REMOTE CONTROL & TELEMETRY (SEMESTER - 8)

CS/B.TECH(EE)/SEM-8/EI-802B/09

1. .....
Signature of Invigilator

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

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

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

CS/B.TECH(EE)/SEM-8/EI-802B/09

ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL – 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

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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

8879-B/F (27/04)

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SEMESTER - 8

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GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10

i) TDM requires

a) constant data transmission

b) transmission of data samples

c) transmission of data at random

d) transmission of data of only one measurement. ☐

ii) 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. ☐

iii) A buffer amplifier has a gain of

a) infinity

b) zero

c) unity

d) dependend upon the circuit parameters

e) none of these. ☐

iv) Guard band is essential in

a) FDM system b) TDM system

c) CDM system d) none of these. ☐

v) The process of conversion of analog signal to digital signal is

a) Encoding b) Decoding

c) Sampling d) Quantizing. ☐

vi) Modem is an acronym of

a) modulation b) demodulation

c) modulation and demodulation d) none of these. ☐

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

a) 4 b) 5

c) 6 d) 7

e) none of these. ☐

viii) In order to separate the channels in a TDM received it is necessary to use

a) AND gate b) Band-pass filter

c) integrator d) differentiator. ☐

ix) If there are 5 information pulses in 0·125 second, then the bit per second ratio (bpsr) is

a) 0·025 b) 0·625

c) 1·6 d) 40. ☐

x) Population inversion is a property found in

a) LED b) photodiode

c) FET d) LASER. ☐

xi) Which of the following is a micro-wave oscillator ?

a) 1·7 MHz b) 750 MHz

c) 0·98 GHz d) 22 GHz. ☐

GROUP – B

(Short Answer Type Questions)

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

2. What is the necessity of coding of signals ? Distinguish between source coding, line coding and channel coding. 2 + 3

3. Describe the significance of uniform sampling theorem.

4. What are BASK, BFSK and BPSK ? Describe with diagrams.

5. Describe briefly the sample and Hold Circuit for signal recovery.

6. Draw and explain FM modulator using a varactor diode.

GROUP – C

(Long Answer Type Questions)

Answer any *three* questions. 3 × 15 = 45

7. a) Draw the block diagram of TDM/PCM/FM telemetry system both on transmitting and receiving side. 8

   b) What do you mean by time frame in TDM-PM system ? 1

   c) Why synchronization is required in all TDM system ? Explain the operation of blank pulse, channel synchronization technique with suitable diagram and wave-form. 6

8. a) Amplitude of the frequency modulated wave remains constant at all times. Justify.

   b) Define modulation index for frequency modulation.

   c) Find the carrier and modulating frequency, modulation index and maximum deviation of the P.M. wave represented by

   $e_{fm} = 12 \sin (6 \times 10^{8} \ t + 5 \sin 1200 \ t) \ V$

   What power will the F.M. wave dissipate in a 10 ohm resistor ?

9. a) Draw and explain the block diagram of a frequency telemetry system. 5

   b) Write down the frequency ranges for 4 to 20 mA signal used in commercially available low cost telegraph and teletype communication channels. 2

   c) Draw and explain the block diagram of transmitter of a PCM system. 5

d) Discuss the advantages and disadvantages of PCM system. 3

10. a) Discuss the different aspects of designing a DAS. 5

b) Draw and explain the practical system of an 8-channel TDM-PAM telemetering transmitter system and draw the pulse waveforms at the outputs of the clock generator, counter, multivibrator and gates for one time-frame. 10

11. Write short notes on any *three* of the following : 3 × 5 = 15

i) ISDN with different signal level coding

ii) ASCII Code

iii) Landline telemetry system

iv) MODEM protocols

v) MA (Multiple Access) technique.

END