[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2063)

838

B.Tech 4th Semester Examination

Communication Engineering

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. Section E is compulsory. Use of non-programmable calculators is allowed.

SECTION - A

1. Enumerate the special features of the various frequency bands used for communication engineering. State sampling theorem and give its significance. Compare and contrast analog and digital modulation techniques. **(5+5+10)**

2. Explain mathematically FM giving appropriate figures and examples. Specify main advantages of AM over FM. Determine the bandwidth required for an FM signal having a modulating frequency of 3.6kHz and maximum deviation of 28.8kHz. **(10+5+5)**

SECTION - B

3. Draw neat block diagrams of AM transmitter and Super-heterodyne receiver circuits. Explain the working of a collector class C modulator with circuit diagram. **(10+10)**

4. What is image frequency in AM receiver systems? How is AGC achieved in AM receivers? For an AM receiver with no RF section, the loaded quality factor of the antenna coupled circuit is 112. The intermediate frequency is 455kHz. Determine the image frequency and thereafter find the rejection ratio in dB at 1MHz. **(5+5+10)**

SECTION - C

5. What are direct methods for FM generation? Hence explain varactor diode method for FM generation? How is frequency stabilized in FM transmitters? **(5+10+5)**

6. Enumerate various types of reactance modulators, specifying their impedance, operation conditions and reactance relationships. Hence explain transistor reactance modulator. **(10+10)**

SECTION - D

7. What is PCM? Show how PCM is obtained with an appropriate block diagram, explaining each part of the block diagram. **(5+15)**

8. Explain how noise affects the analog and the digital modulation systems? How is an analog signal converted into a digital signal? **(10+10)**

SECTION - E

9. Give short answers:

   (i) What is modulation?

   (ii) Where are VSB communication systems used?

(iii) Draw the frequency spectrum of AM and FM systems.

(iv) What are low level and high level modulations?

(v) Name different types of interferences encountered in radio receivers.

(vi) Explain de-emphasis with a diagram.

(vii) Specify differences between AM and FM receivers.

(viii) Name various digital modulation techniques and where is each one used?

(ix) What is flat top sampling?

(x) Enlist various FM generation methods. **(10×2)**