B.E. Computer Science and Engineering Fourth Year Second Semester Examination 2024

Time: 3 hours **Full Marks: 100**

MOBILE COMPUTING

GROUP – A

Answer ANY ONE Question [CO1(K2): Total Marks: 15] from Q1 or Q2

1.

a) What are the characteristics of infrastructureless networks?

b) Why is wireless communication must for designing mobile computing systems? What are the problems associated with it? Mention possible ways to handle these problems.

c) What are the characteristics of *frequency reuse* practice? [2+(1+3+5)+4=15]

2.

a) Why is *frequency reuse* common practice in cellular system? With the help of a diagram show how frequency can be reused with 7 frequency allocations.

b) What are the issues with *mobility* in Mobile Computing Systems? How are these issues taken care of? [(2+5)+(3+5)=15]

GROUP – B

[CO2 (K2, K3): Total Marks: 35]

Answer ANY ONE Question [Marks: 15] from Q3 or Q4

AND

Answer ANY ONE Question [Marks: 20] from Q5 or Q6

3.

a) What are the components of the Radio subsystem in GSM? Mention their functionalities.

b) What are the registers/databases used in Network and Switching (NSS) and Operation subsystem (OSS)? How do they help in the overall working of the mobile system?

c) How does a recipient using a mobile device get call from a PSTN system caller? [5+5+5=15]

4.

a) What does SIM contain? Why is it not dependent on the device?

b) How are the different multiple access techniques used in GSM? Explain with the help of a diagram.

c) How does a caller from a mobile device get connected with the recipient of the call? [5+6+4=15]

5.

a) What different identifiers are used to identify a mobile subscriber and how?

b) Mention the full form of GGSN. What are the functionalities of GGSN?

c) What services are offered between MS and SGSN?

d) What is the difference between the *sniff* and *hold* modes of a Bluetooth devices?

e) What happens during the *paging* procedure in Bluetooth? [5+4+5+2+4=20]

6.
a) What are the GPRS network elements?
b) What are the Reliability classes of GPRS?
c) What GPRS context is kept in Mobile Station (MS) and why?
d) What is Mobile Switching entre (MSC) used for in GPRS?
e) What is *Inquiry Access Code* in Bluetooth? Bluetooth? When is *Channel Access Code* used in Bluetooth? How many slaves does a Bluetooth piconet support? How do Bluetooth devices form scatternet? [4+3+4+2+(2+1+1+3)=20]

GROUP – C

[CO3 (K4): Total Marks: 35]
Answer ANY ONE Question [Marks: 35] from Q7 or Q8

7.
a) What is the necessity of Mobile IP? What is the *Agent Advertisement* used for and by whom? How does registration take place when a Mobile Node (MN) is in *foreign* network?
b) Consider the following figure (Figure 1). Explain the working of Wireless Routing Protocol (WRP) and establish a route between S and K using WRP. What are the possible drawbacks of WRP?

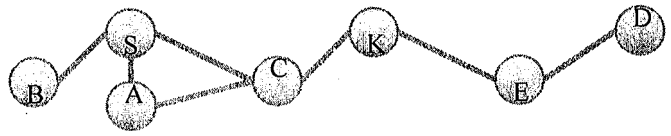

Figure 1

c) How would the route information between S and K (figure 1) be kept if Dynamic Source Routing (DSR) protocol is used? What are the advantages, if any?
d) Suppose an adhoc network is established with large no. of nodes (>25). Which routing protocol would you prefer for this network and why? [(3+3+4)+(10+3)+(5+3)+4=35]

8.
a) How is routing information updated in Destination Sequenced Distance Vector (DSDV) protocol? Explain the working of the DSDV protocol with respect to figure 1 to find a route between A and E. How is DSDV different from Adhoc OnDemand Distance Vector (AODV) Routing protocol?
b) Explain with the help of an example the working of Clusterhead Gateway Switch Routing (CGSR) protocol. Mention its advantages and disadvantages.
c) What are the types of *encapsulations* used in Mobile IP? What is *reverse tunneling* in Mobile IP? [(4+8+4)+(6+4)+(5+4)=35]

GROUP – C

Answer ANY ONE Question [CO4 (K2): Total Marks: 15] from Q9 or Q10

9.

What security services are offered by GSM? How does authentication take place in GSM? Where is hash algorithm used in GSM, if any? What type of algorithm is A5? [4+5+3+3=15]

10.

How is security maintained in GPRS? How does key generation take place in GSM? How is traffic encrypted in GSM? [5+5+5=15]