ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL - 2009

MOBILE COMMUNICATION

SEMESTER - 8

Time : 3 Hours] [Full Marks : 70

GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

i) GSM uses ..... for multiplexing.

a) CDMA b) TDMA

c) FDMA d) both (b) and (c). [ ]

ii) A ..... is a computerized centre that is responsible for connecting calls, recording call information and billing.

a) base station b) mobile switching centre

c) cell d) mobile station. [ ]

iii) The access method for wireless LANs defined by IEEE 802·11 is based on

a) CSMA b) CSMA/CD

c) CSMA/CA d) Token passing. [ ]

iv) A Bluetooth network can have ..... master(s).

a) one b) two

c) three d) eight. [ ]

v) A wireless LAN using DSSS with ..... -bit chip codes needs 320 MHz for sending data that originally required a 20 MHz bandwidth.

a) 2·5 b) 20

c) 25 d) 40. [ ]

vi) FHSS, DSSS and OFDM are ..... layer specifications.

a) Physical b) Data link

c) Network d) Transport. [ ]

vii) A Bluetooth frame needs ..... μs for hopping and control mechanisms.

a) 625 b) 259

c) 3 d) a multiple of 259. [ ]

viii) Ad-hoc networks are examples of which type of networks ?

a) Fixed and wired b) Mobile and wired

c) Fixed and wireless d) Mobile and wireless. [ ]

ix) Full form of HSCSD is

a) High Spectrum Circuit Switched Data

b) High Speed Channel Switched Data

c) High Speed Circuit Switched Data

d) High Speed Circuit Switched Devices. [ ]

x) Microwave is suitable for

a) point to point communication

b) Omnidirection communication

c) Broadcast communication

d) none of these. [ ]

xi) Wireless Control Message Protocol (WCMP) is the component of

a) Session Layer b) Transport Layer

c) Application Layer d) Security Layer.

xii) The mechanism of putting a packet into the data part of a new packet and adding a new packet header is known as

a) Decapsulation b) Tunnelling

c) Encapsulation d) Reverse Tunnelling.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Discuss the advantages and disadvantages of Radio wave and Infrared transmission technology in wireless network.

3. How does I-TCP differ from traditional TCP ? What are the advantages and disadvantages of I-TCP ?

4. Briefly describe the GPRS technology.

5. What are the difference between destination sequence distance vector and the standard distance vector routing algorithm ?

6. What is handover ? How is it controlled ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following questions. 3 × 15 = 45

7. a) What are the services provided in a GSM system ? 4

b) Explain how a mobile station connects to and talks with another mobile station. 5

c) How will in-between interfaces differ when a mobile station connects to a PSTN destination ? 6

8. Briefly describe the architecture of Bluetooth. State the functionality of Radio and Baseband layers of Bluetooth protocol. What is TMSI ? 5

9. a) What is the difference between the care-of address and the co-located care-of address ? 3

b) What do you mean by reverse tunnelling and bi-directional tunnelling ? 3

c) How does a reverse tunnel differ from a forward tunnel in the mobile IP protocol ? 4

d) How does the reverse tunnel help when the time-to-live for the packets at a foreign agent is small ? 5

10. a) What are the functions of snooping sub-layer in the snooping TCP protocol ? 3

b) Why is the presumption that congestion is the major factor limiting the data flow not valid for mobile and wireless networks ? 4

c) What are the differences in data flow control in mobile and fixed line networks ? 4

d) List the deficiences in conventional TCP on fixed line networks that warrant modifications for the mobile networks connected to the internet. 4

11. a) Why reverse link presents most difficulty in cellular systems ? 3

b) Prove that for a hexagonal geometry, the co-channel reuse ratio is given by $Q = \sqrt{(3n)}$, where $N = i^2 + ij + j^2$. 4

c) Show that the frequency reuse factor for a cellular system is given by k/S, where k is the average number of channels per cell and S is the total number of channels available to the cellular service provider. 4

d) If a signal-to-interference ratio of dB is required for satisfactory forward channel performance of a cellular system, what is the frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is $(a)_n = 4$, $(b)_n = 3$? Assume that there are six co-channel cells in the first tier, and all of them are at the same distance from the mobile. Use suitable approximations. 4

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