M18002044

Registration No: | | | | | | | | | | |

Total Number of Pages : 02 **M.TECH**

M.TECH 2ND SEMESTER REGULAR EXAMINATIONS, MAY 2018
ADVANCED WIRELESS & MOBILE TECHNOLOGY
Branch: EC, Subject Code:MECPC2020
Time: 3 Hours
Max Marks : 70

PART-A (10 X 2=20 MARKS)

1. Answer the following questions.

a) What is the role of GPRS in enhancing 2G GSM system? **(CO2)**

b) What is shadow effect? What type of distribution is used to represent the shadow effect? **(CO1)**

c) Define coherence time. How can be the channel characterize with respect to coherence time? **(CO2)**

d) Calculate the reduction in the transmit power in dB when the radius of the new cell becomes of that the old cell assuming path loss exponent K=4. **(CO3)**

e) The total coverage area of a cellular system is 262.4 km^2 and cell radius is 1km. What is the system capacity for N=4 if there are total 1000 duplex channels? **(CO4)**

f) Define spectral efficiency. What is the spectral efficiency of a mobile phone system where there are 395 channels of 30 kHz each in a bandwidth of 12.5 MHz? **(CO3)**

g) What are the requirements for a Direct Sequence Spread Spectrum? **(CO2)**

h) Explain the role(s) of frequency synthesizer in frequency hopping spread spectrum. **(CO1)**

i) Write down the property of MSK. **(CO4)**

j) Prove $D=\sqrt{3}NR$ **(CO3)**

PART-B (5 X 10=50 MARKS)

Answer any five questions from the following.

2.a) Calculate the minimum power received by a receiver situated 3 Km from the transmitter. Given power at reference distance (d_0 = 100m) is -32dBm. Path loss exponent is 4 and shadowing loss is 10.5 dB. **[5](CO3)**

b) Explain PN Sequence generator with suitable diagram. **[5](CO4)**

3.a) If a GSM system uses a frame structure where each frame consists of 8 time slots, and each time slot contains 156.25 bits, and data is transmitted at 270.833 kbps in the channel, find (a)the time duration of a bit (b)the time duration of a slot (c)the time duration of a frame (d)How long must a user occupying a single time slot wait between two successive transmissions? **[5](CO2)**

b) Define carrier synchronization. Explain how it is achieved in homodyne detection of QPSK signal? **[5] (CO1)**

4. a) A communication system transmits at 120 kbps and uses 32-FSK. A hop rate of 2000 hops per second is used over an available spectrum of 10 MHz. Calculate (a) data symbol transmitted per hop (b) number of non overlapping hop frequencies. **[5](CO3)**

b) Explain different channel allocation methods available in wireless network. **[5](CO2)**

5.a) Explain the evolution of wireless technologies from 1G to 4G with suitable examples. **[5](CO1)**
b) Explain least mean square algorithm for adaptive equalization. **[5](CO4)**

6. a) Explain the comparison between FDMA,TDMA and CDMA system. **[5](CO2)**
b) Explain GSM system architecture. **[5](CO4)**

7. a) What's a Rake receiver ? Explain operation and principle of M-branch RAKE receiver. **[5](CO3)**

b) Derive the expression of received power using path loss over a reflecting surface. **[5](CO2)**

8 **.**Write short answer on

a) Equalizer [5]**(CO4)**

b) Binary Phase Shift Keying [5]**(CO3)**

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