## DiplETE – ET (NEW SCHEME)  –  Code: DE66

### Subject: WIRELESS & MOBILE COMMUNICATIONS

Time: 3 Hours

**DECEMBER 2011**

Max. Marks: 100

**NOTE: There are 9 Questions in all.**

- **Please write your Roll No. at the space provided on each page immediately after receiving the Question Paper.**
- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 Minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

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**Q.1** **Choose the correct or the best alternative in the following:** (2×10)

a. Who developed the theory of electromagnetic waves?

  (A) Marconi           (B) Clerk Maxwell
  (C) Hertz             (D) Antheil

b. _____ follows Ethernet protocol.

  (A) LAN             (B) WAN
  (C) XAN             (D) MAN

c. If the data unit is 111111 and the divisor is 1010, then the dividend at the transmitter is
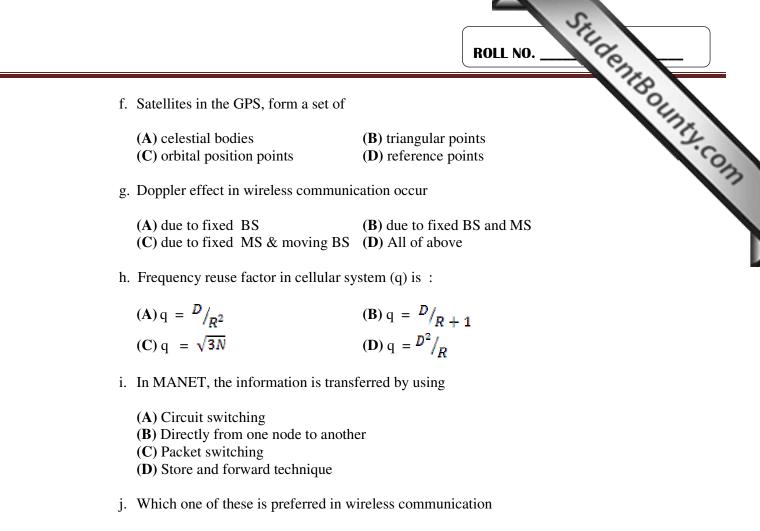
  (A) 1111111000        (B) 1111110000
  (C) 111111            (D) 11111000

d. MSC will

  (A) Control a cell's activity
  (B) Extend a network
  (C) Cover temporary cellular services for a special event
  (D) Provide switching and radio control functions

e. Microcells are deployed in a network to

  (A) Increase cellular capacity      (B) Economic
  (C) Improve signal reception      (D) Reduce handoffs and relieve traffic

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f. Satellites in the GPS, form a set of

(A) celestial bodies           (B) triangular points
(C) orbital position points      (D) reference points

g. Doppler effect in wireless communication occur

(A) due to fixed BS          (B) due to fixed BS and MS
(C) due to fixed MS & moving BS   (D) All of above

h. Frequency reuse factor in cellular system (q) is :

(A) $q = D/R^2$             (B) $q = D/{R+1}$

(C) $q = \sqrt{3N}$           (D) $q = D^2/R$

i. In MANET, the information is transferred by using

(A) Circuit switching
(B) Directly from one node to another
(C) Packet switching
(D) Store and forward technique

j. Which one of these is preferred in wireless communication

(A) HTML          (B) XML
(C) WML          (D) SGML

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**Answer any FIVE Questions out of EIGHT Questions.**
**Each question carries 16 marks.**

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**Q.2** a. Explain the evolution of cellular system in brief. **(8)**

b. How is an adhoc network different from a sensor network. **(4)**

c. Differentiate between wireless MANs, LANs and PANs. **(4)**

**Q.3** a. Discuss the role of reflected and diffracted radio signals in cellular system. Explain with suitable examples. **(10)**

b. The generator polynomial of a(7,4) cyclic code is G (p) = p³ + p + 1, obtain all the code vectors for the code in non systematic form. **(6)**

**Q.4** a. What are the advantages of cell sectoring. Explain with suitable diagram. **(6)**

b. How does slotted ALOHA improves the throughput as compared to pure ALOHA? **(6)**

c. If 40 MHz of total spectrum is allocated for a duplex wireless cellular system and each simplex channel has 25 kHz RF bandwidth, find
(i) the number of duplex channels.
(ii) the total number of channels per cell site, If $N = 3$, cell reuse is used. **(4)**

**Q.5** a. What do you mean by multiple access techniques in mobile cellular system? Explain OFDM in brief. **(8)**

b. What are the specific advantages of static channel allocation over dynamic channel allocation strategies? **(8)**

**Q.6** a. What do you mean by handoff? Explain the different Hand off strategies required to make the Hand off efficient. **(8)**

b. What are the differences between orbital and elevation angles of a satellite? **(4)**

c. Why can there be more than one satellite orbiting in a single orbiting Path of GPS? **(4)**

**Q.7** a. Compare AMPS and GSM system in terms of coverage area, transmitting time, power and error control? **(10)**

b. Explain the logical channels of IS-95. **(6)**

**Q.8** a. What are the differences between cellular and mobile Adhoc Networks? **(6)**

b. How do you use a 'data centric' approach in a sensor network? **(4)**

c. How can you provide security in an adhoc Network? What are their possible scheme and their relative advantages? **(6)**

**Q.9** Write short notes on any **TWO**: **(8×2)**

(i) IEEE802.16
(ii) Smart Antennas
(iii) Ultra-wideband Technology