Roll No

PRESIDENCY UNIVERSITY
BENGALURU
SCHOOL OF ENGINEERING
TEST 1

Winter Semester: 2021 - 22

Course Code: CSE -239

Course Name: Wireless communication and mobile computing

Program & Sem: B.Tech CCE & VI Sem

Date: 26th April 2022

Time: 1.30 PM to 2.30pm

Max Marks 30

Weightage: 15 %

Instructions: *Read the all questions carefully and answer accordingly.*

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries One mark.   **(4Qx 1M= 4M)**

1   Bluetooth operates at_____ of the RF spectrum, supports a maximum data rate of ___

(CO.1, Knowledge)

2. Transmitting voice and data using EM waves at a speed of --------- in open space,

(CO.1, Knowledge)

3. FHSS is used as a multiple access method in the _____scheme

.   (CO.1, Knowledge)

4. The signal was interrupted by an operator as either a dot or dash depending upon its duration

this is now called_____ modulation.   (CO.1, Knowledge)

Part B [Thought Provoking Questions]

Answer the Question. The question carries Four marks.   **(4Qx4M=16M)**

5. Briefly explain the technique employed in an early AM wireless transmitter system with the necessary diagram   (CO.1, Knowledge)

6.Compare 1G, 2G, 3G, 4G, and 5G.Cellular systems   (CO.1, Knowledge)

7 Assume a person traveling from one place to another and he is in phone call. Write the process of signal transfer from one place to another without losing the call   (CO.1, Comprehension)

8 Consider primarily targeting areas like Home Automation, Energy Management, Home security, Medical/Patient tracking, Logistics & Asset tracking and sensor networks, identify the wireless communication technique best suitable for these areas and its key specifications.

(CO.2, Comprehension)

Part C [Problem Solving Questions]

Answer all the Questions. Each question carries Five marks. **(2Qx5M=10M)**

9 A 7 cell cluster has 30 MHz allocated to it for forward channels and each channel is 50 kHz. Assume N=7, find how many channels in each cell. (Use 7 cell cluster diagram)

(CO.2, Comprehension)

10 A service provider wants to provide cellular communication to a particular geographic area the total bandwidth service provider licensed is 5 MHz and system subscriber requires 10 KHz of bandwidth. Determine the system capacity if the service provider implements a cellular system with 35 transmitter sites and cluster size of 7

(CO.2, Comprehension)

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PRESIDENCY UNIVERSITY
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TEST 2

Winter Semester: 2021 - 22

Course Code: CSE -239

Course Name: Wireless communication and mobile computing

Program & Sem: B.Tech & 6th CCE

Date: 1st June 2022

Time: 01.30 PM to 02.30 PM

Max Marks 30M

Weightage: 15 %

Instructions: *Read the all questions carefully and answer accordingly.*

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries ONE marks.   (6Qx 2M= 12M)

Q.NO 1 A business executive can receive business notifications and issue business
         Transactions as long he is in the wireless coverage area. Identify the scenario.
                                                              [1M] [Comprehension Level]
   a) Adaptation   b) Personalization
   c) GSM   d) Broadcast.

Q.NO.2. In TV transmission picture signal is   [1M][Comprehension Level]
   a) Frequency Modulation   b) Amplitude Modulation
   c) Phase Modulation   d) Pulse Modulation.

Q.NO.3. Ionosphere helps in ـــــ the EMW to achieve long distance communication
                                        .   [1M][Comprehension Level]
   a) Wave Bending   b) Wave reflection   c) Wave fading   d) Wave space.

Q.NO.4. Audio frequency range lies between.   [1M] [Comprehension Level]
   a) 20 kHz to 40.5 Hz   b) 20 Hz to 20 KHz   c) 20 kHz to 2 MHz   d) 2 MHz to 200 MHz

Q.NO 5.   Which of the following is not the purpose of modulation.   [1M] [Knowledge Level]
   a) Multiplexing   b) effective radiation
   c) Narrow banding   d) Increase in single power.

Q.NO.6. which one is the advantage of AM over FM,   [1M] [Knowledge Level]
   a) FM has wide bandwidth   b) probability of noise is less in AM
   c) FM has better fidelity   d) FM is more immune to noise.

Part B [Thought Provoking Questions]

Answer all the Questions. Each question carries FOUR marks.(Any TWO)   (2Qx4M=8M)

Q.NO.9. Explain various types of antennas and their radiation pattern

[4M][Comprehension Level]

Q.NO.10. Assume that a voice channel occupies a bandwidth of 4 kHz. We need to multiplex 10 voice channels with guard bands of 500 Hz using FDM. Calculate the required bandwidth   [4M][Knowledge Level]

Q.NO.11 For 8 channels each with a 200 kHz bandwidth are to be multiplexed together, the Total bandwidth of 25 MHz If there is a no guard band between the channel, How many people can use the channel simultaneously?   [4M][Knowledge Level]

Part C [Problem Solving Questions]

Answer both the Questions. Each question carries FIVE marks.   (2Qx5M=10M)

Q.NO.12 The Advanced Mobile Phone System (AMPS) uses two bands. The first band of 824 to 849 MHz is used for sending, and 869 to 894 MHz is used for receiving. Each user has a bandwidth of 20 kHz in each direction. The 2 kHz voice is modulated using FM Creating 20 kHz of modulated signal. How many people can use their cellular phone Simultaneously?   [5M] [Knowledge Level]

Q.NO.13 Explain Digital Modulation Technique and its waveforms. With an example of each.

[5M]   [Knowledge Level]

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END TERM EXAMINATION

Winter Semester: 2021 - 22   **Date**: 30TH June 2022

Course Code: CSE -239   **Time**: 09.30 AM to 12.30 PM

Course Name: Wireless communication and mobile computing   **Max Marks** 100

Program & Sem: B.Tech & 6th CCE   **Weightage**: 50 %

Instructions:
  (i) Read the all questions carefully and answer accordingly.

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries THREE marks.   (10Qx   3M= 30M)

Q.NO.1.The process of transferring a mobile station from one channel or base station to another, , which option is suitable   (C.O.No.2) [Knowledge Level]

  a) Mobile Switching   b) Mobile Station   c) Handoff   d) Roamer

Q.NO.2. A stock broker travelling in a car may wish to issue stock transaction orders from a mobile phone or to receive share price quotations. Which option is suitable for this?   (C.O.No.2)   [Knowledge Level]

  a)Mobile Computing   b) AMPS Computing c) Analog Computing   d) Digital Computing

Q.NO.3. A hexagonal cell within a 4-cell system has a radius of 1.387 km.. A total of 60 channels are

  used within the entire system. If the load per user is 0.029 and λ = 1 call per hour. Find number of channels available per cell.   (C.O.No.3)   [Knowledge Level]

  a) 200   b) 46   c) 30   d) 15

Q.NO.4. A business executive can receive business notifications and issue business transaction as

Long as he is in the wireless coverage area.   (C.O.No.3 [Knowledge Level]

  a) Ubiquity   b) Adaptation   c) Broadcast.   d) Personalization.

Q.NO.5. The range of the RSSI in cellular concept is …………..   C.O.No.3) [Knowledge Level]

  a) 80 to 90db   b) 90 to 100db   c) 100 to 110db   d) 110 to 120db

Q.NO.6. If the total bandwidth is 40 MHz and channel bandwidth is 50 kHz. Calculate the total available channels and total Channels per cell, if N= 12   (C.O.No.4) [Knowledge Level]   a) 800 and 87   b) 800 and 33   c) 800 and 67   d) 800 and 41

Q.NO.7. Assume 5 base station uses 60 channels, irrespective of cell size. If each cell has a radius of 1 km. Find total number of channels without cell splitting is ……..
                                        (C.O.No.2)   [Knowledge Level]

  a) 360   b) 300   c) 12   d) 10

Q.NO.8 For 5 Channels each with a 100 kHz bandwidth are to be multiplexed together with the minimum bandwidth of the link. If there is a need for a guard band of 10 KHz between the channels to prevent interference. Then find the channel bandwidth.
                                        (C.O.No.1)   [Knowledge Level]

  a) 500 KHz   b) 25 KHz   c) 540 KHz,   d) 10 KHz

Q.NO.9 Maximum and minimum amplitudes of an AM wave are 600mW and 200mW respectively. Find the Modulation Index.   (C.O.No.4) [Knowledge Level]
  a) 20%   b) 40%   c) 50%   d) 60%

Q.NO.10 In FM, broadcasting δ=75KHz, modulation frequency is 15Khz and 5V peak to peak. Find the deviation ratio   (C.O.No.4) [Knowledge Level]
  a) 15   b) 5   c) 3   d) 1

Part B [Thought Provoking Questions]

Answer all the Questions. Each question carries EIGHT marks. (5Qx8M=40M)

Q.NO.11 With a neat sketch describe the intra BSC handover and inter BSC handover.
                                        (C.O.No.3)   [Comprehension Level]

Q.NO.12. Assume that a voice channel occupies a bandwidth of 4 kHz. We need to multiplex 10 voice channels with guard bands of 500 Hz using FDM. Calculate the required Bandwidth.

(C.O.No.2)   [Comprehension Level]

Q.NO.13 List out the different types of wireless communication and explain any 3 in detail.

(C.O.No.3)   [Comprehension Level]

Q.NO.14 With a neat waveforms describe the analog modulation technique and write the expression for an AM wave signal with modulation index.   (C.O.No.2) [Comprehension Level]

Q.NO.15 Discuss the following using neat diagram with respect to CDMA.

(C.O.No.3)   [Comprehensive Level]

    i. Soft handoff   ii. Softer handoff
    iii. Soft softer handoff   iv. Hard handoff

Part C [Problem Solving Questions]

Answer both the Questions. Each question carries FIFTEEN marks.
  (2Qx15M=30M)

Q.NO.16 Four channels , two with a bit rate of 200kbps and two with a bit rate 150 kbps are to   be multiplexed using multiple slots TDM with no synchronization bits. Answer the following questions: assume 4 bits from the first 2 sources and 3 bits from the second 2 sources.
  i. What is the size of a frame in bits?
  ii. What is the frame rate?
  iii. What is the duration of a frame?
  iv. What is the date rate?   (C.O.No.4)   [Application Level]

Q.NO.17 A Service provider wants to provide cellular communication to a particular geographic area. The total bandwidth of service provider licensed is 5MHz and system subscriber requires 10 KHz of bandwidth. Determine the system capacity if the service provider implements a cellular system with 35 transmitter's and cluster size of 10.   (C.O.No.4) [Application Level]