Write the following information in the first page of Answer Script before starting answer

ODD SEMESTER EXAMINATION: 2020-21

Exam ID Number_____

Course_____   Semester_____

Paper Code_____Paper Title_____

Type of Exam: _____ (Regular/Back/Improvement)

__Important Instruction for students:__

1. Student should write objective and descriptive answer on plain white paper.
2. Give page number in each page starting from 1st page.
3. After completion of examination, Scan all pages, convert into a single PDF, rename the file with Class Roll No. (2019MBA15) and upload to the Google classroom as attachment.
4. Exam timing from 10am – 1pm (for morning shift).
5. Question Paper will be uploaded before 10 mins from the schedule time.
6. Additional 20 mins time will be given for scanning and uploading the single PDF file.
7. Student will be marked as ABSENT if failed to upload the PDF answer script due to any reason.

M.Sc. ELECTRONICS
THIRD SEMESTER
ELECTRONICS COMMUNICATION SYSTEM
MSE - 302

Duration : 3 hrs.   **Full Marks : 70**

(__PART-A: Objective__)

Time : 20 min.   **Marks : 20**

Choose the correct answer from the following: *1×20=20*

1. When the signal amplitude is equal to carrier amplitude, modulation index will be
   a. 50%   b. 100%
   c. 200%   d. 1%

2. If m>1, the carrier wave is
   a. Over-modulated   b. Under-modulated
   c. Both (A) & (B)   d. None of the above

3. The device which converts Analog signal into Digital signal is called
   a. ADC   b. DAC
   c. TRIAC   d. MPEG

4. In AM wave, only ------- of the total power is available in two side bands.
   a. 2/3   b. 1/3
   c. 3/3   d. None of the above

5. Fading does not exist in
   a. AM(DSBFC)   b. DSBSC
   c. SSB   d. All of the above

6. According to sampling theorem,
   a. $T_s \geq 1/2f_m$ b. $T_s \leq 1/2f_m$
   c. $T_s = 1/2f_m$ d. None of the above

7. Nyquist rate is defined by
   a. $T_s \geq 1/2f_m$ **b.** $T_s \leq 1/2f_m$
   c. $T_s = 1/2f_m$ **d.** None of the Above

8. The component in communication system that converts information into electrical signal is called
   a. Amplifier   b. Transmitter
   c. Transducer   d. All of the above

9. Telegraphy is an example of
   a. Line communication   **b.** Radio Communication
   c. Both (a) & (b)   **d.** None of the above

10. In delta modulation, ------ version of message signal is used.
   a. Oversampled   b. Undersampled
   c. Both (a) & (b)   d. None of the Above

11. The unit of entropy is
    a. Bytes/symbol
    b. Bits/symbol
    c. Bytes/message
    d. None of the above

12. Entropy is the measure of
    a. Total information content
    b. Average information content
    c. Both (a) & (b)
    d. None of the Above

13. If the probabilities of three symbols are $1/2, 1/4$ & $1/4$, then entropy of the source is
    a. 2.5
    b. 2.0
    c. 1.5
    d. 3

14. Shannon's theorem is used to find
    a. Efficiency of a system
    b. Capacity of a system
    c. Noise of a system
    d. None of the above

15. For a noisy channel with SNR=0, capacity will be
    a. Infinity
    b. Zero
    c. One
    d. None of the above

16. In a lossless channel matrix
    a. Sum in row is 1
    b. Sum in column is 1
    c. Sum in row is 0
    d. Sum in column is 0

17. The channel matrix which contains only one non zero element in each row is called
    a. Lossless channel
    b. Deterministic channel
    c. Noiseless channel
    d. None of the above

18. In a noiseless channel, if the number of column are 3 then the number of rows will be
    a. 2
    b. 3
    c. 4
    d. 1

19. In PDM, which of the following quantity is variable
    a. Width
    b. Amplitude
    c. Position
    d. None of the above

20. MPEG decoder decompress
    a. Digital audio
    b. Digital video
    c. Both (a) & (b)
    d. None of the above

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PART-B : Descriptive

Time: 2hr. 40min   Marks:50

[Answer question no.1 & any four (4) from the rest]

1. Explain with the help of diagram the digital TV transmitter and receiver circuit.   **10**

2. What is Shannon's theorem? Find the equation of frequency modulated wave.   **2+8=10**

3. **a.** What do you mean by modulation index? The maximum peak to peak voltage of an AM wave is 24 mV and the minimum peak to peak voltage is 8 mV. Calculate the modulation factor.   **5+5=10**

    b. Differentiate between DSBFC and DSBSC in AM system.

4. **a.** Define Entropy. Discuss mathematical analysis of Entropy.   **7+3=10**

    b. Find the Entropy of a source that emits one of the three possible symbols A,B&C independently with probabilities ½, ¼ & ¼ .

5. **a.** Write short notes on the followings: **6+4=10**
        (i)   Properties of Entropy (ii) Deterministic Channel

    b. What do you mean by Discrete memory-less channel? Explain with the help of Channel matrix.

6. **a.** Explain with the help of diagram the Delta Modulation technique.   **5+5=10**

    b. Write short notes on AM transmitter.

7. What is Sampling theorem? Discuss the different types of noise.   **2+8=10**

8. **a.** Differentiate between QAM and PAM wave.   **5+5=10**

    b. Write short notes on Frequency discrimination method.

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