



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. $3 \times 5 = 15$

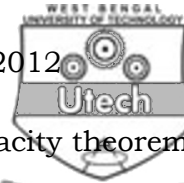
2. How can a balanced modulator be used to generate a DSB-SC signal ?
3. Explain with sketch the difference between PWM, PAM and PPM.
4. Why are FM and PM called inseparable ?
5. What is the function of MODEM ? Explain.
6. i) What is Apogee ?
ii) What is azimuth angle ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

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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