C 32343 (Pages : 2) Name.....

Reg. No.....

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, DECEMBER 2017

(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 resistance ? Give the relation between drain resistance and drain current.
2. Draw the volt-ampere drain characteristics of a P-channel E-MOSFET.
3. What is the basic principle of the working of LDR ? Mention its application:-
4. Write the relation between light intensity in a semiconductor and absorption coefficient. What is its significance ?
5. What are the characteristics of an ideal op amp ?
6. What is the slew rate of an op amp ? Write the relation between maximum frequency of the signal voltage and slew rate.
7. Why Schmitt trigger is preferred to zero crossing detector ?
8. Explain the functions of ALE and IO/$\overline{m}$ signals of the 8085 microprocessor.
9. Write the description of the following instructions : INR C, JM 3000H, JMP 2085H, OUT 01H.
10. Compare C MOS with TTL.
11. The FF is essentially a 1-bit memory. Why ?
12. In analogue computers, integrators are preferred to differentiators. Why ?

(12 × 1 = 12 weightage)

Turn over

Section B

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

13. Explain the working of MOSFET under depletion mode. Also explain the working of enhancement type MOSFET

14. What is a tunnel diode ? Explain the principle of working of a tunnel diode, giving its characteristics.

15. Explain how a square wave is generated in an op amp based square wave generator.

16. What is a ripple counter ? Why is it called so ? How many FF s would be needed to count the number 7 ? Explain its working.

(2 × 6 = 12 weightage)

Section C

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

17. When V_{GS} of a FET changes from –3.1 V to 3 V, the drain current changes from 1mA to 1.3mA ? Find the value of transconductance.

18. A photodiode has a quantum efficiency of 65% when photons of energy 1.5×10^{-19} J are incident upon it. At what wavelength is the photodiode operating ?

19. What is the error in the differential output, if the inputs V_1 = 1050 μV, V2 = 950μ Vand CMRR = 1000 ?

20. Design a high pass filter for a cut-off frequency of 2 kHz and pass band gain 2.

21. The inverting and non-inverting terminals of an opamp are grounded. If the op amp has an input offset voltage of 5mV and an open loop voltage gain of 10,000, then what will be the output voltage ?

22. Write an assembly language programme for adding the contents of the memory location 8000H and 8050H. Store the result in 8100H.

(4 × 3 = 12 weightage)