

M.Sc. DEGREE (CSS) EXAMINATION, JANUARY 2016**Third Semester**

Faculty of Science

Branch : II – Physics – A – Pure Physics

Elective : Bunch A – Electronics

PH 3E A2 – MICROELECTRONICS AND SEMICONDUCTOR DEVICES

(2012 Admission onwards)

Time : Three Hours

Maximum Weight : 30

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

1. What is the purpose of the microprocessor in a microprocessor based computer?
2. Explain how CALL instruction function.
3. Write an assembly language program to find the square of a number.
4. Illustrate with example one byte and two byte instruction.
5. What is meant by address space?
6. Discuss Interrupt priority.
7. What are the features of Intel 8087?
8. What is the ideal Schottkey barrier height? Indicate the Schott key barrier height on an energy band diagram.
9. List the conditional instructions for jump.
10. Write a note on flash memory.

(6 × 1 = 6)

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

11. Differentiate immediate addressing and direct addressing.
12. Write a program that read any decimal number between 0 and 2G and display the 16-bit binary version.

Turn over

13. $DL = 0F3H$ and $BH = 72H$ Subtract BH from DL . Show the content of flag register.
14. Compare microprocessor and microcontroller.
15. Explain the 8051 microcontroller timers/counters $T0$ and $T1$.
16. Explain what is meant by two dimensional electron gases.

(4 × 2 = 8)

Part C

Answer all questions.

Weight 4 each.

17. (a) Discuss special purpose and general purpose registers of Intel 8086.

Or

- (b) (i) Draw the internal architecture of 8086.
(ii) The original contents of AX , BL , word-sized memory location SUM , and carry flag CF are $1234H$, ABH , $00CDH$, and $0H$, respectively. Describe the results of executing the following sequence of instructions :

ADD AX , $[SUM]$

ADC BL , $05H$

INC WORD PTR $[SUM]$

18. (a) With suitable examples, explain the various addressing modes of 8086.

Or

- (b) Explain the operation of all data movement instructions of 8086.

19. (a) Explain memory organization and register set of 8051.

Or

- (b) Explain the important operational features of 8051.

20. (a) Explain the basic concepts concerning the hetero junction including energy band diagram and equilibrium Electrostatics.

Or

- (b) Sketch and explain the energy band diagram of a tunnelling junction. Explain metal-semiconductor ohmic contact.

(4 × 4 = 16)