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Reg. No.....

Name.....

M.Sc. DEGREE (C.S.S.) EXAMINATION, FEBRUARY 2021

Third Semester

Faculty of Science

Branch II—Physics–A–Pure Physics

Elective : Bunch A–Electronics

PH 3E A2—MICROELECTRONICS AND SEMICONDUCTOR DEVICES

(2012—2018 Admissions)

Time : Three Hours Maximum Weight : 30

Part A

Answer any **six** *questions.*
Weight 1 *each.*

1. What is a microprocessor ?
2. Discuss the function of ALU of 8085.
3. Write notes on fetch operation and execute operation.
4. What are the general purpose registers in 8086 ?
5. How many operating modes does 8086 have ? Discuss them in brief.
6. What are LOCK and $\overline{\text{LOCK}}$? Discuss their roles.
7. What is the function of watch-dog timer ?
8. What are the different operating modes of SCON of 8051 microcontroller ?
9. What are the interrupts used in 8051 microcontroller ?
10. What is Schottky barrier diode ?

(6 × 1 = 6)

Turn over

Part B

Answer any **four** *questions.*
Weight 2 *each.*

11. Write an 8085 assembly language programme to add two 8-bit numbers. The result may be of 16-bits.

12. Compare memory mapped I/O and peripheral mapped I/O.

13. Give the PSW of 8051 and describe the use of each bit in PSW.

14. Write an 8086 assembly language programme to check whether the given string is palindrome or not.

15. Write a programme to bring data in serial form and send it out in parallel form using 8051.

16. The Schottky barrier height of a Si Schottky junction is φ_{Bn} = 0.59V, the effective Richardson constant is A* = 114 A/K^2 -cm^2 and the cross-sectional area is 10^{-4} cm^2. For T = 300K, calculate the ideal reverse-saturation current.

(4 × 2 = 8)

Part C

Answer **all** *questions.*
Weight 4 *each.*

17. (a) Describe the functional pin diagram of 8085.

Or

(b) Explain the Different types of instruction in 8085.

18. (a) Discuss the maximum mode configuration of 8086 with a neat diagram. Mention the functions of various signals.

Or

(b) Explain the interrupt mechanism, types and priority of 8086 microprocessor.

19. (a) Describe the different modes of operation of timers/counters in 8051 with its associated register.

Or

(b) Describe the architecture of 8051 with neat diagram.

20. (a) Describe the energy-band diagram of hetero-junction materials and explain the two-dimensional electron gas.

Or

(b) Discuss about ideal non-rectifying barriers and tunneling barriers.

(4 × 4 = 16)