

Hi-Tech Institute of Engineering & Technology	
DEPARTMENT OF APPLIED SCIENCE	
1 ST MODEL PAPER, ODD SEMESTER-2023-24,	
Semester: 1st	Course/Branch: B.Tech
Subject Code: BEC 101	Subject Name: FUNDAMENTALS OF ELECTRONICS ENGINEERING
Faculty Name: Ms. Jyoshita	
Time: 3: 00 Hours	Total Marks: 70

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. Attempt all questions in brief. 2X7=14

Q No.	Question	Marks	CO
a.	Define transconductance of JFET.	2	2
b.	Differentiate between avalanche and zener breakdown.	2	1
c.	What is RADAR ? Write down two applications of RADAR..	2	1
d.	Find 1's and 2's complement of ; 10001100.	2	2
e.	List two advantages of modulation.	2	2
f.	State two differences between FET and BJT.	2	1
g.	Define CMRR.	2	2

SECTION B

2. Attempt any three of the following: 7X3= 21

Q No.	Question	Marks	CO
a.	Write down the characteristics of ideal op-amp . Derive the expression for gain of op-amp as non inverting amplifier.	7	3
b.	Describe AM modulation and De-modulation technique with suitable diagram.	7	4
c.	Draw and explain common base N-P-N Transistor with its input and output characteristics graph. Also write the expression for output current.	7	4
d.	State and Derive De – Morgan's law.	7	3
e.	What is the difference between clipper and clamper. Explain with the help of suitable diagram.	7	4

SECTION C

3. Attempt any one part of the following: 7X1= 7

Q No.	Question	Marks	CO
a.	With the help of neat circuit diagram, explain the working of a full wave bridge rectifier.	7	3
b.	Derive the relationship between current amplification factor for common emitter and common base configuration of a bipolar junction transistor.	7	4

4. Attempt any one part of the following:**7X1= 7**

Q No.	Question	Marks	CO
a.	Explain the working of enhancement type MOSFET along with their transfer characteristics.	7	3
b.	Describe the construction and working of P- channel Depletion MOSFET with characteristics graph. Also justify that it is a voltage controlled device.	7	4

5. Attempt any one part of the following:**7X1= 7**

Q No.	Question	Marks	CO
a.	What is an operational amplifier ? Draw its block diagram. Write the characteristics of an ideal op-pam.	7	5
b.	What do you mean by IOT? Discuss its various components.	7	4

6. Attempt any one part of the following:**7X1= 7**

Q No.	Question	Marks	CO
a.	Simplify the following Boolean expression : $F(A,B,C,D,E) = \sum (2,4,6,8,5,7,9) + d(6,11,13,16,18, 23, 25, 29)$	7	4
b.	Define universal logic gates. Why NAND and NOR gates are called as universal gates?	7	5

7. Attempt any one part of the following:**7X1= 7**

Q No.	Question	Marks	CO
a.	Why do we need modulation? The antenna current of an AM transmitter is 8 A when only the carrier is sent, but it increases to 8.93 A , when the carrier is modulated by a single sine wave. Find percentage modulation. Determine the antenna current when the percentage modulation changes to 0.8.	7	4
b.	What do you mean by satellite communication? Enlist its advantages..	7	5