



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/B.Tech (ECE-OLD)/SEM-4/EC-403/2013**

**2013**

**ANALOG COMMUNICATION**

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.*

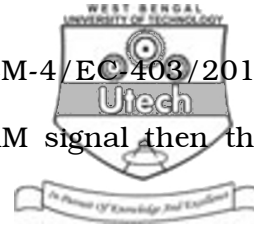
**GROUP – A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for any *ten* of the  
following :  $10 \times 1 = 10$

- i) The bandwidth required for transmission of SSB-SC signal is
  - a) more than AM signal
  - b) less than DSB-SC signal
  - c) more than VSB signal
  - d) none of these.
- ii) If frequency for superheterodyne commercially available AM receivers is
  - a) 460 kHz
  - b) 500 kHz
  - c) 455 kHz
  - d) 355 kHz.
- iii) Balance modulator circuit is used to reject
  - a) Carrier
  - b) LSB
  - c) USB
  - d) LSB and USB.





xii) If  $W_C$  be the carrier frequency of AM signal then the sideband frequencies are

- a)  $W_C + W_m, W_C - W_m$
- b)  $W_C + W_m/2, W_C - W_m/2$
- c)  $W_C^2 + W_m^2, W_C^2 - W_m^2$
- d)  $W_C^2 + W_m^2/2, W_C^2 - W_m^2/2$ .

### GROUP – B

#### ( Short Answer Type Questions )

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

2. a) State and prove Parseval's theorem. 3 + 5 = 15
- b) Draw the block diagram of a basic analog communication system. 2 + 3
3. What is angle modulation ? Justify that frequency modulation is an angle modulation.
4. What is balanced modulator ? Describe it. 2 + 3
5. What are PWM and PPM ? Compare the performance of the two signals. 2 + 3
6. Show that PLL acts as a FM demodulator.
7. What do you mean by TDM ? Where is the concept used ? 3 + 2

### GROUP – C

#### ( Long Answer Type Questions )

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

8. a) Write the Dirichlet's conditions for Fourier series.
- b) Write the trigonometric form of the Fourier series representation of a periodic signal.
- c) Find out the maximum limit of transmission efficiency of an AM signal. 6 + 3 + 6



9. a) Draw the block of a superheterodyne receiver & explain its working principle.
- b) What is image frequency related to it ?
- c) Explain the selectivity related to it.  $10 + 2 + 3$
10. a) Draw the schematic diagram of NBFM generation & explain.
- b) Explain the principle of FM wave generation using direct method. State the demerits of this method.
- c) Explain FDM with proper block diagram.  $5 + 5 + 5$
11. a) Discuss the method for modulation & demodulation of PAM signal.
- b) Compare PAM with PWM system of data transmission.
- c) A 10 MHz sinusoidal carrier wave of amplitude 10 mV is modulated by a 5 kHz sinusoidal audio signal wave of amplitude 6 mV. Find the frequency component of the resultant modulated wave and their amplitude.
- $6 + 5 + 4$
12. Write short notes on any *three* of the following :  $3 \times 5$
- a) VSB modulation.
- b) Envelope detector
- c) QAM system
- d) Stereophonic transmitter & receiver
- e) Pulse code modulation.