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Question Paper Code : 61215

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Eighth Semester

Electronics and Communication Engineering

EC 1451 — MOBILE AND WIRELESS COMMUNICATION

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Doppler Effect.
2. Binary phase-shift keying (BPSK) modulation transmits the signal $s_1(t) = \alpha \cos(2\pi f_c t)$, $0 \leq t \leq T$, to send a 1-bit and the signal $s_2(t) = -\alpha \cos(2\pi f_c t)$, $0 \leq t \leq T$, to send a 0-bit. Find the set of ortho-normal basis functions and coefficients $\{s_{ij}\}$ for this modulation.
3. Consider a wireless LAN operating in a factory near a conveyor belt, the transmitter and receiver have a LOS path between them with gain α_0 , phase β_0 , and delay T_0 . Every T_0 secs, a metal item comes down the conveyor belt, creating an additional reflected signal path with gain α_1 , phase β_2 , and delay T_1 , phase and delay. Find the time-varying impulse response $c(T, t)$ of this channel.
4. State the difference between IPV4 and IPV6.
5. Compare ad-hoc network with sensor network in terms of data handling capability.
6. List out the salient features of location based routing protocols.
7. Mobile computing need to be energy aware – why?
8. Write down the steps involved in data forwarding in mobile IP.
9. Compare GloMoSim with NS2 simulator.
10. What are the special features available in Opnet simulator?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the system model of Direct Sequence Spread Spectrum with relevant diagram. (10)
(ii) Discuss the function of rake receiver with a neat sketch. (6)

Or

- (b) (i) Explain the system model of Frequency Hopping spread Spectrum with relevant diagram. (10)
(ii) Compare the various multiple access mechanism used in mobile communication. (6)

12. (a) Compare and contrast the scheduled based MAC with Contention based MAC detailing with any two protocol for each category. (16)

Or

- (b) Discuss the various issues and challenges involved in 3G networks also enumerate the mechanisms adopted in CDMA 2000 to overcome these problems. (16)

13. (a) Describe the working mechanisms of DSR and AODV routing protocol with suitable network scenario and also compare their performance in terms of network parameter. (16)

Or

- (b) Describe the working mechanisms of group mobility and Point mobility with suitable network scenario and also compare their performance in terms of network parameter. (16)

14. (a) Present your understanding on IP packet delivery, Agent discovery, registration, tunneling and encapsulation related to Mobile IP. (16)

Or

- (b) Mobile Networks face several threats; hence security aspects need more attention. Discuss the various mechanisms available to tackle these problems in mobile networks. (16)

15. (a) With neat sketch, explain the architecture of IP based cellular network and compare 3G with 2G cellular networks. (16)

Or

- (b) (i) Write down the syntax of NS 2 to create 5 nodes and formulate mesh topology with these nodes by setting up the essential link parameters. (8)

- (ii) Discuss key aspects involved in evaluating routing and transport protocol of mobile networks. (8)