Code: DE66   **Subject: WIRELESS & MOBILE COMMUNICATIONS**

DipIETE – ET

Time: 3 Hours   JUNE 2013   **Max. Marks: 100**

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- **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. The WPAN technology used in

(**A**) USB   (**B**) RS-232
(**C**) GPS   (**D**) Bluetooth

b. The radio wave propagation effects are

(**A**) Reflection   (**B**) Scattering
(**C**) Distortion   (**D**) Both (**A**) and (**B**)

c. The coherence bandwidth is given by

(**A**) $\dfrac{1}{2\pi\tau_d}$ (**B**) $\dfrac{2\pi}{\tau_d}$

(**C**) $\dfrac{\tau_d}{2\pi}$ (**D**) $2\pi\tau_d$

d. _____ has high throughput

(**A**) ALOHA   (**B**) Slotted ALOHA
(**C**) CSMA   (**D**) Both (**A**) & (**B**)

e. In spread spectrum transmission technique, data occupy relatively

(**A**) A larger bandwidth   (**B**) A smaller bandwidth
(**C**) Constant bandwidth   (**D**) None of these

f. The operational spectrum of HiperLAN2 is

(**A**) 1 GHz   (**B**) 1.5 Ghz
(**C**) 2.4 Ghz   (**D**) 5 GHz

g. Frequency reuse factor in cellular system (q) is

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

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

h. DSDV routing protocol is used in

(A) Bluetooth (B) WLAN
(C) MANET (D) WSN

i. Wireless access card use _____ protocol to resolve shared access of the channel

(A) CSMA/CD (B) CDMA/CA
(C) CSMA (D) DAMA

j. Microcells are deployed in a network due to

(A) Increasing cellular capacity (B) Economics
(C) Improving signal reception (D) Reducing handoffs and reliving traffic

---

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

Q.2 a. With the help of neat diagram explain the cellular system infrastructure. **(8)**

b. With a neat diagram explain the wireless communication system. **(8)**

Q.3 a. Distinguish between
(i) Fast fading and slow fading
(ii) Delay spread and coherence bandwidth **(8)**

b. Explain with example the concept of an interleaver. **(8)**

Q.4 a. Explain cell splitting and cell- sectoring in cellular concept. **(8)**

b. Define co-channel and adjacent channel interference. **(4)**

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

Q.5 a. Draw and explain the structures of forward and reverse channels in a TDMA/TDD and TDMA/FDD system. **(10)**

b. Compare Fixed channel allocation and Dynamic channel Allocation. **(6)**

Code: DE66   Subject: WIRELESS & MOBILE COMMUNICATIONS

Q.6 a. Draw and explain GEO satellite beam footprint.   **(6)**

   b. In the satellite system, there is some degree of free space loss. Besides this loss, does it have any other source of loss? Explain   **(10)**

Q.7 a. What is GSM? Explain its frequency bands and channels used. Also discuss its frame structure.   **(8)**

   b. Draw and explain universal mobile telecommunication system (UNTS) architecture.   **(8)**

Q.8 a. Discuss the factors involved in a routing of MANET and also the routing goals.   **(10)**

   b. Draw and explain general architecture of a fixed sensor node.   **(6)**

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

   (i)   Home RF Technology
   (ii) UWB system characteristic
   (iii) Smart Antennas features