Seat No. : _____

XA-136

T.Y.B.Sc.
March-2013

Electronics : Paper – VII

(Digital Electronics and Microprocessor)

Time : 3 Hours] **[Max. Marks : 70**

Instructions : (1) **All** questions carry equal marks.

(2) Symbols used here have their usual meanings.

(3) **All** questions are compulsory.

1. (a) Draw the circuit of astable multivibrator using IC555 timer and explain its operation. **6**

OR

Explain Schmitt Trigger in detail with the help of its transfer characteristics. Sketch the output voltage, when a sine wave with a peak of 2 V drives one of the inverters in a 7414.

(b) Explain with neat logic diagram 8-bit serial in-parallel out shift register. **6**

OR

Explain how shift register can be used for serial addition of two 8-bit numbers.

(c) Attempt any **two :** **2**

(i) Define Duty Cycle

(ii) What is Clock ?

(iii) Is a 74LS91 register sensitive to PTs or to NTs ?

(iv) Why does the 7495A have two separate clock inputs ?

2. (a) With the help of logic diagram and truth table explain 3-bit binary ripple counter. **6**

OR

Explain Moore & Mealy model for designing of synchronous sequential logic circuit.

(b) With the help of logic diagram, wave forms and truth table explain Mod-3 counter. **6**

OR

Explain Mealy model and give their state transition diagram of sequence detector.

(c) Attempt any **two :** **2**

(i) What is modulus of a counter ?

(ii) How many flip-flops are required to construct a Mod-32 counter ?

(iii) What is the largest decimal number that can be stored in a Mod-128 counter ?

(iv) What do you understand by glitch ?

3. (a) Explain Registers, Accumulator, Flags, PG & SP of 8085 Programming model. **6**

OR

Explain the 8085 timing diagram for execution of 'OUT' instruction.

(b) Explain the differences between the Memory-Mapped I/O & Peripheral-Mapped I/O. **6**

OR

Write a program to perform the following functions and verify the output :

Load 02H in register D, load 03H in register C, Increment register C by one, add the contents of register C and D and display the sum at the 2500H.

(c) Attempt any **two :** **2**

(i) Give an example of 3-byte instruction.

(ii) Which instruction is used to mask off Least Significant 4-bits of an 8-bit number ?

(iii) In Memory-Mapped I/O technique which control signals are used ?

(iv) The 8085 performs subtraction by using the method of _____.

4. (a) Four bytes of data are stored in memory locations at DA21H to DA24H. Write a program to transfer the entire block of data to new memory location EA21H.

Data (H) : 03, 01, 19, 43 **6**

OR

Write a program to generate time delay using one register. Assume delay register is loaded by FFH & the clock frequency is 1 MHz.

(b) Three bytes of data are stored in memory locations starting at EB31H. Add all the data bytes. Use register B to save any carries generated, while adding the data bytes. Display the entire sum at two consecutive memory locations DB31H and DB32H. **6**

Data (H) : 16, 03, 42

OR

Explain the Restart, Conditional Call and Return Instructions in detail.

(c) Attempt any **two :** **2**

(i) What do you mean by continuous loop ?

(ii) Stack uses which concept FIFO or LIFO ?

(iii) Which two instructions are needed for subroutine ?

(iv) Explain the term : Nesting.

5. (a) A binary number is stored in memory location BINBYT. Convert the number in BCD and store each BCD as two unpacked BCD digits in the Output Buffer. To perform this task, write a main program and two subroutines : one to supply the powers of ten and the other to perform the conversion. Assume binary number 1111 1111. **6**

OR

With the help of block diagram and control word format explain 8255A PPI in detail.

(b) What is DAC ? Explain weighted DAC in detail, when digital data is 1111. **6**

OR

Make control word for the following arrangement of the ports of 8255 for Mode 0 operation :

Port A, Port B, Port C_u and Port C_L as output ports.

(c) Attempt any **two :** **2**

(i) What is the full form of ASCII ?

(iii) Define the XCHG instruction.

(iii) What does BSR stand for ?

(iv) What is Quantization ?

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