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Reg. No.....

Name.....

M.Sc. DEGREE (C.S.S.) EXAMINATION, JANUARY 2024

Third Semester

Faculty of Science

Branch II—Physics—(A)—Pure Physics

Elective : Bunch (A) : Electronics

PH 3EA2—MICROELECTRONICS AND SEMICONDUCTOR DEVICES

(2018 Admissions—Supplementary/2017, 2016 and 2015 Admissions—Mercy Chance)

Time : Three Hours Maximum Weight : 30

Part A

Answer any **six** *questions.*

Each question carries 1 *weight*

1. Write a note on Cache memory.
2. State the significance of flash memory.
3. What are the different types of instructions in 8086 microprocessor ?
4. What is the difference between the microprocessor and microcontroller ?
5. Give the register set of intel 8051 microcontroller.
6. What is Coprocessor ?
7. Explain in brief the applications of microcontrollers.
8. Give the applications of Schottky diode.
9. Differentiate between Schottky diode and conventional diode.
10. What is two dimensional electron gas? Explain.

(6 × 1 = 6)

Turn over

Part B

Answer any **four** *questions.*

Each question carries 2 *weight.*

11. Explain the various addressing modes in 8086 processor.

12. Draw and explain the memory structure of 8085 processor.

13. State the Assembler Directives used in 8086 programming and describe the function of any *two*.

14. How can an I/O pin can be both an input and output in 8051 microcontroller ? Explain.

15. Explain Schottky barrier with the help of a band diagram.

16. Obtain the current voltage characteristics of a Schottky diode.

(4 × 2 = 8)

Part C

Answer **all** *questions.*

Each question carries 4 *weight.*

17. (a) Draw and explain the timing diagram for memory read operation of 8085 processor.

Or

(b) What is DMA ? Which hardware pins are used for DMA control? Draw and explain the architecture of 8237 DMA controller.

18. (a) Draw the 8086 internal architecture and explain.

Or

(b) Write an 8086 Assembly Language Program to find the sum of numbers in an array of 10 element.

19. (a) With the necessary diagram of control word format, explain the various operating modes of timer in 8051 microcontroller.

Or

(b) Explain the arithmetic and control instructions of 8051 microcontroller.

20. (a) Discuss the significance of the tunnelling barrier in Schottky barrier diodes.

Or

(b) Discuss the concept of ideal non-rectifying barriers in Schottky barrier diodes ?

(4 × 4 = 16)