2609N531

Candidate's Seat No :_____

M.Sc Sem.-4 (Rep) Examination

509

Physics

September-2024

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

Q.1 (A) Assume that Register pair of 8085 Microprocessor HL holds the data 4567 H, and an Accumulator holds data 34 H. Illustrate the results of the instructions DCR H, DCX H, INR H, INX H, ANA H, ORA H, XRA H and CMA. Write program to perform ANDing, ORing, Ex-ORing and compliment (A) operations. Show the status of sign, zero and carry flags after each operation. [07]

(B) List the difference between continuous and conditional loops. Write a program and draw a flow chart to transfer sixteen data bytes which are stored in memory locations at 6050H to 605F H. Assume destination memory locations starting at 2070 H. [07]

Data (H):, 25, 22, 41, 36, 25, E4, 28, 79, 31, 37, 51, 50, 12, 19, A0, 32

OR

Q.1 (A) Assume that six data bytes are stored in memory location starting from 6020H. Write a program and draw a flow chart to add all the bytes. Set up B as carry register to save any carries generated, while adding data bytes. Store sum at two consecutive memory locations 6050H and 6051H. [07]

Data(H): 10,32,21, 34, 60,44

(B) Assume that the accumulator holds 44 H and CY=0. Illustrate the Accumulator contents after the execution of instruction RAR, RRC twice. [07]

Q.2 (A) Write a program for down counter to count from 9 to 0 with one second delay between each count. After the count of 0, the counter should go to 9 and repeat the sequence continuously. Use register pair HL to set up a delay and display each count at one of the output ports. (Clock frequency of system is 1 MHz, T-state of inner loop = 24 and outer loop = 45). [07]

(B) Discuss an advanced subroutine concept with (i) Multiple calling of subroutine, (ii) Nesting and (iii) Multiple ending of subroutines. [07]

OR

Q.2 (A) Write a program to generate continuous square waveforms with the period (T) of 500 μs. Assume system frequency is 3 MH, use bit D_0 to output to square wave (T-states of outer loop = 46, and inner loop = 11) [07]

(B) Write a program for multiplication of two 8-bit unsigned number having following problem statement [07]

A multiplicand is stored in memory location 6050 H and a multiplier stored in location 6051 H. Write a main program to

(i) transfer the two numbers from memory locations to the HL register

(ii) store the product in the Output Buffer at 6090H
Write subroutine to
(i) multiply two unsigned numbers placed in registers H and L
(ii) return the result in the HL pair.

Q.3 (A) Draw a schematic diagram of a two cavity klystron. Describe it's construction and working. [07]

(B) What is Gunn diode? Explain electron transfer effect in Gunn diode using two valley theory. [07]

OR

Q.3 (A) What is READ diode? Describe its construction. Explain mechanism of oscillations in it. [07]

(B) With the help of a neat diagram explain construction and working of a multicavity cylindrical magnetron. [07]

Q.4 (A) Define 'S' parameters of a two port microwave network? Obtain the scattering matrix for H-plane tee. [07]

(B) Describe slotted line method of measuring unknown frequency of a microwave generator. [07]

OR

Q.4 (A) Explain structure and working of Magic tee. [07]

(B) What is directional coupler? What are its types? Draw their structures. Explain working of a two hole directional coupler. [07]

Q.5 Answer in brief Any Seven questions from the following: (Each question is of two marks). [14]

(i) What are mode curves?
(ii) Define directivity of a directional coupler?
(iii) A reflex klystron operates at the peak mode of n = 2 with beam voltage V_0 = 300 V. Beam current I_0 = 20 mA. Efficiency of the klystron is 22.7 %. What will be its AC output power?
(iv) What is circulator?
(v) What is Gyrator?
(vi) What are the applications of microwave attenuators?
(vii) List various types of 8-bit Register of 8085 MPU.
(viii) RET is ____byte instruction
(ix) Write two machine control instructions
(x) List the difference between PUSH and POP instructions.
(xi) List two common sources of error in programs.
(xii) What is a 'stack'?

*** PAPER ENDS***