to  $+3.8$  V and has the average power of 30 MW. The required signal to - quantization noise power ratio is 20 dB. The modulator produces binary output.  
(a) Find the number of bits required per sec.  
(b) Output of 30 such PCM codes are time multiplexed. What is the minimum required transmission bandwidth for the multiplexed signal?
17. Explain the working of a diode detector with the help of a circuit diagram.

**N.B. :** *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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