



**ANNA UNIVERSITY CHENNAI**  
**B.E (Full Time) DEGREE END SEMESTER EXAMINATIONS, APR / MAY 2014**  
**COMPUTER SCIENCE & ENGINEERING BRANCH**  
**SIXTH SEMESTER- REGULATIONS 2008**  
**CS9352 MOBILE AND PERVASIVE COMPUTING**

Time: 3 hours

Max Mark: 100

Answer ALL Questions

**Part-A (10 x 2= 20 Marks)**

1. Why electromagnetic waves with low frequency cannot be used for data transmission in computer networks?
2. A cellular system uses FDMA with a spectrum allocation of 25.5 MHz in each direction, a guard band at the edge of the allocated spectrum of 20 kHz and a channel bandwidth of 40 kHz. Calculate the number of available channels.
3. Enumerate the power saving modes of Bluetooth technology with its appropriate addressing scheme.
4. Express various Inter Frame Spaces(IFS) of the IEEE 802.11 MAC protocol in terms of slot time.
5. How can you overcome the looping problems in ad hoc routing algorithms?
6. State when DHCPRELEASE is invoked in DHCP protocol?
7. List down the limitations of traditional TCP in wireless networks.
8. Write a WML script to convert meter to centimetre on mobile phone.
9. Define pervasive computing.
10. What type of context information required to develop a navigational system for a car?

**Part-B (5 x 16= 80 Marks)**

- 11 .i With a neat diagram explain the functional architecture of the GSM system. (10)
  - ii. Explain the message flow diagram for Mobile Originated Calls (MOC). (6)
  - 12.a.i Using IEEE 802.11, 5 stations are trying to access the medium during the following timings. S2 -10.00 am, S1-after 10 ms, S4 -after 4 ms, S5- after 20ms S3 after 2ms. DIFS -15ms, Back off time for the station S1, S2, S3 ,S4 and S5 are 7ms,1ms, 6ms, 10ms,4ms respectively. Packet transfer time after accessing the medium by S1, S2, S3 , S4 and S5 are 8ms, 18ms, 9ms, 17ms and 15ms respectively. Give the timing diagram for accessing the medium and transferring the data by all the stations and also show the time taken to complete the transactions using DFWMAC-DCF. (16)
- (OR)**
- 12.b.i Explain how are fairness problems regarding channel access can be solved in IEEE 802.11 and HIPERLAN? (8)
  - 12.b.ii Explain the schematic architecture of Bluetooth. (8)

13.a.i Consider a mobile node MN from network X. The user of MN wishes to communicate with a corresponding node CN in network Y. The node MN moves from X to a foreign network A. Describe the sequence of messages that are required in Mobile IPv4 so that MN and CN can continue to communicate. Include both the user data messages and the Mobile IP control messages. (16)

Now, consider the case where CN moves to foreign network B while MN is still in the foreign network A. Can CN and MN still communicate? (Does Mobile IP support both endpoints moving?) Show the message flow to indicate how it will succeed or fail in this case.

(OR)

13.b.i How Dynamic Source Routing (DSR) algorithm handles routing for ad hoc network? How does it overcome the looping and count to infinity problem? Illustrate with an example. (16)

14.a.i Give the WAP architecture and explain how the secure session is established by the Wireless Transport Layer Security ( WTLS ) between the originator and the peer. (16)

(OR)

14.b.i Compare and contrast I-TCP, Snooping TCP and Mobile TCP. (16)

15.a.i Why and when do the following device technologies receive preference by the designers of portable computing devices which may become part of larger pervasive computing solutions: (16)

- (i) Force-feedback-based (Haptic) interfacing technology
- (ii) Tegic T9-based Keypad technology
- (iii) Speech-recognition-based input technology

(OR)

15.b.i Explain Windows CE and Palm OS with its respective strength and weakness. Support your answer with the development cycle. (16)

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