* M C C - 0 0 3 - 1 1 5 2 0 0 4 - 5 0 - 2 *

MCC-003-1152004

Seat No. _____

M. Sc. (Ele.) (Sem. II) (CBCS) Examination

April / May - 2018

Paper - VIII : Advanced Digital Electronics

Faculty Code : 003
Subject Code : 1152004

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

1 Answer the following : (any seven out of ten) **2×7=14**

(1) Two T type flipflops are in cascaded arrangement. If the input frequency of FF1 is 100 KHz, How much time will it take to get output from FF2 ?

(2) For presettable and clearable J-K FF with active high J-K inputs and active low preset-clear inputs, what would be the logic status of Q output when
   (a) J = 1, K = 1, Preset = 0, Clear = 1
   (b) J = 1, K = 0, Preset = 1, Clear = 1

(3) Determine the size of PROM required for implementing the following logic circuits.
   (a) 4 bit binary adder/subtractor with a control input for selection of operation.
   (b) 16 to 1 multiplexer

(4) Explain the microprocessor 8085's instructions
   (a) STA 4300 H (b) MVI A, FFH

(5) Implement Boolean expression $f(A, B, C) = \sum(2, 3, 4, 6)$ using MUX 8 to 1.

(6) In the 4 bit binary counter, P, Q, R, S are outputs. [P = MSB and S = LSB) The output of NAND gate is connected with the clear of all the flipflops. If the inputs of NAND gates are P & R, find the MOD of the counter.

(7) Write the truth table of J-K Flipflop.

(8) Write the count sequence for MOD 12 binary down counter.

(9) 4 bit Ring counter is clocked by 10 MHz. Determine the output frequency.

(10) Write the PROS and CONS of PLDs. (2 points each)

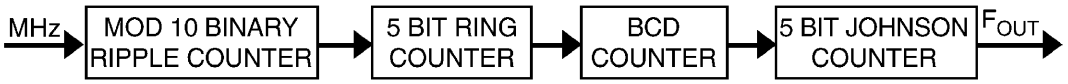
2 Answer the following : (any 2 out of 3 from a, b and c). **14**

(a) Write an ALP to find the 2's complement of a given number that is stored at 2300 H. Store the result at 2301 H. **5**

(b) What are glitches ? How do you overcome it ? **5**

(c) Write the truth table of Full adder. Implement it using suitable PROM. **5**

(d) Compulsory question. **4**
For the following multistage counters arrangement, explain and find the F_{OUT}.



3 Answer the following : **14**

(a) Design SYNCHRONOUS 4 bit binary counter. **7**
Explain logic diagram, operations and timing waveforms.

(b) Explain general purpose Registers and Flag register of microprocesor 8085. **7**

OR

3 (a) Draw the flowchart and then write an ALP for addition of TEN 8 bits data that are stored starting from 2100 H. The results are stored at 4000 H and 4001 H (carry). **7**

(b) Explain in detail the instructions that are used to shift accumulator's data. **7**

4 Answer the following : **14**

(a) Design and explain BCD adder circuit using ICs 7483 and 7486. **7**

(b) Draw the internal architecture of microprocessor 8085. **7**

5 Answer the following : (any two out of four) **14**

(a) Explain the interrupts of 8085 in detail. **7**

(b) Design and explain 4 bit universal shift register. **7**

(c) Design and explain in detail 4 bit Johnson Counter. **7**

(d) Implement the following Boolean expression using PLA. **7**

F_1 (A,B,C,D) = $\sum$(0, 5, 10, 15)

F_2 (A, B, C, D) = $\sum$(1, 2, 3, 6, 7, 11)

F_3 (A, B, C, D) = $\sum$(4, 8, 9, 12, 13, 14)