This question paper contains 3 printed pages]

Roll No. | | | | | | | | | | | |

S. No. of Question Paper : 1532-Ξ

Unique Paper Code : 1143703 Ξ-7

Name of the Paper : Basic Electronics

Name of the Course : B.Tech. Polymer Science—Allied Course

Semester : VII

Duration : 3 Hours Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt *Five* questions in all.

Non-programmable Scientific calculator is allowed.

Question No. 1 is compulsory.

All questions carry equal marks.

1. (*a*) Explain the mechanism of formation of space charge region in a p-n junction. 3

(*b*) Draw and explain the I-V characteristics of SCR. 3

(*c*) Define pinch-off voltage and transconductance of JFET. 3

(*d*) Convert the binary number $(1001.00102)_2$ to decimal. 3

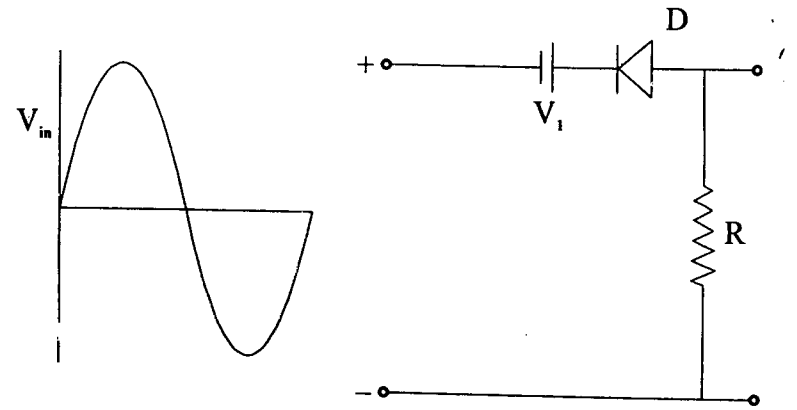
(*e*) Write the truth table for R-S flip-flop and J-K flip-flop. 3

2. (*a*) Explain the working of full wave rectifier. How a parallel C-filter can improve the output of a full wave rectifier ? 8

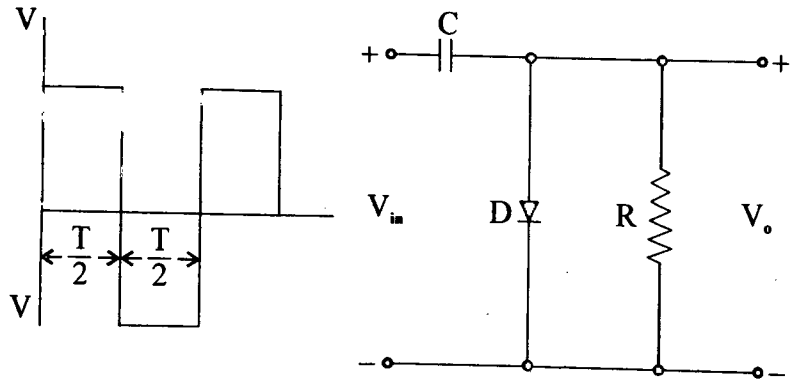
P.T.O.

(*b*) Draw the output waveforms of the following circuits : 5

(*i*)



(*ii*)



(*c*) Draw and explain the I-V characteristics of Zener diode. 2

3. (*a*) Draw and explain the input and output characteristics of a npn transistor in common emitter configuration. 7

(*b*) Define α and β for a transistor and drive the relation between them. 4

(*c*) Draw the equivalent circuit of UJT and explain its emitter characteristics. 4

4. (*a*) Draw and explain the transfer and drain characteristics of JFET. 6

(*b*) Explain the working of enhancement type MOSFET. 5

(*c*) Compare properties of BJT and FET. 4

5. (*a*) Explain a technique which converts an analog signal to a digital signal. 7

(*b*) Give the truth table of Half-Adder and sketch a circuit which may be used to realize the Half-Adder. 5

(*c*) What is the significance of multiplexing ? Draw and explain the circuit of a 4 × 1 multiplexer. 3

6. (*a*) Describe the working of light emitting diode (LED). 6

(*b*) Explain the significance of Amplification in Electronics. 5

(*c*) What do you mean by universal gates ? Implement AND, OR and NOT gate using a universal gate. 4

7. Write short notes on :

(*a*) FAN-IN, FAN-OUT and NOISE MARGIN. 5

(*b*) Zener diode voltage regulator 5

(*c*) Complimentary MOS (CMOS). 5