

F 6527

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Reg. No.....

Name.....

M.Sc. DEGREE (CSS) EXAMINATION, JANUARY 2015

Third Semester

Faculty of Science

Branch : II—Physics—A—Pure Physics

Elective Bunch A—Electronics

PH3EA2—MICROELECTRONICS AND SEMICONDUCTOR DEVICES

(2012 Admission onwards)

Time : Three Hours

Maximum Weight : 30

Part A

Answer any six questions.

Weight 1 each.

1. List the 16-bit register that are used for register addressing.
2. What is a label ?
3. What are the instructions available in 8086 to manipulate on stack and stack pointer ?
4. Shortly explain DMA.
5. What is meant by address space partitioning ?
6. List the special function registers of 8051.
7. Write the opcode that move the data between the locations within the 8051.
8. What is the function of a co-processor ?
9. Describe the charge flow in forward- biased Schottkey Barrier Diode.
10. Write a program to subtract the content of memory location 2101H from the content of memory location 2100H and place the result in 2102H location with minimum number of instructions.

(6 × 1 = 6)

Part B

Answer any four questions.

Weight 2 each.

11. Explain flag registers of 8086 with block diagram.
12. Explain the operational difference between PUSH and POP instruction.
13. Write a note on virtual memory and cache memory.
14. Compare microprocessor and microcontroller. Write the applications of microcontroller.

Turn over

15. Write a note on 8051 Microcontroller Interrupts.
16. Consider a contact between tungsten and n type silicon doped to $N_d = 10^6 \text{ cm}^{-3}$ at 300 K. Calculate the theoretical barrier height, built in potential barrier and maximum electric field in a metal semiconductor diode for zero applied bias. Given work function of tungsten = 4.55 V and electron affinity for silicon is 4.01V.

(4 × 2 = 8)

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

17. (a) Briefly explain the programming model of Intel 8086. with a neat block diagram.

Or

- (b) Explain the possible variations of data addressing modes using MOV instruction.

18. (a) Explain pin out description of 8051.

Or

- (b) Explain the basic ideas of embedded system.

19. (a) Explain the process of interfacing memory and I/O devices to microprocessor.

Or

- (b) Explain the important 8086 Pin diagram and describe each.

20. (a) (i) - Compare Schottkey Barrier diode and p-n Junction diode.

- (ii) Describe the energy band diagram of hetero junction materials.

Or

- (b) Explain ideal non-rectifying barriers and tunneling barriers.

(4 × 4 = 16)