

DipIETE – ET (NEW SCHEME) – Code: DE66**Subject: WIRELESS & MOBILE COMMUNICATIONS**

Time: 3 Hours

Max. Marks: 100

DECEMBER 2011

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.

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

- 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

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

- 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 $G(p) = p^3 + p + 1$, 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