QP CODE: 22001781

22001781

Reg No : .....

Name : .....

M Sc DEGREE (CSS) EXAMINATION, AUGUST 2022

Fourth Semester

M Sc PHYSICS

Elective - PH800402 - MICRO ELECTRONICS AND SEMICONDUCTOR DEVICES

2019 ADMISSION ONWARDS

69AA9136

Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Address bus is unidirectional but data bus is bidirectional .Why?
2. What is the difference between ROM and RAM ?
3. Draw the 8085 functional block diagram.
4. How is a segment register different from a segment in microprocessor 8086?
5. Explain based addressing mode in 8086 microprocessor. Give example.
6. What are the unique features of microcontrollers that distinguish them from microprocessors?
7. Why is a low address byte latch used for external memory in 8051 microcontroller?
8. What are the characteristics of an embedded system.
9. Describe the function performed by each mask in photoetching process.
10. Compare the diffusion coefficients for the same temperature for antimony, arsenic, gallium, Aluminium and boron.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Explain different addressing modes used in 8085.
12. Explain the various arithmetic instructions of 8086 with examples.
13. Write an 8086 program to sort an array of ten bytes in descending order. Add comments to your Program.
14. Describe memory bank selection in 8086 microprocessor and mention the number of memory bank in 8086.

15. Discuss the various data transfer instructions in 8051 microcontroller with examples.

16. Calculate the reverse saturation current densities of a Schottky barrier diode and the pn junction diode for a tungsten barrier on silicon with a measured barrier height of 0.67 eV. (The effective Richardson constant is 114 A/K^2, T=300K, $D_p=10cm^2/s$, $D_n=25cm^2/s$, $L_p=10^{-3}cm$, $L_n=1.58x10^{-3}cm$, $P_{no}=2.25x10^4\ cm^{-3}$ and $n_{po}=2.25x10^2\ cm^{-3}$).

17. Explain anisotype and isotope heterojunction using energy band diagram.

18. Sketch the equivalent circuit of a base diffused resistor, showing all parasitic elements. What must be done externally to minimize the effect of the parasitic elements?

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Describe the basic I/O techniques used by microcomputer to transfer data between microcomputer and external device.

20. What are interrupts? Explain about different types of interrupts? With suitable bit assignment explain the functioning of special function registers used for interrupts?

21. Discuss the metal semiconductor ohmic contact. Describe the two general types of ohmic contacts.

22. (a) What are the isolation methods employed in the fabrication of IC (b) Explain large scale and medium scale integration.

(2×5=10 weightage)