2022

COMPUTER SCIENCE — HONOURS

Paper : CC-4

(Basic Electronic Devices and Circuits)

Full Marks : 50

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer **question no. 1** and **any four** from the rest.

1. Answer **any five** questions :   2×5

   (a) What is the cut in voltage in PN junction diode?

   (b) What is Zener breakdown?

   (c) Explain the function of the depletion region of PN junction diode.

   (d) What is LED? How is it different from PN junction diode?

   (e) What is CMRR of an OPAMP?

   (f) What is forward break over voltage in SCR?

   (g) Which function is performed by R-2R ladder?

   (h) What are the differences between JFET and BJT?

2. (a) Draw the transfer characteristics of a transistor acting as a NOT Gate. Explain how the transistor function as a switch specifying the threshold voltage from the transfer characteristics.

   (b) What is self-bias?   8+2

3. (a) Draw the circuit diagram of a P-N-P transistor in C-E configuration. Explain its function.

   (b) Explain how a transistor works as a linear amplifier.   6+4

4. (a) Draw the circuit diagram of a forward biased p-n junction diode. Draw the characteristic curve and explain its nature.

   (b) How a Zener diode is used as a voltage regulator? Draw suitable circuit.   6+4

5. (a) Compare among (i) half-wave, (ii) full-wave and (iii) bridge rectifier.

   (b) What is ripple factor?   8+2

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6. (a) Describe the use of an OPAMP as an amplifier.

   (b) What is voltage gain of an OPAMP?

   (c) Describe the use of an OPAMP as adder.   3+2+5

7. (a) Distinguish between astable and monostable multivibrator.

   (b) What is the effect of RC product on the output wave of multivibrator?   8+2

8. (a) Draw the circuit diagram of a CMOS NOT Gate and briefly explain its operation.

   (b) Explain the Successive Approximation Register (SAR) type ADC.   5+5