

Code: DE66/DE116 Subject: WIRELESS &amp; MOBILE COMMUNICATIONS

**DipIETE – ET (Current & New Scheme)**

Time: 3 Hours

**June 2018**

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 frequency reuse distance increases \_\_\_\_\_.
  - (A) With the square root of the cluster size
  - (B) Proportionally with cluster size
  - (C) With the square of the cluster size
  - (D) With the logarithm of the cluster size
  
- b. In pure ALOHA, the vulnerable time is \_\_\_\_\_ the frame transmission time.
  - (A) the same as
  - (B) two times
  - (C) three times
  - (D) None of these
  
- c. The probability distribution of the envelope for the composite signals for a receiver far from the transmitter in fast fading is a \_\_\_\_\_ distribution.
  - (A) Gaussian
  - (B) Random
  - (C) Rayleigh
  - (D) Ricin
  
- d. In linear block codes, the Generator matrix G is given by
  - (A)  $G = [I_k|P]_{k \times n}$
  - (B)  $G = [I_k|P]_{n \times k}$
  - (C)  $G = [I_n|P]_{k \times n}$
  - (D)  $G = [I_n|P]_{n \times k}$
  
- e. \_\_\_\_\_ can be achieved by using multiplexing; \_\_\_\_\_ can be achieved by using spreading.
  - (A) Privacy and efficiency; anti jamming
  - (B) Privacy and anti-jamming; efficiency
  - (C) Efficiency; privacy and anti-jamming
  - (D) Efficiency and anti-jamming; privacy
  
- f. The received power from a satellite is determined by:
  - (A) Transmitting power
  - (B) Gain of the transmitting and receiving antenna
  - (C) Distance between the satellite transmitter and the receiver
  - (D) All of these

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- g. Handoff can be initiated either by the BS or the MS, and it could be due to  
 (A) The radio link (B) Network management  
 (C) Service issues (D) All of these
- h. In which cellular system speech signals are transmitted employing FM, and important control information is transmitted in digital form using FSK?  
 (A) GSM (B) AMPS  
 (C) IS-41 (D) IS-95
- i. AODV and TORA are examples of \_\_\_\_\_ routing protocols.  
 (A) Proactive (B) Reactive  
 (C) Both (A) and (B) (D) None of these
- j. The modulation of IEEE 802.11a uses \_\_\_\_\_ with \_\_\_\_\_ subcarriers.  
 (A) BPSK; 24 (B) OFDM; 24  
 (C) OFDM; 52 (D) BPSK; 52

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

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- Q.2** a. Draw and explain the infrastructure of a cellular system. What are reverse and forward channels? (8)
- b. Write a short note on Ad hoc networks and sensor networks. (8)
- Q.3** a. Distinguish between  
 (i) Fast fading and slow fading  
 (ii) Delay spread and coherence bandwidth (8)
- b. Find linear block code generator matrix **G** if code generator polynomial  $g(x) = 1 + x + x^3$  for a (7, 4) code. What is the corresponding parity check matrix **H**? Find code vector if the message vector is  $\mathbf{m} = [1 \ 0 \ 1 \ 1]$  (8)
- Q.4** a. Explain cell splitting and cell-sectoring in cellular concept. (6)
- b. Describe with throughput equations 1-persistent CSMA and p-persistent CSMA. (6)
- c. What is the concept of frequency re-use and how is it implemented? (4)
- Q.5** a. Give the comparison between FDMA, TDMA and CDMA in terms of concept, handoff, signal separation, advantage, disadvantages, applications etc... (8)
- b. Compare Fixed and Dynamic Channel Allocation Schemes (8)

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- Q.6** a. Draw and explain the satellite system architecture. What is footprint? What is path diversity and give the conditions behind its usage? (10)
- b. Draw and explain detailed block diagram of a cellular system. (6)
- Q.7** a. Describe the identity numbers IMSI, MSISDN, IMSEI and LAI associated with a GSM system. (8)
- b. Explain Logical channels in IS-95 with a neat diagram. (8)
- Q.8** a. Explain any two Table Driven Routing protocols. (8)
- b. Draw and Explain general architecture of Fixed Wireless sensor networks. (8)
- Q.9** Write short notes on:
- a. Smart Antenna and the concept of beam forming. (6)
- b. IEEE 802.11 (6)
- c. HomeRF Technology (4)