



Printed Pages : 4

TEN - 801

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0295

Roll No.

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B. Tech.

(SEM. VIII) EXAMINATION, 2007-08

ADVANCED COMMUNICATION SYSTEMS

[Time : 3 Hours]

[Total Marks : 100]

- Note :**
- (1) Attempt all questions.
 - (2) All questions carry equal marks.
 - (3) Be precise in your answer.
 - (4) No second answer book will be provided.

1 Attempt any **four** of the following : 5×4=20

- (a) Why the battery at the exchange is not directly connected across the lines in a Central Battery system? How is it actually done?
- (b) What is side tone? How is it of importance in telephone instrument? Describe a simple anti side tone circuit.
- (c) What is the advantage of cross-bar switching system over the step by step system? Explain in detail the step by step method.
- (d) Define the terms :
 - (i) Busy hour
 - (ii) Traffic units

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- (iii) Full availability
- (iv) Grade of service.
- (e) Explain the function of a line finder switch and a line selector switch in a step by step switching system.
- (f) What is private telephone network? Explain PBX and PABX.
- 2 Attempt any **four** of the following : **5×4=20**
- (a) Discuss and compare television and facsimile telegraphy as method of transmitting documentary information such as photographs.
- (b) Explain one form of facsimile transmitter in detail and discuss how the scanning spot is obtained.
- (c) What is the need of synchronization in television? How synchronization is achieved?
- (d) Draw the block diagram of a colour T.V. receiver sharing all the important functions from the tuner to the picture tube.
- (e) Explain the black and white T.V. transmitter with the help of block diagram.
- (f) In American T.V. systems, $N=525$ and $P=30$ frames per second. Calculate the horizontal sync frequency and the total line time.
- 3 Attempt any **two** of the following : **10×2=20**
- (a) Derive the Radar range equation in free space. Draw a functional block diagram of a pulse radar and describe the function of each block.



- (b) Explain in detail the MTI Radar. What is blind speed? Calculate the lowest three blind speed of MTI Radar which operates at 5 GHz, with a pulse repetition frequency of 800 pulse per second.
- (c) (i) Describe the basic principle of a cellular communication system. Explain how the fading medium affects the transmission.
- (ii) Explain and compare the FDMA, TDMA and CDMA techniques.

4 Attempt any **two** of the following : 10×2=20

- (a) Explain what is meant by saying that satellite is stationary. Why such satellites used for world wide communication? What are the important systems necessary in a geosynchronous satellite?
- (b) Calculate the Carrier to Noise density ratio in dB at the earth receiving station from a satellite transmitting an effective isotropic radiated power of 49.5 dBW on a frequency 12 GHz, the earth station antenna angle of elevation is 7°, and the receiving figure of merit is 40.7 dB?
- (c) What is a satellite link? What do you understand by delay, transponders, uplink, downlink frequency and multiple spot beam?

5 Attempt any **four** of the following : 5×4=20

- (a) What is the difference between step index fiber and graded index fiber? How does the ray of light propagate in a graded index fiber?



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- (b) Explain the following terms:
- (i) Normalized propagation constant
 - (ii) Mode field diameter.
- (c) Explain the losses caused by linear and non linear scattering in optical fiber.
- (d) Explain the basic detection process of photoconductive detectors and phototransistor.
- (e) Mention the types of possible structures for light emitting diode. Explain any one structure used for optical communication.
- (f) What are the advantages of a coherent optical communication system? Explain the principle of heterodyne detection used in optical systems.
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