This question paper contains 4 printed pages]

Roll No.	100					
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S. No. of Question Paper : 106

Unique Paper Code : 32221303

Name of the Paper : Digital Systems and Applications

Name of the Course : B.Sc. (H) Physics CBCS

Semester : III

Duration: 3 Hours Maximum Marks: 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Question No. 1 is compulsory. Attempt any four from the rest.

Attempt five questions in all.

(Non-programmable scientific calculators are allowed)

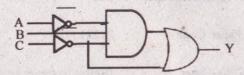
- 1. Answer any five of the following:
 - (a) Solve 11001 11100 using 2's complement method.
 - (b) Reduce the expression given below using Boolean Algebra

$$AB + \overline{AC} + \overline{ABC}(AB + C)$$

(c) What is the function of delay line in a C.R.O. ?

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(d) Write Boolean expressions for the following circuit:



- (e) Define what is SSI, MSI, LSI in an IC.
- (f) Distinguish between synchronous and asynchronous counter.
- (g) Define ROM, PROM and EPROM.
- (h) List any three functions which a microprocessor performs.
- 2. (a) Explain with an appropriate logic circuit the working ofa 4 bit adder subtractor.
 - (b) Simplify the expression using K-Map and draw its logic circuit using NAND gates:

$$F = \Sigma m(0, 1, 4, 6, 8, 9, 11) + d(2, 7, 13)$$

(a) Draw the circuit for a monostable multivibrator using IC555 and explain its operation. Derive an expression for the time period of the output waveform. Give one application of monostable multivibrator.

- (b) Draw a labelled block diagram of CRO. What is the function of time-base circuit in CRO. How is the CRO used for frequency determination?
- 4. (a) What are decoders? Draw and explain the working of a 3 to 8 line decoder.
 - (b) Draw the circuit of a 4 bit shift left register with parallel loading and explain its working.
 - (c) What do you understand by parity? Describe a method for generating odd parity.
- 5. (a) What is a flip flop? Explain the working of RS flip flop.

 How the racing condition is avoided in a J K master slave flip flop?
 - (b) Design an asynchronous decade counter. Explain the working of a ring counter as a periodic switch. 7
- 6. (a) What is the function of the following:
 - (i) Program counter
 - (ii) Stack Pointer.
 - (b) Describe different addressing modes available in 8085 microprocessor. Give one example of each addressing mode.
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(4)

(c)	Describe the various flags used in 8085 microprocessor							
	and show their bit position. What is the mnemonic of an							
	instruction that uses AC flag.							

- 7. (a) Write a program to add the two hex numbers: A5, 98.

 Store the sum in memory location 200AH and carry in 200BH.
 - (b) Write the classification of instructions for 8085 μP. Explain
 briefly different instructions of the branch group.
 - (c) How is de-multiplexing of address and data buses done in 8085 μP ? Explain with the help of timing diagram.