Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH(EE)/SEP.SUPPLE/SEM-8/EE-802A/2012

2012

COMMUNICATION ENGINEERING

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

   i) A signal $g(t)$ delayed by t seconds is represented by

   a) $g(t-T)$ b) $g(t+T)$

   c) $g(T-t)$ d) none of these.

   ii) Bandwidth requirement for theoretical FM is

   a) 106·2 MHz b) 92·7 MHz

   c) 98·3 MHz d) infinity.

   iii) The intermediate frequency used for a superheterodyne AM receiver is

   a) 545 kHz b) 455 kHz

   c) 815 kHz d) 650 kHz.

iv) The modulation index of FM is given by

a) $\frac{\delta}{fm}$ b) $\frac{fm}{\delta}$

c) δfm d) none of these.

v) SSB signal can be detected by

a) Envelope detector

b) PLL

c) Synchronous detector

d) Foster Seely discriminator.

vi) The Nyquist sampling rate for a signal band limited to 4 kHz is

a) 4 kHz b) 8 kHz

c) 2 kHz d) 32 kHz.

vii) Recovering information from a carrier is known as

a) demultiplexing b) modulation

c) detection d) carrier recovery.

viii) The sound channel used in TV system is

a) AM b) FM

c) PM d) SSB.

ix) Quantization noise occurs in

a) TDM b) FDM

c) PCM d) PPM.

x) Which one of the following is a digital modulation ?

a) VSB b) FSK

c) PWM d) PAM.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. How can a balanced modulator be used to generate a DSB-SC signal ?
3. Explain with sketch the difference between PWM, PAM and PPM.
4. Why are FM and PM called inseparable ?
5. What is the function of MODEM ? Explain.
6. i) What is Apogee ?
   ii) What is azimuth angle ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) Draw the block diagram of a simple superheterodyne AM receiver and explain its principle of operation.
   b) What is image frequency ? Find out the value of image frequency for an input signal of 1000 kHz to an AM superheterodyne receiver. 10 + 5
8. a) Discuss the relative advantages and disadvantages of Digital Communication System over Analog Communication System.
   b) Give the block diagram of generation and detection process of a PCM and explain its various blocks. 5 + 10
9. a) Explain the principle of detection of FM signal using balanced slope detector circuit with proper diagram.
   b) What is Carson's rule ? 11 + 4

10. a) State and explain Shanon's channel capacity theorem.

    b) Draw the block diagram of a Satellite Communication system & explain.

    c) What do you mean by uplink and downlink satellite system ? (2 + 4) + 6 + 3

11. Write short notes on any *three* of the following :

    a) A to D converter

    b) Balanced Modulator

    c) TDM and FDM systems

    d) Ring Modulator.

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