

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2064)

14638

B. Tech 4th Semester Examination

Communication System-I (N.S.)

EC-221

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

- Note :** (i) The question paper will consists of five sections A, B, C D and E. Section E will be compulsory, of short answer type. Section A, B, C, D will have two questions from and each question will carry 20 marks.
- (ii) Candidates are required to attempt five questions in all selecting one question from each section of A, B, C and D of the question paper and all the subparts of the question in section E. Use of non-programmable calculators is allowed.

SECTION - A

1. (a) Draw a block diagram of communication systems and explain the function of each block.
- (b) Draw the block diagram for a PLL FM transmitter and describe its operation.
2. (a) Draw the block diagram of AM transmitter and explain function of each block.

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- (b) When super heterodyne receiver is tuned to 555kHz, its local oscillator provides the mixer with an input at 1010kHz. What is the image frequency? The antenna of this receiver is connected to the mixer via a tuned circuit whose loaded Q is 40. What will be the rejection ratio for calculated image frequency? (20×1=20)

SECTION - B

3. Consider a wideband PM signal produced by a sinusoidal modulating wave $A_m \cos(2\pi f_m t)$ using a modulator with a phase sensitivity equal to k_p radians per volt. Show that if the maximum phase deviation of the PM signal is large compared with one radian, the bandwidth of the PM signal varies linearly with the modulation frequency f_m .
4. (a) What are the advantages and disadvantages of AM over FM?
(b) Draw the Foster-Seeley discriminator and explain. (20×1=20)

SECTION - C

5. (a) Explain the features of Pulse Amplitude Modulation.
(b) What are the advantages of SSB transmission?
6. (a) An analog waveform, $w(t)$ is converted into flat-topped PAM signal using a sampling rate 8 kHz and a pulse width of $100\mu s$. Assume that $w(f) = 2A(f/B)$, where $B = 3$ kHz. Find a value for the first null-bandwidth of the PAM signal.
(b) Explain the operation of pulse position modulation and draw the waveforms. (20×1=20)

SECTION - D

7. Explain briefly about Electronic Telephones with neat diagram.
8. Explain the telephone circuit and public telephone network. (20×1=20)

SECTION - E

9. (i) What is Amplitude Modulation?
- (ii) What is simple automatic gain control? What are its functions?
- (iii) Explain the generation FM wave using varactor diode.
- (iv) Write about limiter used in FM receiver.
- (v) Explain in detail about pre-emphasis and de-emphasis.
- (vi) Explain the features of pulse width modulation.
- (vii) Give and explain 3 areas of applications where standard FM transmission is needed.
- (viii) Explain paging system in telephone system.
- (ix) Explain how DTMF is used in telephone system.
- (x) Explain the method of basic call procedures in telephone systems. (2×10=20)