



Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech (CSE & IT-OLD)/SEM-4/EC-411/2013

2013

PRINCIPLE OF 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 any *ten* of the following : 10 × 1 = 10

i) The modulating technique which is most affected by noise is

- a) PSK
- b) ASK
- c) DPSK
- d) FSK.

ii) Recording information from a carrier is known as

- a) demultiplexing
- b) carrier recovery
- c) modulation
- d) detection.



xiii) The channel capacity of a 5 kHz bandwidth binary system is

- a) 10,000 bits/sec
- b) 5,000 bits/sec
- c) 8,000 bits/sec
- d) 4,000 bits/sec.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

- 2. a) What is Nyquist interval ?
b) What is folding frequency ?
c) Which kind of filter is used to demodulate a PAM signal ?
- 3. a) What is apogee ?
b) Define Azimuth angle.
- 4. a) What is the difference between geosynchronous and geostationary orbit ?
b) Discuss the disadvantages of geostationary orbit.
- 5. a) What is regenerative repeater ?
b) Explain the eye-pattern with proper diagram.



6. For the binary sequence 10110010, draw the following signaling formats :

- a) Unipolar RZ
- b) Polar NRZ
- c) AMI.

GROUP – C

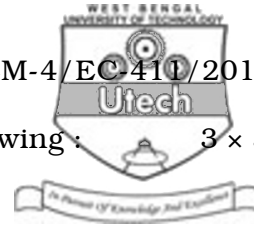
(Long Answer Type Questions)

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

7. a) The output voltage of a transmitter is given by $500 (1 + 0.4 \sin 3140 t) \cos 6.28 \times 10^7 t$. This voltage is fed to a load of 6000Ω . Determine
- i) carrier frequency
 - ii) modulating frequency
 - iii) carrier power. 8
- b) Explain the detail about the superheterodyne receiver. 7



8. a) A carrier is frequency modulated with a sinusoidal signal of 2 kHz resulting in a maximum frequency deviation of 5 kHz. Find
- i) modulation index
 - ii) bandwidth of modulating signal. 5
- b) Explain the method of generating FM signal using indirect method. 10
9. a) Explain coherent QPSK system. 10
- b) What is DPSK ? What is the bandwidth requirement of DPSK ? 5
10. a) 1 kHz signal is sampled by 8 kHz sampling signal and the samples are encoded with 12 bit PCM system. Find
- i) required bandwidth
 - ii) total no. of bits in the digital output signal in 10 cycles.
- b) With a suitable block diagram explain the principle of pulse code modulation (PCM).
- c) What is companding ? Discuss the two laws of companding.



11. Write shorts notes on any *three* of the following : 3 × 5

- a) TDM
 - b) ISI
 - c) ARQ
 - d) D/A converter.
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