

7E4046**7E4046**

B.Tech.VII Semester (Main/Back) Examination - 2013
Electronics & Comm.
7EC3 Wireless Communications

Time : 3 Hours**Maximum Marks : 80**
Min. Passing Marks : 24**Instructions to Candidates:**

Attempt any **five** questions, selecting **one** question from each **unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)

Unit - I

1. a) Explain the DSSS with binary phase shift keying and compare its performance with FHSS. (8)
- b) Consider an FHSS system in which the input data rate is 200bps. The modulation scheme is used to generate the modulation symbol is 32-ary FSK. The frequency hopping rate is 200 hops per second. Calculate
- Minimum separation between frequency tones
 - Processing gain
 - Hopping bandwidth
- Assume a frequency multiplication factor $k=1$. (8)

OR

1. a) If the chip rate of a DSSS transmitter is 20 Mcps, the message bit rate is 10 kbps. Find out the processing gain achieved, if bpsk is used. (6)
- b) Write the properties of P-N sequence (3)
- c) Explain small scale fading and write the Time dispersion parameters. (7)

Unit - II

2. a) Define the phenomenon diffraction with Fresnel zone geometry and find the radius of n^{th} zone. (10)

Unit - V

5. a) Explain the AOCS and TTC with suitable diagrams for a satellite (12)
b) Briefly explain the up conversion and down conversion methods (4)

OR

5. a) Consider a satellite transmitting 25 watts at frequency of 4 GHz via an antenna of 18 dB gain. An earth station in the network uses an antenna of 12m diameter with an efficiencies of 65% determine rtuonline.com
- i) Gain of earth station
 - ii) The path loss.
 - iii) The flux density at the earth station assuming the satellite earth station range to be 40,000 km.
 - iv) The power received at the op of the earth station antenna. (10)
- b) Briefly explain the properties of GEO satellites (6)
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- b) Assume a receiver is located 20 km from a 100W transmitter. The carrier frequency is 1000MHz free space propagation is assumed, $G_y=1$ and $G_r=3$. Find the power at receiver. (6)

OR

2. a) If 100W is applied to a unit gain antenna with a 600 MHz frequency (carrier), find the receiver power in dBm at a free space distance of 200m from the antenna. What is $p_r(10km)$? Assume unity gain for the receiver antenna (10)
- b) Explain free space loss and calculate it at 4GHz for the shortest path to a synchronous satellite from earth(35,863 Km) (6)

Unit - III

3. a) Explain the CDMA principle of operation with its advantages and disadvantages which type of Handoff's are occurs in CDMA mobile systems (10)
- b) Briefly explain the Near far problem in both uplink and downlink of CDMA (6)

OR

3. (a) If a normal GSM time slot consists of 6 trailing bits, 8.25 guard bits, 26 training bits and 2 traffic bursts of 61 bits of data find the frame efficiency(6)
- (b) Explain the TDMA principle of operation with TDMA/TDD example also write its advantages and disadvantages and efficiency (8)
- (c) Compare FDMA with TDMA. (2)

Unit - IV

4. a) How the capacity of a cellular system can be increased? Explain the interference in cellular systems. (10)
- b) A cellular service provider decide touse TDMA scheme that can tolerate a S/I of 16dB in worst case. Find the optimum value of Cluster size 'N' in case of 120° sectoring assume path loss exponent $n=4$ (6)

OR

4. (a) Explain the operation of DECT with is network architecture (8)
- (b) Briefly explain the process of speech coding in GSM (4)
- (c) Define the Handoff or Handovers in GSM (4)