

First Semester M. E. (Computer Engg.) Examination

MOBILE COMPUTING

Paper - I KMEF 5

P. Pages : 3

Time : Three Hours]

[Max. Marks : 80

- Note :** (1) Due credit will be given to neatness and adequate dimensions.
 (2) Assume suitable data wherever necessary.
 (3) Illustrate your answer wherever necessary with the help of neat sketches.
 (4) Use pen of Blue/Black ink/refill only for writing the answer book.

1. (a) Path Loss, fading and delay spread are the three important radio propagation issues. Explain why those issues are important in a cellular system ? 6
- (b) The transmission power is 40 W under a free space propagation model,
 - (i) What is the transmission power in dB_m ?
 - (ii) The receiver is at a distance of 1000 m, what is the received power, assuming that the carrier frequency $f_c = 900 \text{ MHz}$. and $G_t = G_r = 1 \text{ dB}$.

8

OR

2. (a) What is the diversity reception ? How can it be used to combat Multipath ? 7
- (b) What is delay spread ? What does a small delay spread indicate about the characteristics of a fading channel ? If the delay spread is 1 microsecond, will two different frequencies that are 5 MHz. apart, experience correlated fading ? 7

3. (a) Prove that $N = i^2 + j^2 + ij$
 Where i and j are integers. 6
- (b) A new wireless service provider decided to employ a cluster of 19 cells as the basic module for frequency reuse.
 - (i) Can you identify one such cluster structure ?

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(ii) Find reuse distance in terms of 'R'.

(iii) Can you get an alternative cluster structure for part (i).

7

OR

4. (a) Prove that the 'reuse distance'

$$D = R \sqrt{3N}$$

where $R \rightarrow$ Radius of each cell

$N \rightarrow$ No. of cells in a cluster.

6

(b) During busy hour the no. of calls per hour for each of the 12 cells of a cellular cluster is 2220, 1900, 4000, 1100, 1000, 1200, 1800, 2100, 2000, 1580, 1800 and 900. Assume that 75% of the car phones in this cluster are used during this period and that one call is made per phone :

(i) Find the no. of customers in the system.

(ii) Assuming the average hold time of 60 seconds, what is the total Erlang value of the system ?

(iii) Find the reuse distance 'D' if $R=5$ kms.

7

5. (a) Explain the parameters influencing Hand offs.

7

(b) In the RSA algorithm, the public key is transmitted to all MSs, through the air by the BS. How is its security ascertained ? Explain clearly.

6

OR

6. (a) What is meant by bidirectional tunneling ? Why do you need HA-FA in addition to the HLR-VLR pair ? Explain clearly.

7

(b) What are the steps involved in registrations of MS ? Describe with suitable diagram.

6

7. (a) Explain location aided routing scheme with examples of expected zone.

7

(b) What is source initiated on demand routing ? Explain dynamic source routing in detail.

7

OR

8. (a) Explain Routing. What are the goals for selecting routing protocol ? 7
(b) What are the advantages of wireless sensor networks over wired sensor networks ? Hence explain in brief fixed wireless sensor network with suitable architecture. 7
9. (a) What are the important requirements of wireless LAN. 6
(b) Explain in brief the Blue tooth core protocols with block diagram. 7

OR

10. (a) State the advantages and disadvantages of Infrared LANs. 6
(b) What are the advantages and disadvantages of WLAN compared to Wired LAN ? 7
11. (a) Explain in brief instruction detection models for MANET. 7
(b) Explain in brief basic function of smart antenna with neat sketch. 6

OR

12. (a) How radio resources are managed efficiently for high speed multimedia communications ? 7
(b) What are the challenges in the actual design of sensor networks ? 6



