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2203N1704

Candidate's Seat No :_____

M.Sc. Semester-3 Examination

503

Physics

March-2024

Time : 2-30 Hours] **[Max. Marks : 70**

Instructions:

1. **Maximum Marks 70**
2. **Attempt all questions.**
3. **Symbols carry their usual meanings.**
4. **Scientific calculators are allowed**

Q.1 (A) Explain the following terms in detail [07]
a) Critical frequency of ionosphere
b) Virtual height of ionosphere
c) Maximum usable frequency

(B) Describe different orbits used for satellite communication, mention their merits and demerits. [07]

OR

Q.1 (A) Discuss, how ionosphere affect the wave propagation, Derive an expression for relative permittivity of ionosphere. [07]

(B) What is meant by station keeping? Why is it important?, how is it achieved? [07]

Q.2 (A) What are the major functions of satellite transponder? With help of a block diagram describe transponder. Mention power levels at various stages. [07]

(B) With help of a sketch, discuss various losses inherent to the glass fibers. [07]

OR

Q.2 (A) In connection with optical fiber communication, discuss the terms acceptance angle and numerical aperture. Obtain expressions for them. Mention their significances? [07]

(B) What do you understand by dispersion in optical fibers? What are the different types of dispersions associated with glass fibers? Describe any one in detail. [07]

Q.3 (A) Draw and discuss (i) A schematic of Microprocessor based system with bus architecture, and (ii) a block diagram of a computer with the Microprocessor as CPU. [07]

(B) Draw schematics of (i) 8085 Hardware model, (ii) Programming model, and (iii) Flag Registers. Describe various components briefly. [07]

OR

Q.3 (A) Discuss (i) Medium size computers, and (ii) Large computers. [07]

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(B) Discuss following instructions of the 8085 MPU with relevant examples. [07]
(i) Data transfer operations, (ii) Arithmetic operations, (iii) Logical operations, and (iv) Machine control operations.

Q.4 (A) Draw a block diagram of the 8085 Single Board Microcomputer system, and discuss various blocks of it. [07]

(B) Draw output waveforms of latch and positive-edge triggered flip-flop. Draw logic diagram of 74LS373 D-latch and functional table. [07]

OR

Q.4 (A) Draw schematics of a buffer and tri-state buffer with active low enable pin. Draw a logic diagram of the 74LS244 octal buffer and discuss how it works? [07]

(B) Draw functional block diagram of the 8085 MPU,discuss different blocks of it. [07]

Q.5 Attempt any **seven** questions [14]

(i) Distinguish between geosynchronous and geostationary orbits.

(ii) What do you understand by critical frequency of ionosphere?

(iii) Define Effective isotropic radiative power (EIRP) and figure of merit of a satellite?

(iv) Name two commonly used detectors in optical fiber communication systems.

(v) Draw index profile of a double cladded fiber.

(vi) What is the major advantage of single mode fiber?

(vii) The 8085 MPU has _____ bits control bus (Eight/ Sixteen)

(viii) The address bus is _____ (unidirectional/ bidirectional)

(ix) Memory of the 8085 MPU is a group of _____(registers/ diodes)

(x) The 74LS138 has _____input lines (03/04)

(xi) An assembly language used in the 8085 MPU is _____ level language (low/ high)

(xii) What is the function of a monitor program?

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