Code: DE66/DE116   Subject: WIRELESS & MOBILE COMMUNICATIONS

DipIETE – ET (Current & New Scheme)

Time: 3 Hours   **JUNE 2017**   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. _____ distributes handoff decision process.
   (**A**) NAHO   (**B**) MAHO
   (**C**) SHO   (**D**) None

b. Mostly _____ is used in wireless LAN.
   (**A**) TDM   (**B**) OFDM
   (**C**) SDM   (**D**) None

c. _____ has higher Doppler spread.
   (**A**) Fast fading   (**B**) Slow fading
   (**C**) Frequency selective fading   (**D**) None

d. In cyclic redundancy checking, CRC is _____
   (**A**) divisor   (**B**) quotient
   (**C**) dividend   (**D**) remainder

e. Medium Earth Orbit (MEO) satellite system operate at about _____ km above earth.
   (**A**) 5,000   (**B**) 10,000
   (**C**) 1,500   (**D**) None

f. The basic GSM is based on _____ traffic channels.
   (**A**) connection oriented   (**B**) connection less
   (**C**) packet switching   (**D**) circuit switching

g. _____ is a process in which same set of frequencies can be allocated to more than one cell, provided that cells are separated by a sufficient distance.
   (**A**) Frequency reuse   (**B**) Handoff
   (**C**) Radio survey   (**D**) clustering

h. _____ is a process of dividing area of cell into more cells.
   (**A**) Cell splitting   (**B**) Cell clustering
   (**C**) Cell partitioning   (**D**) Cell sectoring

i. _____ is a table driven routing protocol.
   (**A**) Adhoc on demand distance vector routing protocol
   (**B**) Cluster based routing protocol
   (**C**) Global state routing protocol
   (**D**) Dynamic source routing protocol

j. _____ doesn't uses telecom networks & is fastest network.
   (**A**) WMAN   (**B**) WWAN
   (**C**) WLAN   (**D**) None

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

Q.2 a. Explain with diagram, the characteristics & infrastructure of cellular systems. **(10)**

b**.** Write a short note on:

   (i) Network Protocols
   (ii) Adhoc and Sensor network **(6)**

Q.3 a. Discuss

   (i) Cyclic Codes
   (ii) Convolutional Codes **(8)**

b. In US digital cellular system, if f_c = 900 MHz & mobile velocity is 70km/hr, calculate received carrier frequency if mobile

   (i)   directed towards transmitter.
   (ii) directed away from transmitter.
   (iii) in a direction perpendicular to direction of arrival of transmitted signal. **(8)**

Q.4 a. With respect to mobile cellular communication, explain the terms:

   (i)   Cell sectoring
   (ii) Co-channel interference
   (iii) Cell splitting
   (iv) Cell clustering **(12)**

b. Write a short note on Multiple Radio Access Protocols. **(4)**

Q.5 a. Differentiate between TDMA and FDMA. **(5)**

b. What are the differences between Static Allocation and Dynamic Allocation? **(5)**

c. A zero mean sinusoidal message is applied to a transmitter that radiates an AM signal with 400 kW power. Compute carrier power if signal is modulated on a depth of 0.75:

   (i)   What % of total power is in carrier?
   (ii) Power in each sideband.
   (iii) Total power saving, if carrier & one sideband are suppressed. **(6)**

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Q.6   Write a short note on:

    (i)   Types of satellite system
    (ii)   Global positioning system
    (iii) Handoff and its parameter
    (iv)   Multicasting   **(16)**

Q.7   a. With respect to GSM, explain:

    (i)   Channel types
    (ii)   Services & features
    (iii) Architecture   **(12)**

    b. Discuss about IS-41.   **(4)**

Q.8   a. Differentiate between Table driven & On Demand Routing Protocols.   **(5)**

    b. Discuss with respect to MANETs

    (i)   Characteristics
    (ii)   Applications   **(5)**

    c. Write few advantages of wireless sensor networks.   **(6)**

Q.9   Discuss any **TWO**:

    (i)   WMANs
    (ii)   WLANs
    (iii) Ultra-Wideband Technology
    (iv)   Directional & Smart Antennas   **(8x2 = 16)**