Ref. No.: Ex/PG/DMC/T/127A/2024

M.TECH DISTRIBUTED AND MOBILE COMPUTING FIRST YEAR SECOND SEMESTER EXAM 2024

WIRELESS AND MOBILE PROTOCOLS

Time: **3 Hours** **(50 Marks for each Part)** Full Marks: **100**

Part -I (50 Marks)

Use separate **answer script** for each **Part/Group.**

Answer question no. 1 and any two from the rest.

1. Write short notes on the following (any two) : 5X2=10
a) Bluetooth packet format
b) Power control modes in Bluetooth
c) Inter-frame spacings in IEEE 802.11
d) Unlicensed ISM band

2. a) Explain how two Bluetooth devices discover themselves in their proximity.
b) What is Piconet and Scatternet? Is it necessary to form a Scatternet even if you have less than 8 devices? -Justify your answer.
c) Can a device act as a master in more than one Piconets? Explain your answer.
d) What is ZigBee?
7+5+3+5=20

3. a) What do you mean by "Hidden Terminal Problem" and "Exposed Terminal Problem" of wireless communication system? Describe the solutions to these problems as specified in IEEE 802.11.
b) List and briefly define the IEEE 802.11 services.
c) If Bluetooth is a commercial success, what are the remaining reasons for the use of infrared transmissions for WLANs?
(4+8)+5+3=20

4. a) What are the different frequency bands available for WiMAX standard?
b) What is WiMAX forum?
c) What is IEEE 802.16e?
d) Compare and contrast WiMAX with Wi-Fi, 3G and optical fiber deployment scenarios.
4+5+5+6=20

[Turn over

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Time: **3 Hours** Full Marks: **100**

Part -II (50 Marks)

Use separate **answer script** for each **Part/Group**.
Question no. 1 is mandatory and attempts any two from the rest
Make your answer brief and to-the-point.
Use illustrative diagrams wherever necessary.

1. a) State the significance of introducing '***binding update***' message in the **mobile IPv4 (MIPv4) route optimization procedure**. When is it used?
   b) How does ***out-of-date binding*** occur? State its effect on the handoff performance of **MIPv4**. What solution does the **MIPv4 route optimization procedure** provide to overcome the problems created by ***out-of-date binding?***
   (2+2) + (1+1+4)

2. a) Define the ***handoff delay*** a mobile node experience when it changes its **point of attachment** to the network? How is it computed from **standard handoff procedure** of **MIPv6**?
   b) Describe an improved version of the **standard MIPv6 protocol** to reduce its overall **handoff delay**.
   (3+3) + 14

3. a) Compare between the **host-based mobility management** (MM) and **network-based MM**.
   b) Describe the operation of some **network-based localized MM** proposed in literature.
   8 + 12

4. a) State the reasons for the degradation of performances of the **standard TCP** in wireless environment.
   b) Describe the operation of a **protocol** that can improve the performances of **standard TCP** in wireless environment without violating its *end-to-end semantics*.
   6 + (14)