

Unit - V

- What is geosynchronous satellite system?
- Discuss the antenna requirements for large and small earth stations.
- Discuss the classification of an earth station on the basis of the variety of equipments required.
- Describe satellite space craft system. How attitude control is maintained in space system antenna.

OR

A satellite downlink at 12 GHz operates with a transmit power of 6W and an antenna gain of 48.2 db calculate the EIRP in dBW.

Total No. of Questions : 5] [Total No. of Printed Pages : 4

EX - 601**B.E. VI Semester**

Examination, December 2015

Communication Engineering*Time : Three Hours**Maximum Marks : 70*

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
 ii) All parts of each questions are to be attempted at one place.
 iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.
 iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

- What do you understand by deterministic and random signal?
 - Discriminate between energy signals and power signals.
 - Obtain frequency domain representation of $e^{-at}u(t)$. Draw its waveforms.
 - Find Fourier transform of periodic gate function. The Fourier series for this function is given by

$$f(t) = \frac{A\delta}{T} \sum_{n=-a}^{\infty} S.a \left(\frac{n\pi\delta}{T} \right) e^{jn\omega t}$$

δ is width of gate function

[2]

$Sa(x)$ is the sampling function

Other symbol has usual meaning

OR

Evaluate the inverse Fourier transform of $Sa^2(Wt)$ by using time convolution theorem. Evaluate the convolution integral graphically.

Unit - II

- What is DSB-SC system? Mention its advantages.
- What do you understand by vestigial sideband transmission? Where it is being used?
- Draw the phasor diagram of FM signal. Discuss any method of FM generation.
- A distorted form of a sinusoidal wave $\cos^3 \omega_c t$ is available. To obtain DSB-SC signal a modulating signal $f(t)$ is multiplied by this distorted carrier waveform. Find and sketch the spectrum of the product $f(t) \cos^3 \omega_c t$. How can the desired modulating signal $f(t) \cos \omega_c t$ be obtained from this product?

OR

Explain qualitatively what will happen if an envelope detector is used to demodulate a DSB-SC signal.

Unit - III

- Draw the block diagram of superheterodyne receiver. How is it different from straight receiver.

[3]

- What is the purpose of RF amplifier in radio receiver?
- Draw the circuit of FM discriminator and explain its working.
- A 100 MHz carrier is frequency modulated by a sinusoidal signal of 10kHz so that the maximum frequency deviation is 1MHz. Determine the approximate bandwidth of the FM carrier.

OR

A carrier of 10MHz is phase modulated by a sinusoidal signal of 10kHz and unit amplitude and the maximum phase deviation is two radians. Calculate the bandwidth of the PM carrier.

Unit - IV

- What is instantaneous sampling?
 - Mention advantages of flat top sampling.
 - A signal $f(t)$ is band limited to f_m Hz. It is sampled using triangular pulse of time T less than its time period T and amplitude is unity. Sketch spectrum of sampled version.
 - For following band limited signal find minimum sampling rate.
 - $e^{-2t} \cos 100t u(t)$
 - $t \cdot e^{-t} u(t)$

OR

Describe PSK, FSK and QPSK with required waveforms.