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**Question Paper Code: 41856**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Fifth Semester

Information Technology

14UIT506 - WIRELESS COMMUNICATION

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Which of the following is the main part of basic cellular system?
  - A mobile unit
  - A mobile telephone switching office
  - A cell site
  - All of the above
- Expand MCHO.
  - Mobile Controlled Hand Off
  - Mobile Carry Hand Off
  - Mobile Carrier Hand Of
  - Mobile Current Hand Off
- Shadowing is to predict what \_\_\_\_\_ when designing a wireless communication system?
  - radio coverage
  - Modulation
  - frequency
  - amplitude
- Path loss may be due to many effects, such as
  - free space loss
  - diffraction
  - refraction
  - all the above

5. Fading of the received radio signals in a mobile communication environment occurs because of
- (a) Direct propagation (b) Bi-path propagation  
(c) Multipath propagation (d) None of the above
6. A block of data consisting of 2048 bits is transmitted between two computers interconnected by 450 m of twisted-pair wire. If the transmission rate is 34 kbps determine, the ratio of propagation delay to transmission delay.
- (a)  $376 \times 10^{-6}$  (b)  $3.76 \times 10^{-3}$  (c)  $3.76 \times 10^{-6}$  (d)  $37.6 \times 10^{-6}$
7. To overcome the effect of inter carrier interference and ISI, which is introduced
- (a) Cyclic prefix (b) MLSE  
(c) DFE (d) All the above
8. A rake receiver is a radio receiver designed to counter the effects of
- (a) Fading (b) Singlepath fading  
(c) Shadow fading (d) Multipath fading
9. The CDMA reverse channel employs \_\_\_\_\_ digital modulation technique.
- (a) BPSK (b) OQPSK (c) QPSK (d) OFDM
10. A mobile assisted power control on the forward channel is implemented to reduce \_\_\_\_\_ interference.
- (a) cochannel (b) intracell (c) intercell (d) near-far

PART - B (5 x 2 = 10 Marks)

11. What are the channels used in mobile communication systems?
12. Mention the three partially separable effects of radio propagation.
13. Define doppler spread.
14. What do you mean by near-far effect in wireless network?
15. What is the need for CDMA digital cellular standard (IS-95)?

PART - C (5 x 16 = 80 Marks)

16. (a) Discuss briefly the overview and evolution of wireless communication with an example. (16)

Or

- (b) Describe the frequency reuse of cellular systems. In what way reuse helps in improving coverage and capacity. Explain with suitable example. (16)

17. (a) Explain the various empirical path loss models. Give example. (16)

Or

- (b) Given a cellular system which has a total of 1001 radio channels available for handling traffic and given the area of a cell is  $6 \text{ km}^2$  and the area of the entire system is  $2100 \text{ km}^2$ .

- (i) Calculate the system capacity if the cluster size is 7.
- (ii) How many times would the cluster of size 4 have to be replicated in order to approximately cover the entire cellular area?
- (iii) Calculate the system capacity if the cluster size is 4.
- (iv) Does decreasing the cluster size increase the system capacity? (16)

18. (a) What is fading? Describe the fading models for the distribution of the attenuation in detail. (16)

Or

- (b) Illustrate the fading effects due to multipath time delay spread with an example. (16)

19. (a) Explain the various diversity techniques for fading channel in wireless system. Give example. (16)

Or

- (b) Compare and contrast the LMS and RLS algorithms for a mobile communication environment. (16)

20. (a) Write short notes on

(i) OFDM system (8)

(ii) IEEE 802.11 a standard (8)

Or

(b) Discuss the CDMA digital cellular standard (IS-95). Give example. (16)

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