

Roll No .....

**IT-4004 (CBGS)****B.E. IV Semester**

Examination, May 2018

**Choice Based Grading System (CBGS)****Communication System****Time : Three Hours****Maximum Marks : 70**

- Note:** i) Total number of questions are eight.  
 ii) Attempt any five questions  
 iii) All questions carry equal marks.

1. a) Draw and explain following signals.
  - i) Sinusoidal
  - ii) Unit step
  - iii) Ramp
  - iv) Signum
  - v) Rectangular pulse
  - vi) Impulse (delta)
- b) Give a classification of transmission media and explain each class.
2. a) Draw electromagnetic spectrum and discuss the applications of different frequencies in our daily life.
- b) Draw a block diagram of communication system and explain it.
3. a) Write any five properties of Fourier Transform and explain any one in detail.
- b) Write conditions for existence of Fourier Transform and also write equations for inverse Fourier Transform.

4. a) What do you mean by convolution of two functions? Write and explain time and frequency convolution theorems.
- b) Prove the following relations
  - i)  $f(t) \otimes \delta(t-b) = f(t-b)$
  - ii)  $f(t-b) \otimes \delta(t-c) = f(t-b-c)$
5. a) Define modulation index for Amplitude Modulation. Describe over modulation and envelope distortion.
- b) A carrier  $A \cos \omega_c t$  is modulated by a single tone modulation signal  $f(t) = E_m \cos \omega_m t$ . Find
  - i) Total modulated power
  - ii) rms value of the modulated signal
  - iii) Transmission efficiency for a 100% modulation
6. a) Define DSB-SC and SSB-SC systems. How they differ from AM with full carrier systems?
- b) Draw block diagram of superheterodyne receiver and explain concept of Intermediate frequency.
7. a) Comment on frequency deviation, deviation ratio and Carson's rule.
- b) With the help of suitable diagrams explain direct and indirect methods of FM generation.
8. Write short notes on any two:
  - a) Foster seeley discriminator
  - b) VSB-SC system
  - c) PAM, PPM and PWM systems
  - d) TRF receiver

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