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University Roll No. ~~30000~~

Summer Term Carry Over Examination 2018-19

B.Tech. 1st Year

Subject Name: Electronics Engineering

Subject Code: BECG 0001/ ECE 1001

Time: 03 Hours.

Max. Marks: 80

Section – A

Note : Attempt All Questions.

2 x 10 = 20 marks

- (I) Write the name of two trivalent impurities.**
- (II) What do you mean by peak inverse voltage?**
- (III) Write the basic two differences between Zener breakdown and Avalanche breakdown.**
- (IV) In which region transistor act as a switch?**
- (V) Draw the block diagram of regulated power supply.**
- (VI) List the types of biasing of BJT.**
- (VII) FET is voltage controlled device, Justify.**
- (VIII) What is the significance of slew rate in Operational Amplifier?**
- (IX) Mention De-Morgan's laws.**
- (X) Subtract the $(1011)_2$ from $(1100)_2$ using direct method.**

Section – B

Note: Attem Any Two Parts of Each Questions.

5 x 2 x 3 = 30 marks

- (I)(A) Define diffusion capacitance and transition capacitance of a p-n junction diode.**

(B) Explain the working of a full wave bridge rectifier with neat circuit diagram.

(C) Determine the range of values of V_i that will maintain the Zener diode of Fig. (1) in the "on" state.

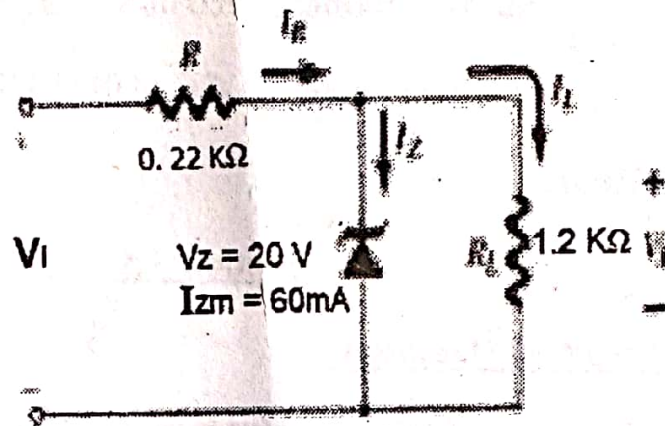


Fig. (1)

(II) (A) Differentiate the CB, CE, CC configuration in terms Current gain, Voltage gain, Input Impedance and output Impedance.

(B) Calculate the values of I_C , V_{CE} , V_C , V_E and V_B for the circuit shown in Fig. (2). Take $\beta = 50$.

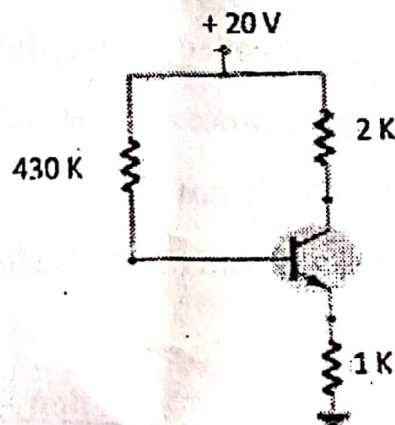


Fig. (2)

(C) Explain the operation of N-Channel JFET with suitable neat diagram.

(III)(A) Implement the NOT, AND, OR gates using minimum number of NAND gates only.

(B) Simplify the following function using K- Map. Implement the simplified function using Basic Gates only.

$$F = \sum m(0,1,2,4,7,9,11,14,15) + d(3,10,12)$$

(C) Find the Min-Terms and Max-Terms for the following function

$$F = AB + ABC + ABD$$

Section – C

Note : Attempt All Questions.

10 x 3 = 30 marks

(I) (A) Analyze and draw the output waveform of the following circuit shown in Fig. (3) Where $V_m = 5V$ and $V = 2V$. (5 marks)

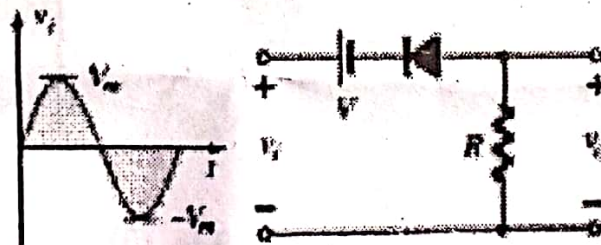


Fig. (3)

OR

Analyze and draw the output waveform of the following circuit shown in Fig. (4). Assume the diode is ideal.

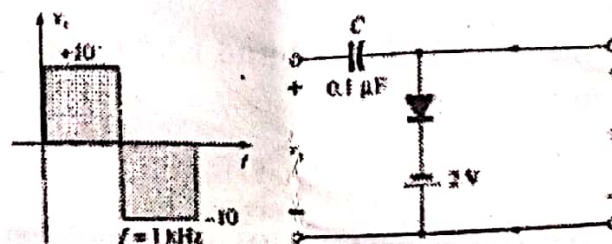


Fig. (4)

(B) Draw V-I characteristics of PN junction Diode and write Diode current Equation. (5 marks)

(II) (A) Determine the V_{GS} , I_D , V_{DS} , V_S , V_G for the circuit shown in Fig. (5) ($I_{DSS} = 10\text{mA}$, $V_p = -8\text{V}$) (5 marks)

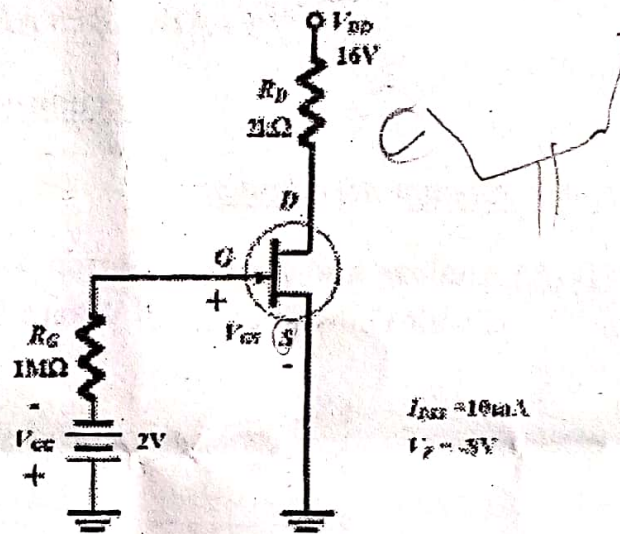


Fig. (5)

OR

Derive the stability factor for fixed bias of BJT with neat circuit diagram.

(B) Draw the input and output characteristics of common emitter configuration. (5 marks)

(III) (A) Implement the EXOR and EXNOR gates using NAND Gates only. (5 marks)

OR

Derive the expression for Operational Amplifier as Integrator with suitable circuit diagram. Explain virtual ground condition.

(B) Solve $(EBC.12)_{16} + (746.15)_8 = (?)_2$ (5 marks)