

11. Pulse Code Modulation (PCM) is an example of
a. Analog to analog conversion b. Analog to digital conversion
c. Digital to analog conversion d. Digital to digital conversion
12. If basic rate interface has been adopted in ISDN, the maximum speed that could be enjoyed is
a. 64 Kbps b. 192 Kbps c. 1.54 Mbps d. 5 Mbps
13. Paging systems were based on
a. Simplex system b. Half duplex system
c. Duplex system d. Semi duplex system
14. The type of handoff used in CDMA system is
a. Soft handoff b. Hard handoff
c. Soft and hard handoff d. Vertical handoff
15. The technique that increases the system capacity by reducing co-channel interference is called
a. Cell-splitting b. Cell-Sectoring c. Relaying d. Power controlling
16. When registering for service with a mobile network operator, each subscriber receives a unique identification number also known as
a. IMEI b. IMSI c. MSIN d. PIN
17. In TV system, 720P means:
a. 720 vertical lines and 720 horizontal lines display progressively
b. 1280 vertical lines and 720 horizontal lines display progressively
c. 720 vertical lines and 1280 horizontal lines display progressively
d. 1920 vertical lines and 720 horizontal lines display progressively
18. The radar in which both transmission and reception is done using the same antenna is called
a. Monostatic radar b. Bistatic radar c. Bipole radar d. Dipole radar
19. In satellite system, transponder is a part of
a. Passive satellite b. Active satellite c. Earth station d. Uplink center
20. GPS is based on a principle called
a. Arbitration b. Orbiteration c. Trilateration d. Triangulation

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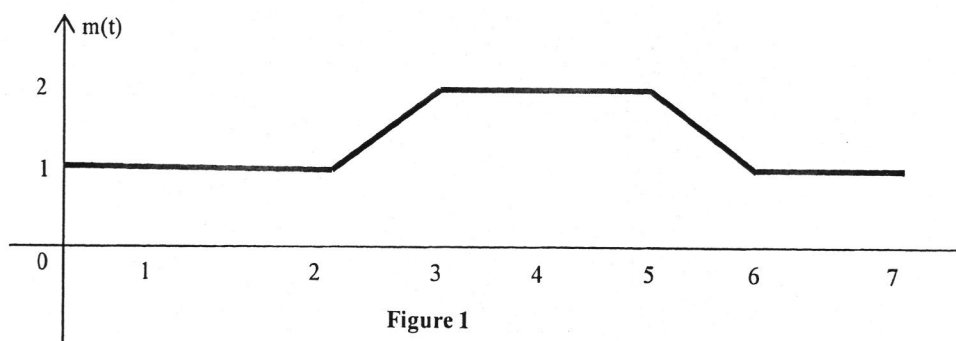
Level : B.E.
Year : III
Time : 2 hrs. 30 mins.

Course : ETEG 301
Semester : II
F. M. : 55

SECTION "B"

Attempt *ANY FIVE* questions. Each question carries 11 marks. Symbols have their usual meanings. Urgent appropriate assumptions are permissible. Marks are indicated inside brackets.

1. a. List the advantages of optical fiber communication over copper wire. [2]
b. What is acoustic transmission and what are the unique challenges that it faces in comparison to microwave transmission? [3]
c. Explain why throughput, energy, and fairness are considered as important performance matrices in any wireless communication system? [3]
d. Write at least one application of (a) Time shifting (b) Time scaling, and (c) Time reversal operations commonly used in signal processing. [3]
2. a. What do you mean by modulation and demodulation? [2]
b. Write any three advantages of modulation technique with appropriate example? [3]
c. If $A+m(t)$ is modulating signal in AM, the size of A affects the time domain envelop of the modulated signal and hence should always be chosen in such a way that $|A+m(t)| > 0$, Why? [3]
d. For the signal $m(t)$ in **Figure 1**, sketch both AM and FM signals by assuming a carrier signal frequency of your own. [3]



3. a. What is network topology? [2]
b. Suppose you have to set up new networks in your office but by taking into consideration the following two cases. In first you should guarantee the packet delivery at any cost and time while in second only cost matters but not any other issues; now suggest the network topology that you think best fits each case and then explain why do you think so? [3]
c. Why do you think the indoor propagation model is different than the outdoor propagation model? [3]
d. Based upon directionality compare omnidirectional and directional antennas. Also, write some benefits of using directional antennas. [3]

4. a. What do you mean by frequency reuse in cellular communication? [2]
b. If total of 66 MHz of bandwidth is allocated to a cellular system that uses 50 KHz duplex channels, find the number of channels available per cell if a system has cluster size of 12 (i.e. $N=12$). [3]
c. What is IMEI and what significant role does it play in cellular communication sector? [3]
d. Write any three advantages of CDMA in comparison to TDMA/FDMA system. [3]
5. a. Write benefits of MMS service in comparison to SMS service. [2]
b. Nationwide compatibility was listed as one of the fundamental requirements of cellular communication system during its development; now explain why do you think the developer marked this requirement as the important one? [3]
c. What are the fundamental differences between HDTV and ordinary TV system? [3]
d. From November 2017, analogue cable TV viewers are mandatorily required to switch to digital system using Set-Top box in Nepal. Why do you think the Government is being strict to implement this plan? Present your view. [3]
6. a. What do you mean by active satellite and passive satellite? [2]
b. Sketch the block diagram of monostatic radar system and explain how does it work? [3]
c. With appropriate diagram, illustrate how a GPS receiver determines its location? [3]
d. What do you mean by Power Line Communication (PLC)? What significant role does the device like *PLC modem* and *Coupling* play in PLC? [3]