Printed Pages : 4

NAG-301/AG-301

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 992301/993301

Roll No.

B. Tech.

(SEM. III) (ODD SEM.) THEORY EXAMINATION, 2014-15

BASIC ELECTRONICS AND INSTRUMENTATION

Time : **3** Hours]   [Total Marks : **100**

Note : Attempt question from all sections as per instruction.

SECTION - A

1   Attempt all part of the questions. All parts   **10×2=20**
carry equal marks :

(a)   Define the zenar and avalanche breakdown in p-n junction.

(b)   What the meant by depletion layer in p-n junction?

(c)   What is the effect of temperature on conductivity of a semiconductor?

(d)   What are called universal gates? Why are they called so?

(e)   Does a hole in a semiconductor contribute to a flow of current? If yes, how and if no, how?

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(f) What the need for biasing a transistor?

(g) Define positive logic and negative logic in logic design.

(f) State the advantage of a digital instrumentations over a analog instruments.

(h) Explain, why BJT are called bipolar devices and FET are called unipolar device?

(i) What is the duality in Boolean algebra?

SECTION -B

2 Attempt any three questions. All question 10×3=30 carry equal marks :

(a) Explain the potential divider biasing circuit.

(b) Draw the circuit diagram of transistor in CE configuration and sketch in output characteristics.

(c) What are the advantage of the FET over a BJT ? Define pinch off voltage and drain voltage and drain resistance FET.

(d) Explain the construction and characteristics of JFET.

(e) Draw and explain V-I characteristics of P-N junction diode.

SECTION - C

3 (a) Write the characteristics of an ideal   **10×1=10**
op-amp. How it is used as an integrator and
summer?

OR

  (b) Explain the basic construction, operation and
characteristics of MOSFET.

4 (a) Explain the working of positive clipper **10×1=10**
and negative clamper circuit.

OR

  (b) Explain the working of Hall wave and Full wave
rectifier. What are the advantage of full wave rectifier?

5 (a) Explain how frequency and phase can   **10×1=10**
be measure using a CRO. And also describe
the application of CRO.

OR

  (b) Draw and explain input/output characteristics of
CB configuration of BJT.

6 (a) What do you understand by don+ care   **10×1=10**
condition is it an advantage or disadvantage
to include then in a map, explain with reasons?

OR

  (b) Simplify the function using k-map
$F(A,B,C,B) = \pounds m(3,4,5,7,9,13,14,15)+\pounds d(0,1,8,10)$.
Implement the output using gates.

7   (a)   Draw the block diagram of digital   **10×1=10**
            multimeter. Explain the operation of each block.

OR

    (b)   Draw the circuit of op-amp as a subtractor and
            find out the expression of output.

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