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B.E./B. TECH. DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY'2014

INFORMATION TECHNOLOGY

VI SEMESTER (REGULATIONS 2008)

IT9352 – WIRELESS NETWORKS

Time: Three hours

Maximum: 100 marks

Answer ALL questions.

PART A – (10X2 = 20 marks)

1. Why does ITU-R only regulate lower frequencies (up to some hundred GHz) and not higher frequencies (in the THz range) ?
2. What limit the data rates that can be achieved with GPRS and HSCSD using real devices (compared to the theoretical limit in a GSM system)?
3. Compared to the traffic channels offered, standard GSM could provide a much higher data rate (33.8 kbps) when looking at the air interface. What lowers the data rates available to a user?
4. What are the reasons for delays in a GSM system?
5. Why physical layer in IEEE802.11 is subdivided?
6. How are the fairness problems regarding channel access solved in IEEE802.11 ?
7. What advantages does the use of IPv6 offer for mobility?
8. Can the problems using TCP in wireless be solved by replacing TCP with UDP? Justify.
9. How can a user access the features of mobile phones via web browser?
10. What advantages has the statelessness of HTTP ?

PART B - (5X16 = 80 marks)

11. The Pacific Digital Cellular (PDC) TDMA system uses a 42 kbps data rate to support 3 users per frame. Each user occupies two of the six time slot per frame.
- (a) What is the raw data provided for each user? (04)
 - (b) If the frame efficiency is 80% and the frame duration is 6.667 ms, determine the number of information bits send to each user per frame. (04)
 - (c) If half-rate speech coding is used, six users per frame are accommodated. Determine the number of information bits provided for each user per frame. (04)
 - (d) What is the information data rate per user in half-rate PDC ? (04)
12. (a)(i) Present the overview of IEEE802.11 system and protocol architecture. (08)
- (ii) Explain the synchronization and power management in IEEE802.11 infrastructure network. (08)
- Or**
- (b) (i) Explain the DSDV and DSR ad-hoc routing algorithms. (08)
- (ii) Draw and explain the WIMAX architecture proposed by WIMAX forum. (08)
13. (a) (i) What is the goal of GPRS? Explain the network and protocol architecture of GPRS. (10)
- (ii) How much of the original GSM network does GPRS need? Which elements of the network perform the data transfer? (06)
- Or**
- (b)(i) If a GSM uses a frame structure where each frame consists of eight time slots, and each time slot contain 156.25 bits, and data is transmitted at 270.833 kbps in the channel, find
- I. The time duration of a bit (02)
 - II. The duration of a slot (02)
 - III. The time duration of a frame (02)
 - IV. How long must a user occupying a single time slot wait between two successive transmission. (02)
- (ii) If a normal GSM time slot consists of six trailing bits, 8.25 guard bits, 26 training bits, and two traffic bursts of 58 bits of data, find the frame efficiency. (08)

14. (a) Explain the following types of TCP used for mobility support at transport layer:
- i. Indirect TCP (03)
 - ii. Snooping TCP (03)
 - iii. Mobile TCP (03)
 - iv. Transaction-oriented TCP (03)
 - v. Compare the advantages and drawbacks of each of the above in a tabular form. (04)

Or

- (b) (i) Explain the problem called "triangular routing". With schematic explain how optimization can be carried out for this. (10)
- (ii) Explain the QoS requirement for the TCP over 2.5/3G wireless networks. (06)
15. (a) (i) Present and explain the components and interface of the WAP 1.x architecture. (12)
- (ii) Elaborate the scenario of fixed and wireless network for the integration of different components of WAP. (04)

Or

- (b) (i) Draw a WTA logical architecture and explain each components. (08)
- (ii) With flow diagram explain the voice message delivery in WTA. (08)
