

Reg. No

Name

17P3644

MSc DEGREE END SEMESTER EXAMINATION- OCTOBER-NOVEMBER 2017

SEMESTER 3 : PHYSICS

COURSE : 16P3PHYT11EL ; MICROELECTRONICS AND SEMICONDUCTOR DEVICES

(For Regular - 2016 admission)

Time : Three Hours

Max. Marks: 75

Section A

Answer any 5 (1 marks each)

1. LDAX B is an example of addressing mode
(a) Direct (b) Register (c) Register Indirect (d) Implied
2. ----- is an arithmetic Instruction.
(a) Mov d,s (b) CMP a,b (c) IN a,DX (d) POP
3. In a metal semiconductor junction the width of the depletion region will be essentially
(a) same as that in semiconductor region
(b) same as that in metallic region
(c) same as that of a p-n junction
(d) none of these
4. The 16 bit flag of 8086 microprocessor is responsible to indicate _____
(a) the condition of result of ALU operation
(b) the condition of memory
(c) the result of addition
(d) the result of subtraction
5. Name the register in 8051 microcontroller that does not have an internal address.
(a) DPTR (b) PC (c) SP (d) TMOD

5 x 1 (5)

Section B

Answer any 7 (2 marks each)

6. What are the interrupts of 8085?
7. Write note on Flash Disc.
8. Write note on virtual memory and cache memory.
9. What is a Schottky diode?
10. Give the energy band diagram of a non rectifying metal-n semiconductor junction with positive voltage applied to metal.

11. How may we measure the barrier potential of a Schottky diode?
12. What is the need for segmentation?
13. Compare 8085 and 8086.
14. Differentiate between a microprocessor and a microcontroller.
15. Explain how data is stored/retrieved to/from stack.

7 x 2 (14)

Section C

Answer any 4 (5 marks each)

16. Explain memory decoding using PAL.
17. The reverse saturation currents of a pn junction and Schottky diode are 10^{-14} A and 10^{-9} A respectively. Determine the voltages needed to obtain a current of 100 micro amperes in both diodes.
18. Calculate the theoretical barrier height, built in potential barrier and maximum electric field in a tungsten to n-type silicon Schottky diode at $T=300$ K and doping concentration of $N_d = 3 \times 10^{16}/\text{cm}^3$ ($\phi_m = 4.55$ V, $X = 4.01$ V, $N_c = 2.8 \times 10^{19} /\text{cm}^3$).
19. Discuss the different instruction format of 8086.
20. Give the significance of 'O' flag, 'T'flag, 'I' flag & 'D'flag of 8086.
21. The number A6h is placed somewhere in the external RAM. Find the address of that location and put that address in R6 (LSB) and R7 (MSB).

4 x 5 (20)

Section D

Answer any 3 (12 marks each)

22. Discuss in detail the memory management concepts in microcomputer system.
23. Explain the addressing modes in detail citing examples in 8085.
24. Bring out the contrast between a pn junction and a Schottky junction.
25. Discuss the energy band gap of (semiconductor:semiconductor and metal:semiconductor) heterojunction materials.
26. The organization of 8086 using a block diagram.
27. Discuss how we can use 8051 microcontroller for keyboard and display applications.

3 x 12 (36)