**19002095**

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**Reg. No.....**

**Name.....**

**M.Sc. DEGREE (C.S.S.) EXAMINATION, NOVEMBER 2019**

**Third Semester**

Faculty of Science

Branch II : Physics—A—Pure Physics

Elective : Bunch A—Electronics

PH3EA2—MICROELECTRONICS AND SEMICONDUCTOR DEVICES

(2012—2018 Admissions)

Time : Three Hours Maximum Weight : 30

**Part A**

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

1. Differentiate hardware interrupts and software interrupts.
2. What is masking ? Why it is needed ?
3. What is meant by multiprogramming ?
4. Write a 16-bit delay programme in 8086.
5. Discuss the function of instruction queue in 8086 ?
6. What are the different flag available in status register of 8086 ?
7. How to set 8051 in idle mode ?
8. Name the five interrupt sources of 8051.
9. What is the difference between the Microprocessors and Microcontrollers ?
10. What is tunneling effect ?

(6 × 1= 6)

**Part B**

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

11. Write an 8085 assembly language programme to find out the smallest number in an array.
12. Draw the timing diagram of op-code fetch cycle in 8085.

**Turn over**

13. Draw the structure of 8086 flag register and explain the function of the flags with examples.

14. Write an 8086 assembly language programme to convert BCD data to binary data.

15. Describe the 8051 I/O port structure.

16. Consider a contact between tungsten and n-type Si doped to $10^{16}cm^{-3}$ at T = 300K.

    Calculate the theoretical barrier height, built-in potential barrier and maximum electric field this metal-semiconductor contact under zero bias. Given, work function for tungsten = 4.55 V and electron affinity for Si = 4.01V.

(4 × 2 = 8)

## Part C

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

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

*Or*

(b) Explain the addressing modes of 8085 with example.

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) What is a hetero-junction ? Discuss about the energy band diagram and the two-dimensional electron gas.

*Or*

(b) Discuss about the non-ideal effects on the Schottky barrier height.

(4 × 4 = 16)