CS/B.Tech (EE)/(Supple)/SEM-8/EI-802B/09
REMOTE CONTROL & TELEMETRY (SEMESTER - 8)

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

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

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

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

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CS/B.Tech (EE)/(Supple)/SEM-8/EI-802B/09
ENGINEERING & MANAGEMENT EXAMINATIONS, JULY – 2009
REMOTE CONTROL & TELEMETRY (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				
Question Number																	***Total Marks***	***Examiner's Signature***
Marks Obtained																		

.....
Head-Examiner/Co-Ordinator/Scrutineer

S–53005 (27/07)

DO NOT WRITE ON THIS PAGE

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GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

i) Sampling in a PCM system is done by

a) Discriminator b) Sub-carrier oscillator

c) Sample-hold cricuit d) None of these.

ii) Frequency modulation in FDM system is usally accomplished with

a) Varactor b) Voltage controlled oscillator

c) PLL d) None of these.

iii) Which of the following is a microwave oscillator ?

a) 1·7 MHz b) 750 MHz

c) 0·98 GHz d) 22 GHz.

iv) A quantizer is a(n)

a) Multiplexer b) Demultiplexer

c) A/D Converter d) D/A Converter.

v) TDM requires

a) constant data transmission

b) transmission of data samples

c) transmission of data at random

d) transmission of data of only one measurand. ☐

vi) In FM the maximum modulating frequency is 15 kHz and the maximum frequency deviation is 75 kHz. The practical bandwidth is

a) 30 kHz b) 150 kHz

c) 180 kHz d) 240 kHz. ☐

vii) In FM telemetry as compared with AM telemetry requires a channel that is

a) smaller than what is required for AM telemetry

b) equal to that of AM telemetry

c) 10 times of that required for AM telemetry

d) 100 times of that required for AM telemetry. ☐

viii) If the frequency spectrum of a signal has a bandwidth of 500 Hz with the highest frequency at 600 Hz, what should be the sampling rate, according to the Nyquist theorem ?

a) 200 samples/s b) 500 samples/s

c) 1000 samples/s d) 1200 samples/s. ☐

ix) The maximum value of PCM signal is 31 and the minimum value is – 31, how many bits were used for coding ?

a) 4 b) 5

c) 6 d) 7.

x) The ratio of peak modulating voltage to the peak carrier voltage is referred to as

a) the voltage ratio b) decibels

c) the modulation index d) the mix factor.

xi) Transmitting data as serial binary words is called

a) Digital communication b) Quantizing

c) PAM d) PCM.

xii) Which oscillators are preferred for carrier generators because of good frequency stability ?

a) LC b) RC

c) LR d) Crystal.

GROUP – B

(Short Answer Type Questions)

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

2. a) What do you mean by Pulse Code Modulations (PCM) ? 2

b) What are the processes involved in generating PCM from an analog signal ? 3

3. a) Which type of reflector is used in conjunction with a horn radiator for both transmission & reception of microwave signal ? 2

b) What will be the gain of a parabolic antenna using a 5 m-diameter dish for microwave signal operating at a frequency of 10 GHz ? 3

4. a) State sampling theorem. 2

b) What are practical difficulties to recover the original signal from sampled signals ? 3

5. Draw the different waveform of the given message (1101001) using : 5 ∞ 1

a) AMI

b) NRZ

c) Manchester coding

d) Differential Manchester coding

e) CMI.

6. a) What are the different types of modulation codes used in telemetry system ? 2

b) What do you mean by source coding and line coding ? Explain with suitable example. 3

7. What are the BASK, BFSK and BPSK ? Describe with diagram needed. 5

GROUP – C

(Long Answer Type Questions)

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

8. a) Define the term 'telemetry'. Why is it necessary to use in an instrumentation system ? 4

b) Draw the block diagram of a general telemetry system. Explain the function of different block. 6

c) How is the voltage converted to frequency for use in telemetry system ? Explain with suitable diagram. 5

9. a) What is the difference between Time Division Multiplexing and Frequency Division Multiplexing in Telemetering system ? 3

b) Why is synchronizing necessary in TDM system ? Explain with proper circuit diagram, how a synchronizing pulse can be generated from a blank in the input synchronization channel. 2 + 4

c) Explain with proper diagram a TDM, PCM Telemetering link with encoder/decoder. 6

10. a) Draw the scheme of an optical fibre-based communication system. 3

b) What are the diferent types of loss mechanisms in fibre optical cable ? How can they be compensated ? 2 + 3

c) What is the critical angle of incidence and on what factors does it depend ? 1 + 2

d) Compare the advantages and disadvantages of different sources of light used in optical fibre telemetry system. 4

11. a) What do you mean by quantization of a signal ? 5

b) How is the resolution increased in a quantization method ? 2

c) What do you mean by ISDN ? 5

d) Give an idea about the motivation of ISDN. 1

e) Give the names of few new similar services of ISDN. 2

12. a) What do you mean by angular modulation ? How does frequency modulation differ from phase modulation ? 2 + 3

b) Write a brief note on the standards of base band configuration in terms of frequency as stipulated by IRIG for Telemetering. What do you mean by C.B.W. & P.B.W. in this context ? 6

c) If the modulating frequency change from 0.1 to 1 kHz by a factor of 10 and the peak carrier frequency deviation is 100 kHz, by what per cent does the band width change ? 4

13. Write short notes on the any *three* of the following : 3 ∞ 5

a) ISDN with different signal level coding

b) Pipeline telemetry

c) ASCII code

d) Supervisory telecontrol systems

e) Synchronous and asynchronous data communication.

END