Duplicate

Sr. No.....

**May 2019**

**B.Tech ECE- 1V SEMESTER**

**Communication System (EC-210C)**

**Time: 3 Hours** **Max. Marks:75**

***Instructions:*** *1. It is compulsory to answer all the questions (1.5 marks each) of Part -A in short.*
*2. Answer any four questions from Part -B in detail.*
*3. Different sub-parts of a question are to be attempted adjacent to each other.*

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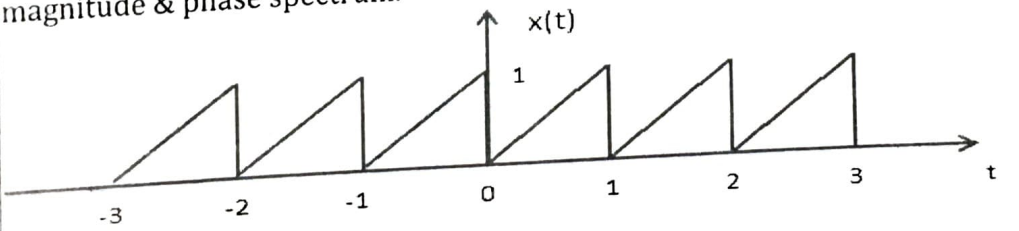
| | **Part – A** | | |
| Q1 | (a) State & prove superposition theorem for fourier transform. | (1.5) | CO1 |
| | (b) What is the need of modulation in communication system. | (1.5) | CO1 |
| | (c) Calculate power content of carrier & each of side band of AM signal whose total broadcast power is 60 kw when percent modulation is70%. | (1.5) | CO2 |
| | (d) Differentiate between VSB & SSB system of amplitude modulation. | (1.5) | CO2 |
| | (e) What is nonlinear modulation. | (1.5) | CO2 |
| | (f) What is aliasing & how it can reduced. | (1.5) | CO3 |
| | (g) What is necessity of non-uniform quantization | (1.5) | CO3 |
| | (h) What is relation between noise figure & equivalent noise temperature. | (1.5) | CO5 |
| | (i) Differentiate between coherent & non coherent detection. | (1.5) | CO4 |
| | (j) An angle modulated signal is given below. Identify whether it is FM or PM signal $x_c(t)= 5 \cos [2\pi(10^6) t + 0.2\pi t]$ | (1.5) | CO2 |
| | **Part – B** | | |
| Q2 | (a) Find the exponential fourier series for following impulse train. Also find magnitude & phase spectrum.   | (7) | CO1 |
| | (b) Find the fourier transform of a periodic train of triangular pulse with period T & base width of 2ζ & amplitude A. | (8) | CO1 |
| Q3 | (a) Explain collector modulation method for AM generation with mathematical analysis. | (7) | CO2 |
| | (b) A received single tone sinusoidally modulated SSB-SC signal $\cos(\omega_c+\omega_m)t$ has a normalized power of 0.5 volt$^2$. The signal is to be detected by carrier reinsertion technique. Find the amplitude of carrier to be reinserted so that the power in the recovered signal at the demodulator output is 90% of the normalized power. The dc component can be neglected | (8) | CO2 |

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| Q4 | (a) In a tone-modulated angle modulation , the modulated signal $x_c(t)$ is given<br>$x_c(t) = A \cos(\omega_c t + \beta\omega_m t)$ . When $\beta << 1$ , we have narrow band angle modulation.<br>i) Determine spectrum of narrow band angle modulated signal<br>ii) Compare results with the tone modulated AM signal.<br>iii) Find the similarities & difference by drawing their phasor representation | (8) | CO2 |
| | (b) Draw the circuit diagram of varactor diode modulator & explain its working. | (7) | CO2 |
| Q5 | (a) i)Plot the law compression characteristic for $\mu$ = 255<br>ii)If $m_p$ =20 V and 256 quantizing levels are employed, what is the voltage between the levels when there is no compression.<br>For $\mu$ = 255, what is the smallest and largest effective separation between levels | (8) | CO3 |
| | (b) Explain delta modulation in detail with suitable diagram. Also explain ADM & compare its performance withDM. | (7) | CO3 |
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| Q6 | (a) What is noise figure. Derive the mathematical equation to calculate noise figure. | (8) | CO5 |
| | (b) Explain generation & detection of BFSK waveform with help of suitable block diagram & waveform. | (7) | CO4 |
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| Q7 | Write short note on following<br>i) FDM<br>ii)M-ary PSK<br>iii)Sampling theorem | (5*3=15) | CO3<br>CO4<br>CO3 |
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