D 13196 (Pages : 2) Name.....

Reg. No.....

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, DECEMBER 2016

(CUCSS)

Physics

PHY 1C 04—ELECTRONICS

(2012 Admissions)

Time : Three Hours Maximum : 36 Weightage

Section A

Answer **all** *questions.*
Each question carries a weightage of 1.

1. What is drain conductance ? Give the relation between drain conductance and drain current.
2. Why are the MOSFET circuits slower than the corresponding bipolar circuits ?
3. Draw the Schematic diagram of a simplified pn junction photodiode.
4. What is the basic principle of working of LDR ? Mention its application.
5. What are the advantages of integrators over differentiators in practical applications ?
6. Which are the externally initiated interrupt signals of 8085 microprocessor ? Write its priority order.
7. The FF is essentially a 1-bit memory or storage unit. Why ?
8. What is propagation delay time ? How it is related with the solution of racing problem in flip-flops ?
9. How does the voltage follower prevent the loading effect in a circuit ?
10. JMP 3000H and JM 4000H are branch group of instructions. What is the difference between the two ?
11. Compare CMOS with TTL.
12. Explain the instructions of 8085 microprocessor :
    (a) LXI B 6000H.
    (b) LDA 6500H.

(12 × 1 = 12 weightage)

Turn over

Section B

Answer any **two** *questions.*
Each question carries a weightage of 6.

13. Sketch the circuit of a common source amplifier : Derive the expression for the voltage gain at low frequencies. What is the maximum value of A_v ? Compare the common source stage with the common drain configuration.
14. With the help of Schematic diagram of a typical solar cell, explain its working principle.
15. Draw a Schmitt trigger circuit and explain how a square wave generator in this circuit. What is the advantage of Schmitt trigger over zero crossing detectors?
16. Explain the working of a 3-bit ripple counter using JK FF. Also draw its timing diagram?

(2 × 6 = 12 weightage)

Section C

Answer any **four** *questions.*
Each question carries a weightage of 3.

17. Keeping the gate-voltage constant, the drain to source voltage of a FET is changed from 15 V to 5 V. The drain current then changes by 100μmA. Calculate the drain resistance of the FET.
18. The band gap of GaAs LED at 300k is 1.42 eV, which changes (decreases) with temperature as $\frac{dE_g}{dT} = -4.4 \times 10^{-4}$ eV/K. What is the change in the emitted wavelength, if the temperature change is 10°C ?
19. A schimit trigger is found to switch on due to the application of 2.65 V as the input, but it is formed to switch of only at 1.9 V :
    (a) What is the hysteresis voltage of the schimit trigger ?
    (b) What is the minimum amplitude of the input signal that will produce an output ?
20. Design a low-pass filter for a cut-off frequency of 2 kHz and pass band gain 2.
21. Explain the working of an opamp as scale changer.
22. Write an assembly language programme for adding the contents of memory location 8000H and 8050H. Store the result in 8100 H.

(4 × 3 = 12 weightage)