No. of Printed Pages : **2**

Sl. No.

BE11-R4 : WIRELESS AND MOBILE COMMUNICATION

NOTE :

1. **Answer question 1 and any FOUR from questions 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

Total Time : 3 Hours **Total Marks : 100**

1. (a) What is the difference between Multiple Access & Multiplexing ?

(b) What is CDMA ?

(c) Compare DS-SS and FH-SS.

(d) Discuss the important applications of Personal Area Networks (PAN).

(e) Discuss the Advantages of Wireless local loop (WLL)

(f) Suppose Ethernet was the only existing LAN technology, so every host in the Internet was part of a local Ethernet and thus had a globally-unique Ethernet address. Your friend suggests that IP isn't necessary anymore, and the entire Internet could just be one large, switched Ethernet instead. Give two reasons why using existing Ethernet protocols for this is a bad idea from a networking perspective (i.e., don't consider security or privacy).

(g) What is the difference between 3G and 4G ? **(7x4=28)**

2. (a) What is Random Access in Aloha system? Discuss with an example.

(b) Discuss the important features, types and applications of Wide Area Network (WAN). **(9+9)**

3. (a) Discuss WiMax (Worldwide Inter-operability for Microwave Access), its architecture, features and applications in detail.

(b) Difference between Radio wave, Microwave and Infrared waves. **(9+9)**

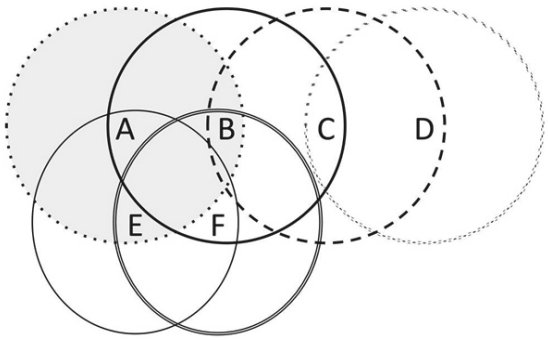
4. (a) Briefly discuss the advantages of Spread Spectrum.

(b) What is Hidden Terminal Problem in wireless LANs. Discuss it with neat and clean diagram. What are the possible solutions to handle this problem ? Discuss briefly. **(9+9)**

5. (a) Consider the wireless topology shown in figure, comprised of 6 nodes. Circles around each node illustrate their transmission range, e.g. A's range is shown by the dotted, shaded circle. Assume that if the transmissions of two nodes will interfere at a location if and only if they transmit at the same time and their transmission areas overlap. In these problems, assume that losses only occur due to collisions.

(i) When node A transmits to node B, list the potential hidden terminals from A (in either direction, i.e., those who might clobber A's transmission or those who A's transmission might clobber) and exposed terminals.

(ii) What about when node B transmits to node C ?



(b) Explain all the power saving features of IEEE 802.15.4. Also, explain the situations in which features could be useful.

(c) Differentiate between packet switching and circuit switching. **(6+6+6)**

6. (a) Discuss the importance of Global System for Mobile Communication (GSM) in detail. List various features of GSM and discuss its subsystems including functionality of Base Station Subsystem (BSS), Network and Switching Subsystem (NSS) and Operating Subsystem (OSS).

(b) List the features of important Generations of Wireless Communication (0^{th} Generation to 5^{th} Generation).

(c) Discuss the importance of Error detection codes and Error correction codes. Give example of any one Error correction and detection codes. For example: Parity Codes, Hamming codes etc. **(6+6+6)**

7. (a) How Digital Enhanced Cordless Telecommunication (DECT) standard for wireless communication works in cordless telephony ? How DECT functionality if different from Cordless telephony via Wi-Fi? Discuss in detail.

(b) What do you understand by Advanced Mobile Phone System (AMPS) ? Discuss the functionality of AMPS in detail. List its features as well.

(c) What is Universal Mobile Telecommunications System (UMTS) ? With the help of diagram, explain the network evolution in Mobile Services. **(6+6+6)**

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