WIRELESS COMMUNICATION (SEMESTER - 8)

CS/B.TECH (ECE-OLD)/SEM-8/EC-803(O)/09

1. ..... *Signature of Invigilator*

2. ..... *Signature of the Officer-in-Charge*

Reg. No. | | | | | | | | | | | | | | |

Roll No. of the Candidate | | | | | | | | | | | | | | |

CS/B.TECH (ECE-OLD)/SEM-8/EC-803(O)/09

ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL – 2009

WIRELESS COMMUNICATION (SEMESTER - 8)

Time : 3 Hours] [Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
   b) For **Groups – B** & **C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

	Group – A										Group – B			Group – C			***Total Marks***	***Examiner's Signature***
Question Number																		
Marks Obtained																		

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Head-Examiner/Co-Ordinator/Scrutineer

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GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10

i) A single frame in GSM frame structure consists of

a) 10 time slots b) 8 time slots

c) 7 time slots d) 4 time slots. ☐

ii) Accessing technique used in CDMA is

a) PDMA b) TDMA

c) CDMA d) both (a) and (b). ☐

iii) IS-95 is specified for reverse link operation in

a) 824-849 MHz b) 890-915 MHz

c) 935-960 MHz d) 800-825 MHz. ☐

iv) VSAT has power amplifiers, generally ranging from

a) 0·1 to 2 watts b) $\frac{1}{4}$ th to 4 watts

c) 5 to 8 watts d) 10 to 15 watts. ☐

v) In satellite communication the parameter known as Earth station 'figure of merit' is

a) G_r / T_s b) $KT_s B$

c) $P_t G_t$ d) $\lambda / 4\pi R$. ☐

vi) Bluetooth uses ..... in the physical layer.

a) FHSS b) DSSS

c) DHSS d) OFDM. ☐

vii) Satellite transponders generally use uplink and downlink frequency of

a) 6 HGz and 4 GHz b) 4 GHz and 6 GHz

c) 2 GHz and 4 GHz d) none of these. ☐

viii) IR (infrared) communication uses frequency range

a) MHz b) kHz

c) several Hz d) GHz. ☐

ix) When the mobile phone communicates with two sectors of one cell and one sector of another cell the hand-off is called

a) soft softer hand-off b) hard hand-off

c) softer hand-off d) soft hand-off. ☐

x) The Multiple Access Technique used in AMPS is

a) FDMA b) CDMA

c) TDMA d) FHMA. ☐

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Give a suitable proposal for DOWNLINK Design of Satellite Communication. 5

3. a) What do you mean by spread spectrum modulation ?

b) Write down the differences between 'direct sequence spread spectrum' and 'frequency hopping spread spectrum'. What is 'time hop' ? 2 + 2 + 1

4. a) What is cluster ? 1

b) Discuss about practical channel assignment strategies. 4

5. Prove that for a hexagonal geometry, the co-channel reuse ratio is given by $Q = \sqrt{(3N)}$ where $N = i^2 + ij + j^2$. 5

6. What is orbital perturbation ? How does it affect satellite communication ? 5

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following questions. 3 × 15 = 45

7. a) Draw and explain block diagram of Transponder. 6

b) Derive the general link design equation for a satellite. 7

c) What is the importance of 6/4 GHz system ? 2

8. a) Establish Friis transmission equation.

b) What is earth station's 'figure of merit' ?

c) If a transmitter produces 50 W of power, express the transmit power in dBm. If 50 W is applied to a unity gain antenna with a 900 MHz carrier frequency, find the received power in dBm at a free space distance of 100 m from the antenna. Assume unity gain for the receiver antenna. 6 + 4 + 5

9. a) Briefly explain the various types of interferences affecting the performance in a cellular mobile system. 6

b) Explain the various events that take place in a cell phone at the time of calling a friend and receiving a friend. 6

c) 'Every mobile device whenever it leave a cell, must be deauthenticated.' Explain.

10. a) Explain Packet Switching and Circuit Switching.

b) Why does 2·5 generation use both Packet Switching and Circuit Switching ?

c) Why are different coding mechanisms used in 2 G and 2·5 G ?

d) Why are more than 3 APS not placed at the same location ?

e) What is 4 G ? 3 + 3 + 4 + 2 + 3

11. Write short notes on any *three* of the following : 3 × 5

a) VSAT

b) Cordless Telephone System

c) Bluetooth

d) IR wireless LAN.

END