लक्ष्यं विश्वमानम्

WEST BENGAL STATE UNIVERSITY

B.Sc. Honours Part-II Examination, 2020

ELECTRONICS

PAPER: ELTA-IV

Time Allotted: 2 Hours | Full Marks: 50

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

SECTION-A

1. Answer any ***five*** questions from the following: 2×5 = 10

(a) What do you mean by space-charge in a p-n junction?

(b) What is the origin of the reverse saturation current in a p-n junction?

(c) Why crystal oscillator has very high frequency stability?

(d) State the effects of negative feedback in an amplifier.

(e) How is virtual ground different from an actual ground?

(f) What is the function of aquadag in a CRO?

(g) Define α and β in connection with a transistor.

(h) State Barkhausen Criterion.

SECTION-B

20×2 = 40

Answer any *two* questions from the following

2. (a) When is a p-n junction said to be (i) forward-biased, (ii) reverse-biased? If the biasing voltage is the same, will the same current flow under both forward and reverse bias conditions? Justify your answer. 2+3

(b) Define the static resistance and dynamic resistance of p-n junction. Do these resistances depend on temperature and bias voltage? 3+2

(c) Discuss how a transistor can be used as a current amplifier? 5

(d) The emitter current of 20 mA flows through a transistor of β=200. Calculate the base current and the collector current of the transistor. 5

3. (a) How is a transistor represented as a two port device? 2

(b) Find the hybrid parameters of a small signal low frequency transistor amplifier operating in CE mode. 8

(c) Write notes on any ***two*** of the following: 5+5
   (i) Common Mode Rejection Ratio (CMRR)
   (ii) Astablemultivibrator
   (iii) Instrumentation Amplifier

4. (a) Draw the circuit diagram of a full-wave rectifier and explain its working principle. Find out the ripple factor and conversion efficiency of this rectifier. 2+2+3+3

(b) State reasons for shift of Q point of a transistor. 3

(c) What is meant by harmonic distortion in an amplifier? Show with relevant circuit diagram how a push-pull configuration eliminates even harmonics. 2+5

5. (a) Write short notes on any ***two*** of the following: 5+5
   (i) Delay Line
   (ii) Horizontal deflection system
   (iii) Electrostatic focusing system

(b) Explain with necessary circuit diagram operation of a current mirror. 4

(c) Explain operations of a Schmitt trigger using OPAMP and find expression for Hysteresis Voltage. 6

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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