

AMIETE – ET (NEW SCHEME)

Time: 3 Hours

JUNE 2012

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. Wireless access network unit (WANU) consists of:

(A) Base station transceivers	(B) Radio controller
(C) Access manager	(D) all of the above
- b. The design process of selecting and allocating channel groups for all cellular base station within a system is called:

(A) Adjacent channel interference	(B) Frequency planning
(C) Near far affect	(D) Co- channel interference
- c. If the subscriber moves from one cell to other cell within BSC then this type of hand off is called:

(A) Inter-cell-inter BSC handover	(B) Intra-cell-intra BSC handover
(C) Inter-cell-intra BSC handover	(D) Inter MSC handover
- d. Which technique carries only one phone circuit at a time

(A) FDMA	(B) CDMA
(C) TDMA	(D) all of the above
- e. Wi-Fi stands for

(A) Wireless frequency	(B) Wire line fidelity
(C) Wireless function	(D) Wireless fidelity
- f. The IEEE standard for wireless PAN Bluetooth is:

(A) IEEE802.11	(B) IEEE802.15
(C) IEEE802.16	(D) IEEE802.14
- g. Which of these is not a third generation cellular system

(A) UMTS	(B) 3G PCS
(C) GSM	(D) IMT -2000

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h. The expression $P_e = Q \left(\sqrt{2E_b/N_0} \right)^{1/2}$ is probability of error for which of the following:

- | | |
|----------|------------------|
| (A) QPSK | (B) DPSK |
| (C) BPSK | (D) $\pi/4$ QPSK |

i. If the bandwidth of signal is greater than that of channel then it is:

- | | |
|--------------------------------|----------------------|
| (A) Frequency selective fading | (B) Fast fading |
| (C) Slow fading | (D) Multipath fading |

j. Which of these is not a packet radio protocol

- | | |
|----------------|-------------------|
| (A) Pure aloha | (B) Slotted aloha |
| (C) PRMA | (D) X.25 protocol |

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

Q.2 a. Briefly describe:

- (i) Frequency Reuse
- (ii) Channel Allocation Schemes
- (iii) Interference and system capacity
- (iv) Trunking and Grade of service

(4×2=8)

b. A Hexagonal cell within a four-cell system has a radius of 1.387 km. A total of 60 Channel is used. If load per user is 0.029 Erlangs and $\lambda = 1$ call /hr compute for an Erlangs C system that has 5% probability of delayed call: **(8)**

- (i) How many users it can support?
- (ii) Probability that a call will have to wait more than 10 sec.?
- (iii) What is the probability that a call will be delayed for more than 10 sec?

Q.3 a. Describe the various propagation mechanisms which impacts propagation in a mobile communication system. **(8)**

b. Find linear block encoder G if code generator polynomial $g(x) = 1 + x + x^3$ for a (7,4) code. **(8)**

Q.4 a. If, 33 MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25 kHz simplex channels to provide full duplex voice & control channels. Compute the number of channels available per cell if a system uses:

- (i) Four-cell reuse
- (ii) Seven- cell reuse
- (iii) Twelve- cell reuse

If, 1 MHz is dedicated to control channels, determine distribution of control & voice channels in each cell for each of the three systems. **(8)**

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- b. Explain different types of Multiple Radio Access protocol. (8)
- Q.5** a. Briefly discuss various linear modulation techniques. (8)
- b. Describe Channel Allocation Strategies and also elaborate Static allocation and Dynamic allocation. (8)
- Q.6** a. Briefly explain the procedure to setup a call in a GSM network. (8)
- b. Briefly explain the following terms: (8)
- (i) Registration
 - (ii) Handoff parameters & underlying support
 - (iii) Roaming support
 - (iv) Multicasting
- Q.7** a. Explain GSM architecture in detail. (8)
- b. Describe forward CDMA channel in case of IS-95. (8)
- Q.8** a. Briefly describe Wireless Sensor Networks, its characteristics and applications. (8)
- b. Enumerate the various characteristics of MANET. (8)
- Q.9** Write short note: (4×4=16)
- (i) WMAN
 - (ii) WLAN
 - (iii) WPAN
 - (iv) Directional & smart antennas