SG-185

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B.Sc. (Part - III) (Semester - V) (CBCS) Examination, January-2023
PHYSICS (Paper-XII)
DSE-E4 : Digital and Analog Circuits and Instrumentation
Subject Code: 79680

Day and Date : Friday, 06 - 01 - 2023 **Total Marks : 40**

Time : 2.30 p.m. to 4.30 p.m.

Instructions :
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Neat diagrams must be drawn whenever necessary.**
4) **Use of calculators/logarithmic tables are allowed.**

Q1) Select correct alternative. **[8]**

a) _____is a logic circuit that adds two binary digit at a time.

i) full adder ii) half adder

iii) flip flop iv) gates

b) For_____gate output is high when all its inputs are low.

i) NOR ii) NAND

iii) XOR iv) AND

c) In digital circuit_____represents a binary low level.

i) binary one ii) binary zero

iii) binary two iv) binary infinite

d) The current amplification factor in a common emitter configuration is the ratio of_____

i) $\Delta I_E / \Delta I_B$ ii) $\Delta I_B / \Delta I_E$

iii) $\Delta I_C / \Delta I_B$ iv) $\Delta I_C / \Delta I_E$

e) Astable multivibrator has_____stable states.

i) two ii) three

iii) one iv) zero

P.T.O.

f) In CE transistor amplifier circuit input is applied to_____terminal of the transistor.

i) base ii) emitter

iii) collector iv) none of these

g) The arrangement of electrodes which produce a focused beam of electrons is called _____.

i) electron tube ii) electron gun

iii) electric tube iv) soldering gun

h) The CRO is used to measure_____

i) voltage ii) frequency

iii) phase iv) all of above

Q2) Attempt any Two of the following. **[16]**

a) Explain NAND, NOR, Ex-OR and EX-NOR gate with its logic diagram.

b) Draw the neat block diagram of CRO and explain the function of each block.

c) Draw circuit diagram of astable multivibrator and explain its working. Find the frequency and duty cycle of this multivibrator.

Q3) Write short notes on any four of the following. **[16]**

a) Explain NAND as a universal gate.

b) Write a note on half adder.

c) Write a note on crystal oscillator.

d) Write a note on Lissajous figures with examples.

e) State Characteristics of an ideal op-amp.

f) Gives advantages and disadvantages of CE amplifier.