2/91

1504E202

Candidate's Seat No :_____

M.Sc. Sem.-4 Examination

509

Physics

April-2025

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

Q.1 (A) Write a program and draw a flow chart to subtract 97 H from 65H stored in accumulator and register B respectively. Show steps of subtraction using 2's compliment method. Write status of sign, zero and carry flag. [07]

(B) Discuss programming techniques: Looping, Counting and Indexing. Write instruction to load 7FH data byte to the memory location 2050H. Also write instructions to transfer data byte to the accumulator using three different Opcodes: MOV, LDAX, LDA, out of these which instruction is better and why? [07]

OR

Q.1 (A) Write a program and draw a flow chart to perform addition of two numbers 8B H and 6F H stored in Registers C and D respectively and store sum in register C. Write status of sign, zero and carry flag. [07]

(B) Sixteen bytes of data are stored in memory locations at 2050H to 205FH. Write a program and draw a flow chart to transfer the entire block of data to new memory locations starting at 2070H. [07]

Data (H): 98, 19, 10, 2C, 7A, 8B, E5, DA, 7F, 5A, 75, 28, 2F, 37, 44, 16

Q.2 (A) Discuss following advanced subroutine concepts with relevant schematic diagram. (i) Multiple calling of a subroutine, (ii) Nesting and (iii) Multiple ending subroutines [07]

(B) Write a program and draw a flow chart to generate a continuous square wave with the period of 500 micro second. The system clock period is 350 n sec. and use bit D_0 to output to the square wave. (Number of T-state of outer loop = 46, Number of T-state of an inner loop is 14- during last cycle, and 11 before last cycle). [07]

OR

Q.2 (A) Write a program and draw the flow chart for a continuous down Modulo ten counter to count from Nine to Zero with a one second delay between each count. Use register pair DE to set up one second delay and display each count at one of the output ports. Clock frequency of the system is 1.5 MHz (No. of T-state of an inner loop is 24 and an outer loop is 48). [07]

(B) Write steps to perform addition of two packed BCD numbers: 54 and 48
Write steps to perform subtraction of two packed BCD numbers: 65 and 35 [07]

(P.T.O)

Q.3 (A) Draw a schematic diagram of reflex klystron tube. Explain its construction, and operation. [07]

(B) Write short notes on: [07]

(i) π – modes in magnetron.

(ii) Read diode

OR

Q.3 (A) Differentiate between a klystron and a TWT. Draw a schematic diagram of the helix type travelling wave tube and explain its construction. [07]

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

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

(B) What is magic tee? Describe it's construction and working. [07]

OR

Q.4 (A) Write short notes on: [07]

(i) Microwave circulator

(ii) Directional couplers

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

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

(i) What do you understand by Masking of data?

(ii) List the diffidence between static and dynamic debugging

(iii) (A) = 55H and CY=0, after twice RAR (A)=

(iv) Write diffidence between CALL and RET instructions

(v) Explain instructions: XTHL and PCHL

(vi) Convert 72 BCD number to its binary equivalent

(vii) Explain briefly: mode curves of a reflex klystron.

(viii) What is READ diode?

(ix) What are bolometers?

(x) What is Gyrator? State its application.

(xi) Define directivity of a directional coupler. What is the directivity of an ideal directional coupler?

(xii) Why the side arm of H-plane tee is called adder arm?

***** PAPER ENDS *****