[No. of Printed Pages – 4]

ES201 Enrol. No. A2305220433

[ET]

END SEMESTER EXAMINATION : NOV.–DEC., 2021

BASIC ELECTRONICS ENGINEERING

Time : 3 Hrs. *Maximum Marks : 60*

Note: ***Attempt questions from all sections as directed. Use of Scientific Calculator is allowed.***

SECTION – A (24 Marks)

Attempt any **four** *questions out of* **five**.
Each question carries **06** *marks.*

1. What is the difference between Avalanche break down and Zener breakdown? Explain with a circuit diagram how the Zener diode maintains a constant voltage across the load?

2. A P-N diode having forward resistance $R_f = 20\Omega$ is used for half-wave rectification. If the applied input voltage $V = 50 \sin \omega t$ and load resistance $R_L = 800\Omega$, Find the following specifications for half-wave rectifier:

   (i) I_{max}, $I_{d.c.}$ and I_{rms}

P.T.O.

(ii) $V_{d.c.}$

(iii) $P_{a.c}$ and $P_{d.c.}$

3. How to input voltage controls the output current in a JFET. When does the JFET act as a voltage variable resistance? Sketch and level the ohmic region in drain characteristics of JFET?

4. Draw the basic circuit of a differential amplifier. The differential mode gain of an amplifier is 66 dBand CMRR is 40 dB Calculate the output voltage if the inputs are lmV and 0.9 m V.

5.

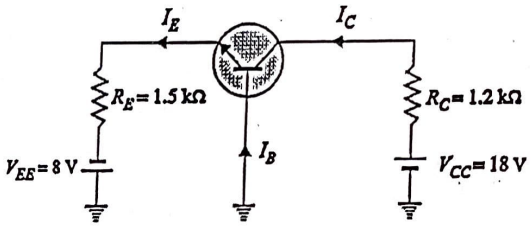
Inputs			Output
A	B	C	X
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	0

From the given truth table, determine the standard SOP expression?

SECTION – B (20 Marks)

Attempt any **two** *questions out of* **three.**
Each question carries **10** *marks.*

6. For the common base circuit shown in the following figure, Determine current I_C and voltage V_{CB}. Assume the transistor to be of silicon.



7. (a) Why NAND and NOR gates are termed Universal gates? Explain with two proper examples. (5)

(b) Why a Schottky diode is called a hot-carrier diode, Explain? Sketch the curve for the comparison of V-I characteristics of Schottky diode with P-N junction diode. (5)

8. (a) What is the significance difference between the construction of an Enhancement – type MOSFET and Depletion - type MOSFET. Draw the structure of N- channel depletion type MOSFET. (6)

P.T.O.

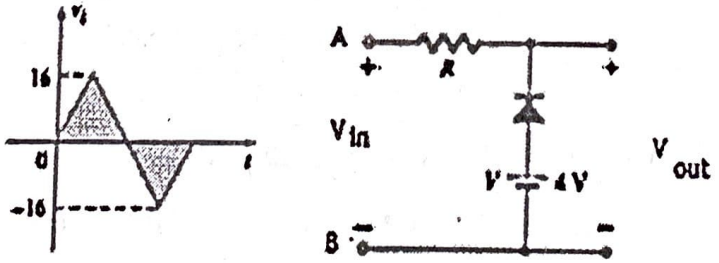
(b) In a JFET circuit the I_{DSS} = 9 mA and the *pinch off voltage* Vp = –3.5 V Determine drain current I_D when V_{GS} = 0V and V_{GS} = –2 V. (4)

SECTION – C (16 Marks)

(Compulsory)

9. (a) Draw the circuit diagram of an Inverting amplifier using OP-AMP and derive the expression for its voltage gain. Locate the virtual ground point in the circuit, what is the significance of virtual ground? (8)

(b) Determine and sketch Vout for the following network if input wave is applied at the input terminal A-B of the network



(4)

(c) Why do we need biasing for any transistors? Discuss and sketch the emitter bias circuit, write its advantage over the fixed bias circuit. (4)