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GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, May – 2021

(Eighth Semester)

BECOE 8031 – INTRODUCTION TO COMMUNICATION SYSTEM ENGINEERING

(CSE & I.T)

Time: 2 hrs Maximum: 50 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) **(1 x 10 = 10 Marks)**

Q.1. Answer ***ALL*** questions

a. The Fourier series of an odd periodic function contains only
   (i) Cosine terms (ii) Sine terms
   (iii) Even harmonics (iv) Odd harmonics

b. Find a_0 of the function $f(x)=1/4((\pi-x)^2)$.
   (i) $\pi^2/6$ (ii) $\pi^2/1$
   (iii) $\pi^2/4$ (iv) $\pi^2/8$

c. The condition for AM in which the sidebands do not overlap
   (i) $-f_c$ (ii) $f_c - W$
   (iii) $f_c > W$ (v) $f_c < W$

d. The function of amplitude limiter in FM system
   (i) is used to remove amplitude variations by clipping the modulated wave at the filter output almost to the zero axis (ii) is to limit the FM signal output
   (iii) is to reduce the amplitude level at the FM output (iv) is to increase the amplitude level at the FM output

e. What are the disadvantages of using balanced slope detector for demodulation of FM signal?
   (i) The detector operates only for small deviation in frequency (ii) Low pass filter of the detector produces distortion in the detection
   (iii) Both (i) and (ii) (iv) none of the above

f. Disadvantages of FM over AM are
   (i) Prone to selective fading (ii) Capture effect
   (iii) Poorer signal to noise ratio at high audio frequencies (iv) All of the above

g. Multimode step index fiber has
   (i) Large core diameter & numerical aperture (ii) small core diameter & large numerical aperture
   (iii) Large core diameter & small numerical aperture (iv) small core diameter & numerical aperture

h. The range of core diameter of Multimode step index fiber is
   (i) 100 to 300 nm (ii) 100 to 300 μm
   (iii) 200 to 300 nm (iv) 300 to 400 μm

i. The combination of transmitter and receiver in a satellite is known as
   (i) repeaters (ii) earth station

(iv) transponders (v) duplexer

j. Which is utilized to allow synchronization of the receivers between different slots and frames

(i) preamble (ii)data

(ii) trial bits (iv) guard times

PART – B: (Short Answer Questions) **(2 x 5 = 10 Marks)**

Q.2. Answer ***ALL*** questions

a. What is a notch filter?

b. What will happen if we increase the sample size? Calculate the minimum sampling rate to avoid aliasing when a continuous time signal is given by $x(t) = 5 \cos 400\pi t$.

c. How a PAM signal can be detected? Whether it requires a synchronizing signal?

d. Define AM broadcasting.

e. What is the job of a channel in a communication system?

PART – C: (Long Answer Questions) **(6 x 5 = 30 Marks)**

Answer ***ANY FIVE*** questions Marks

3. Draw and explain the basic communication system. (6)

4. Write a brief note on bandlimited signals. (6)

5. Explain the characteristics and features of demodulation of FM signal with a neat diagram (6)

6. A 10KW carrier wave is amplitude modulated at 80% depth of modulation by a sinusoidal modulating signal. Calculate the sideband power, total power and the transmission efficiency of the AM wave. (6)

7. Write down the types of optical fibers and Explain the fiber optic communication system with a neat diagram.. (6)

8. Describe the concept behind radio broadcasting.. (6)

9. State and explain the Kepler's three laws of motion with suitable diagram (6)

10. Explain the principle behind CDMA with a diagram and mention any two advantages of CDMA for satellite networking . (6)

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