

JK Lakshmipat University Jaipur
INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular), November 2017
B.Tech. in Computer Science and Engineering, Semester VII

CSE725: WIRELESS NETWORKS

Roll No.....

Time: 03 hours Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
 2. Assume suitable data wherever required and mention it clearly.
 3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.
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Q.1A Objective type multiple choice questions (10 questions @ 1 mark) 10

- i. Multiple piconets form a network called a
 - A). small area
 - B). scatter net
 - C). network allocation vector
 - D). gadgets
- ii. Low battery level will cause a mobile device to
 - A). Avoid competing for contention slots
 - B). Shift to receive-only mode
 - C). Shut down altogether
 - D). None of these
- iii. What is the technology that communicates over existing AC power lines in a home or office?
 - A). IrDA C). PLC
 - B). Home PNA D). ZigBee
- iv. Which of the following uses a combination of WAP and SMS for its transport?
 - A). EMS
 - B). SMS
 - C). MMS
 - D). d) All of the mentioned
- v. Frames that are used for initial communication between stations and access points are called
 - A). Control frames
 - B). Data frames
 - C). Beacon Frame
 - D). Management Frames
- vi. The wireless sensor network are,

- A). Data centric
 - B). Node centric
 - C). Network centric
 - D). (d) Sensors centric
- vii. Why does TCP not work in WSNs?
- A). TCP incur too much overhead when used in sensors
 - B). The errors accumulate in each wireless hop
 - C). TCP leads to large power consumption
 - D). Both A and B
- viii. Which one of the following frequency is not used in WiMAX for communication?
- A.) 2.3 GHz
 - B.) 2.4 GHz
 - C.) 2.5 GHz
 - D.) 3.5 GHz
- ix. Which layer 2 provides connection-oriented and connectionless data services?
- A). L2CAP
 - B). LMP
 - C). MAC
 - D). PHY
- x. In ad hoc network modern routing protocol are designed in such a way that it must have capability to work with dynamically changing topology is_____
- A). Key management
 - B). Intrusion detection
 - C). Secure routing
 - D). None of the above

Q.2 Short answer type questions (4 questions @ 2.5 marks)

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- i. Is IEEE 802.11 and Wi Fi same/ State the purpose of WiFi?
- ii. Differentiate between active and passive sensors?
- iii. What is WAP 2.0?
- iv. What is Data-Centric Network?

Q.3A Mobility of nodes in a sparsely populated mobile ad ho network is less. What is the choice between proactive routing protocol and reactive routing protocol?

05

Q.3B What are the different states for the nodes in WSNs using the TRAMA protocol? Explain the operation of different states for the nodes in WSN using TRAMA?

05

- Q.4A Describe Bluetooth and its Protocol Architecture with suitable diagram. What type of access method is supported by it? 05
- Q.4B Describe the Temporally ordered routing algorithm (TORA) for ad-hoc networks along with its pros and cons? 05
- OR
- Q.4B Explain 802.11 MAC frame format. How RTS/CTS is different from Beacon based communication method for wireless networks. 05
- Q.5A Design a WLAN for an office building based on statistical models with certain information provided. There is a constraint on where to place an access point on the wireless environment. Consider the following information for network design: there are 4 numbers of walls between an access point and a mobile terminal, transmission power possibility starts from 250mW to 100mW, receiver sensitivity is - 80dBm, distance of maximum access point to building edge is 30 m, and shadow fading margin is 8db. 05
- Q.5B What are the main issues that need to be addressed while designing a MAC protocol for ad hoc wireless networks? 05
- OR
- Q.5B If 20MHz of total spectrum is allocated for a duplex wireless cellular system and each simplex channel has 25KHz RF Bandwidth. Compute the following: 05
- i) total no. of duplex channels
 - ii) total no. of channels per cell site if $N=4$ cell reuse is used
 - iii) total no. of channels per cell site if $N=7$ cell reuse is used
- Q.6A Explain the given attacks and also mention the targeted layer in the protocol stack for the following attacks. 05
- i. Jamming
 - ii. Byzantine attack
 - iii. Routing attacks
 - iv. Repudiation
 - v. Wormhole attack
 - vi. Impersonation
- Q.6B Security for Wireless Networks is different from that of Wire Networks, Explain. What security plans need to be incorporated in Wireless Network to make it secure? 05
- Q.7A What is handoff and Roaming? Explain the types of handoff in details? 05
- Q.7B Explain various channel assignment strategies for Cellular Communication System. A cellular system has 60 duplex channels with 5 channels per cell allocation. If a network has 12 cells, find the total number of available 10

channels, capacity of network, frequency reuse factor and number of cells per cluster (take $i=3, j=2$).

OR

- Q.7B Given a cellular system in which there are a total of 1001 radio channels available for handling traffic. It is also given that the area of a cell is 6km and the area of the entire system is 2100 km². 10
- (A) Calculate the system capacity if the cluster size is 7.
- (B) How many times would the cluster of size 4 have to be replicated in order of approximately cover the entire cellular area?
- (C) Calculate the system capacity if the cluster size is 4.
- (D) Does decreasing the cluster size increase the system capacity? Explain.
- Q.8A What is the significance of power aware routing protocols? Explain the various power aware routing metrics used in such protocol? 05
- Q.8B Name advantages and disadvantages of user acknowledgement in WTP. 05
What are typical applications for both cases?
- Q.9A How does dynamic source routing handle routing? What is the motivation behind dynamic source routing compared to other routing algorithms fixed networks? 05
- Q.9B Assume a system of 32 cells with a cell radius of 1.6km, a total of 32 cells, a total frequency bandwidth that supports 336 traffic channels, and a reuse factor of $N=7$. 10
1. What is the geographic area covered?
 2. How many channels are per cell?
 3. What is the total number of concurrent calls that can be handled?
- Repeat with 0.8km and 128 cells.