

M.Sc. 4th Semester Examination, 2024

ELECTRONICS

(Microprocessor and its Applications)

PAPER – ELC-402(Old)

Full Marks : 50

Time : 2 hours

Answer **all** questions

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

GROUP – A

Answer any **four** questions : 2×4

1. The address capability of 8085 microprocessor is 64KB. Explain.

(Turn Over)

2. Explain the need to demultiplex the bus $AD_7 - AD_0$.
3. What are the different instruction word sizes in 8085 ? Give one example of different word sized instructions. 1 + 1
4. Indicate the nature of signals that will trigger TRAP, RST 7.5, RST 6.5, RST 5.5 and INTR.
5. Differentiate microprocessor and microcontroller.
6. Explain the physical address formation in 8086 microprocessor.

GROUP – B

Answer any **four** questions : 4 × 4

7. How does 8085 microprocessor generate appropriate control signals to interface memory and I/O ?

8. Explain the I/O real machine cycle.
9. Mention different addressing modes of 8085 and give one example for each. 2 + 2
10. Explain the instructions : RAL and RLC. 2 + 2
11. Mention the similarities and differences of the instructions CALL and RET with the instructions PUSH and POP.
12. List the features of Intel 8051.

GROUP – C

Answer any two questions : 8 × 2

13. (i) Draw the functional block diagram of 8085 microprocessor.
- (ii) Write an assembly language program for :
A block of six data is stored in the memory location from 8055H to 805AH. Transfer the data to the location 8080H to 8085H in the reverse order. 4 + 4

14. Draw the block diagram of PPI 8255. Show its control word format for I/O mode of operation. 4 + 4
15. Draw the architecture of 8051. Explain the function of Program Status Word (PSW) register of 8051. 5 + 3
16. Explain the physical memory organization of 8086. Draw and discuss flag register of 8086. 4 + 4

[Internal Assessment – 10 Marks]

M.Sc. 4th Semester Examination, 2024**ELECTRONICS***(Control Systems and Instrumentation)*

PAPER – ELC-403(Old)

*Full Marks : 50**Time : 2 hours*Answer **all** questions*The figures in the right hand margin indicate marks**Candidates are required to give their answers in their own words as far as practicable***GROUP – A**Answer any **four** questions : 2 × 4

1. The open loop transfer function of a control system is given by $\frac{(s+5)}{(s+2)(s+3)}$ and $H(s) = 1$. Determine the characteristic equation.

(Turn Over)

2. What is the difference between open loop control system and closed loop control system ?
3. Depending upon the damping ratio, mention the names of different control systems.
4. Mention two applications of CRO.
5. A system transfer function is given by

$$\frac{(s+2)}{s^3(s+4)(s+1)}$$

Find out the type and order of the system.

1 + 1

6. The characteristic equation of a control system is given by $s^4 + 5s^3 + 4s^2 + 3s + 1 = 0$. Determine the stability of the system.

GROUP – B

Answer any **four** questions :

4 × 4

7. A feedback system is described by the following transfer function

$$G(s) = \frac{12}{s^2 + 4s + 16}, H(s) = Ks.$$

The damping factor of the system is 0.8. Determine the overshoot of the system and value of K .

2 + 2

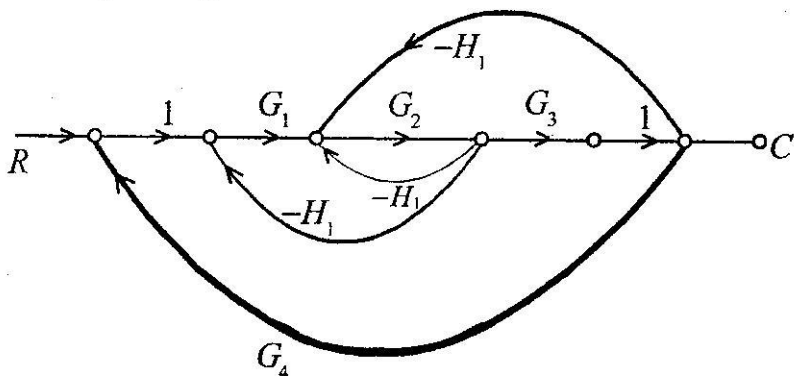
8. The forward path transfer function of a unity feedback control system is given by

$$G(s) = \frac{5(s^2 + 2s + 100)}{s^2(s + 5)(s^2 + 3s + 10)}$$

Determine the step and ramp co-efficient.

2 + 2

9. Determine the overall transfer function of the system given below



10. The characteristic equation of the system is given by $2s^4 + 2s^3 + s^2 + 3s + 2 = 0$. Determine the stability of the system.
11. Define transducer. Differentiate between active and passive transducer. 2 + 2
12. Draw the block diagram of function generator and mention its different block. 2 + 2

GROUP – C

Answer any two questions : 8 × 2

13. The open loop transfer function of a unity feedback control system is given by

$$G(s) = \frac{K}{(s+2)(s+4)(s^2+6s+25)}$$

By applying Routh criterion, discuss the stability of the closed loop system as a function of K. What is the oscillation of the frequency of the system ? 6 + 2

14. Draw the Bode plot of the open loop transfer function

$$G(s) = \frac{(s + 10)}{(s + 5)(s + 20)}$$

15. Write short note on instrumentation amplifier.

16. Draw and explain Cathode Ray Oscillator.

3 + 5

[Internal Assessment — 10 Marks]
