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Total Number of Pages : 02

B.TECH

AR-17

B.TECH 1ST SEMESTER EXAMINATIONS(BACK), NOV/DEC 2019

BBSES1041- BASICS OF ELECTRONICS

Time: 3 Hours

Max Marks : 100

The figures in the right hand margin indicate marks.

PART-A

(10X1 = 10 MARKS)

Answer all questions.

- In a pnp transistor, the current carriers are
- In a transistor, $I_C = 100 \text{ mA}$ and $I_E = 100.2 \text{ mA}$. The value of β is
- DC average current of a half wave rectifier output is
- In a transistor if $\beta = 100$ and collector current is 10 mA , then I_E is
- A semiconductor has temperature coefficient of resistance.
- When a penta-valent impurity is added to a pure semiconductor, it becomes
- The Minimum number of NOR gates required to design XNOR IS
- 2's complement of -39 is
- For converting analog signal to Digital signals device used is called
- If even number of 1 is there in input, the XOR gate has a output value of

PART-B

(15 x 2 = 30 MARKS)

Answer any fifteen questions from the following.

- PN Junction diode made up of which material (Si, Ge, GaAs) will have highest thermal stability ? Why?
- Find the frequencies f & ω of a sin wave signal with a period of 1 ms .
- Why BJT is called so current controlled device ?
- Define positive logic and negative logic.
- Why the time base in a CRO is of saw-tooth type ?
- Derive the equation $I_C = \beta I_B + (1 + \beta) I_{CO}$
- What is the decimal equivalent of hexadecimal number $(BAD)_{16}$?
- Find the percentage increase in thereverse saturation current of a diode if the temperature is increased from 25°C to 50°C .
- Use NAND gates only to implement the expression $X = A' + BC$.
- In an half wave rectifier, the input sine wave is $200\sin 200 \pi t$. If load resistance is of 1 k then find the average DC power output .
- Give two reasons of using modulation.
- what is zener breakdown ? Draw its VI characteristics.
- What are the merits & demerits of amplitude modulation over frequency modulation?
- A Lissajous pattern on a CRO has 5horizontal tangencies & 2 vertical tangencies.The frequency of horizontal input is 1 KHz .What is the frequency of vertical input?
- What is the Shockley's equation when $V_{GS} = -1 \text{ v}$ and $V_p = -4 \text{ v}$ with $I_{DSS} = 8 \text{ mA}$
- Convert $(ABCD)_{16} = (\dots)_8$
- How to measure the frequency in Lissajous Pattern?



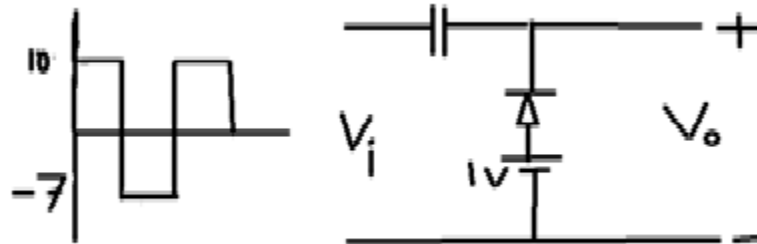
18. Convert $(A'+B+C)(C+D)$ into canonical SOP.
19. Implement $(AB+C)$ using only NOR gate.
20. Convert $\sum (1,3, 5, 6, 7)$ in to canonical POS.

PART-C

(6 x 5 = 30 MARKS)

Section-iAnswer any Six questions

1. Explain the basic block diagram of communication System .
2. Explain the working principle of CRT with neat diagram .
3. Calculate the value of output voltage for the given circuit and draw the output wave form?



4. state De-Morgan's theorem and apply to the following expression :
 a. $Y = \overline{AB} + \overline{CD} + EF$
5. Derive an expression for I_{dc} & I_{rms} for half-wave rectifier & find its maximum efficiency.
6. Describe the principle of operation of enhancement type MOSFET with suitable diagrams.
7. Explain the half adder with neat diagram.
8. Explain the block diagram of CRO.

Section-iiAnswer any Two questions

(2 x 15 = 30 MARKS)

- 1) Distinguish between a half-adder & Full adder. Explain full adder with the help of its truth table.
- 2) A crystal diode having an internal resistance $r_f = 20\Omega$ is used for half wave rectification .If the applied voltage is $v = 50\sin\omega t$ and the load resistance $R_L = 800\Omega$. Determine the following :
 i) I_m, I_{dc}, I_{rms}
 ii) AC power input & DC power output
 iii) Ripple Factor
 iv) DC output voltage
 v) PIV
- 3) Explain the functional block diagram of AF sine & square wave generator.
- 4) (a) Explain the full Adder with neat sketch.

(b) Implement Full Adder using minimum no of Nand Gate.