

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

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B. Tech 4th Semester Examination

Communication Engineering (O.S.)

EE-4006

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 : Attempt five questions in all: selecting one question from each of the sections A, B, C and D. All parts of Section E are compulsory. Use of non-programmable calculators is allowed.

SECTION - A

1. Mention the special features of the various frequency bands used for communication engineering. Why is modulation needed in communication systems? Classify various modulation techniques used in communication engineering. (5+10+5=20)
2. Explain mathematically AM giving appropriate figures and examples. Give main advantages of AM over FM systems. Determine the percentage saving in power if single side band transmission is used over the double side band full carrier AM at 50% modulation. (10+5+5=20)

SECTION - B

3. Give schematic block diagrams for AM transmitter and Superheterodyne AM receiver circuits. Explain the working of an AM modulator with circuit diagram. (10+10)

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4. What is image frequency in AM receiver systems and how is it rejected? A transmitter radiates 10kW modulating power when carrier power of 9kW is modulated by a sine voltage. Determine the modulation index. If another sine wave modulates the same carrier simultaneously to a depth of 50% determine the total radiated power. (10+10=20)

SECTION - C

5. What are direct methods for FM generation? How is frequency stabilized in FM transmitters? Explain the working of Foster Seely Phase discriminator circuit. (5+5+10=20)
6. Give block diagram of Armstrong FM system, explaining function of each block. Why is frequency mixing required in a communication system? (15+5=20)

SECTION - D

7. What is PCM and how is it attained, describe with an appropriate block diagram? Specify function of each part of the block diagram. (20)
8. Explain how noise affects the analog modulation systems? How is analog to digital conversion done? (10+10=20)

SECTION - E

9. Give very short answers: (2×10=20)
- (i) What is the significance of AM in communication engineering?
 - (ii) Enlist main characteristics of FM receivers.
 - (iii) What are pre-emphasis and de-emphasis?
 - (iv) Draw block diagrams of typical AM and FM receivers.

- (v) Give relationships for AM and FM system bandwidths. Hence specify their ideal values. What is the bandwidth required for an AM signal having a modulating frequency of 2kHz and carrier of 50kHz?
- (vi) What is sampling?
- (vii) What are AM and FM frequency ranges?
- (viii) Compare narrow band and wide band FM systems.
- (ix) Ideally how many sidebands are there in AM and FM systems?
- (x) What is quantization?