S.No. : 148 BEC 3101/3201

No. of Printed Pages : 06

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

PAPER ID : 33401 Roll No. | | | | | | | | | | |

B. Tech. Examination 2021-22

(Special Carry Over Paper)

BASIC ELECTRONICS ENGINEERING

Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION–A

1. Attempt all questions. All questions carry equal marks. 8×1=8

   (a) Which type of impurity is added to make p type semiconductor.

   (b) Draw the VI characteristics of ideal diode.

   (c) Draw energy band diagram of conductor.

   (d) For $\beta = 100$ find the value of α.

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(e) What is the full form of MOSFET?

(f) What is the 1's complement of $(1011)_2$?

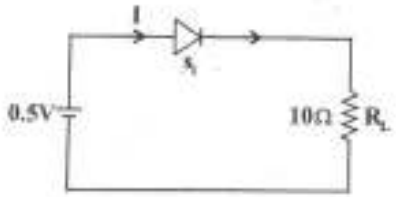
(g) Draw the circuit diagram of voltage follower.

(h) Write down the truth table of X-NOR gate.

SECTION – B

Note :– Attempt any two questions. Each question carry equal marks. 6×2=12

2. (a) Explain working of PN junction diode in forward biased condition. Calculate the current I for the network given below : 6



(b) Explain the construction and working of pnp transistor. 6

(c) Perform the following conversion :

(i) $(4BD)_{16}$ into binary

(ii) $(234)_8$ to binary 6

(iii) $(475.25)_8$ to decimal

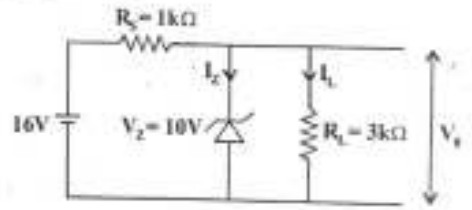
(iv) $(47.39)_{10}$ to octal 6

(d) Draw the circuit diagram of non-inverting amplifier. Derive the expression of voltage gain for inverting amplifier. 6

SECTION – C

Note :– Attempt any two parts from each question. All questions carry equal marks. 8×5=40

3. (a) Compare Zener breakdown and Avalanche breakdown. For the network given below find I_L, I_Z and V_0 :



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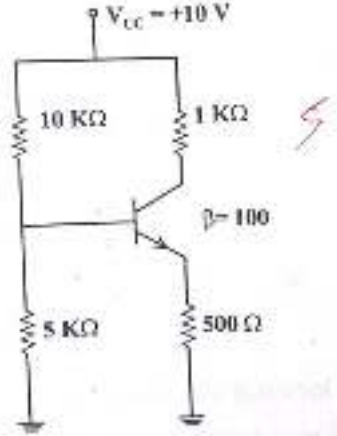
(b) Draw neat diagram of bridge full wave rectifier. For the centre-tapped rectifier, the voltage across half of the secondary winding is $V_s = 200 \sin wt$. Assume $R_L = 10\ K\Omega$. Find 5

I_{dc}, I_{rms}, PIV, ripple factor, P_{dc}, P_{ac}, rectification efficiency.

(c) Explain the working of LED with neat diagram. What are the advantages of LED?

4. (a) Sketch and explain the characteristics of JFET.

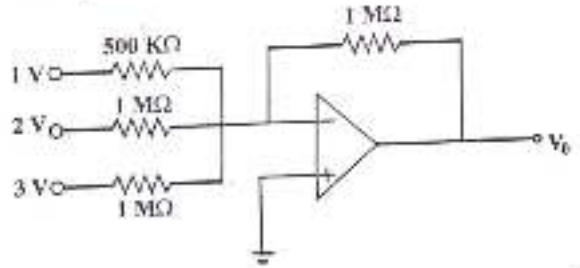
(b) For the following voltage divider circuit find the I_C and V_{CE}. Assume silicon transistor :



(c) What is the need for modulation in communication system? Also draw the block diagram of communication system.

5. (a) What do you understand by CMRR? Also determine the output voltage of an op am for the input voltages of 300 micro volt and 240 micro volt. The differential gain of the amplifier is 5000 and the value of CMRR is 10^5.

(b) Enlist the characteristics of ideal OP amp. Find the output voltage for the following network :



(c) What do you mean by differentiator and integrator? Also derive the output expression for integrator and differentiator.

6. (a) Define minterms and maxterms. Express the following Boolean function in sum of minterms (canonical SOP)

$$F(ABCD) = ABC' + ABD + BCD'$$

and also reduce the function using K-map.

(b) What do you mean by universal gates? Realize OR gate using NAND gates only and AND gates using NOR gate only. 5

(c) Perform the following subtraction :

(i) $(32)_{10} - (24)_{10}$ using 1's complement method

(ii) $(32)_{10} - (24)_{10}$ using 2's complement method 5

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