Q. Code: 163798

Reg. No. | | | | | | | | | | | | | |

M.E./ M.TECH. DEGREE EXAMINATIONS, MAY 2023

First Semester

MS18101 – CONCEPTS IN ELECTRONICS ENGINEERING

(Mechatronics)

(Regulation 2018A)

TIME: 3 HOURS **MAX. MARKS: 100**

CO 1 To understand the basics and working principles of electronic components and their applications.

CO 2 To understand the concepts, working principles and key applications of linear integrated circuits.

CO 3 To develop a digital logic and apply it to solve real life problem.

CO 4 To provide a brief knowledge of measurements and measuring instruments related to Electronics Engineering.

CO 5 To provide basic knowledge about the various sensors, actuators and controllers that are useful in Power Management.

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Distinguish between intrinsic and extrinsic semiconductors.	**1**	**4**
2.	Distinguish between avalanche breakdown and Zener breakdown.	**1**	**4**
3.	Design an inverting amplifier with the gain as 2.	**2**	**3**
4.	List any 4 applications of operational amplifiers.	**2**	**2**
5.	Convert the given decimal number $(1100)_{10}$ to binary number and octal number.	**3**	**3**
6.	Simplify the given Boolean function – Y = A(A+B).	**3**	**3**
7.	What is a rectifier? List the various types of rectifiers.	**4**	**1**
8.	What is a data logger? List some of its applications.	**4**	**2**
9.	Compare pulse width modulation and pulse position modulation.	**5**	**4**
10.	What is an actuator?	**5**	**1**

PART- B (5 x 13 = 65 Marks)

		Marks	CO	RBT LEVEL
11.(a)	Illustrate the operation of a half wave rectifier using the V-I characteristics of a PN junction diode.	**(13)**	**1**	**3**

(OR)

(b)	Making use of the input and output characteristics of an NPN transistor in CE configuration, explain the operation as an amplifier.	**(13)**	**1**	**3**

12.(a)	Demonstrate, how an Op-Amp can be used as an Adder, an Integrator and a Differentiator.	**(13)**	**2**	**3**

(OR)

(b)	Illustrate the function of an operational amplifier as a square wave generator and obtain the relation for frequency of oscillation.	**(13)**	**2**	**3**

13.(a)	Draw a logic circuit that represents the simplified Boolean Function with minimum literals for the following min terms. $$F(w,x,y,z) = \sum(1,2,3,4,6,7,8,9,12,13,14)$$	**(13)**	**3**	**4**

(OR)

(b)	Implement the basic logics functions NOT, AND and OR, using only NAND gates and only NOR gates.	**(13)**	**3**	**4**

14.(a)	Explain in detail about the Regulated Power Supply.	**(13)**	**4**	**2**

(OR)

(b)	Explain in detail about the frequency Counters – Ripple Binary Coded Decimal Counter and Binary Synchronous Counter.	**(13)**	**4**	**2**

15.(a)	Illustrate the use of Pulse Width Modulation and Pulse Position Modulation in power management applications.	**(13)**	**5**	**3**

(OR)

(b)	Show the ways in which sensors and actuators are used in power management applications.	**(13)**	**5**	**3**

PART- C (1 x 15 = 15 Marks)

			Marks	CO	RBT LEVEL
16.	**(i)**	Design a non-inverting amplifier whose output is 10V for an input of 2V.	**(5)**	**2**	**5**
	(ii)	Design a 1 to 8 Demultiplexer using basic logic gates. What change has to be done to convert the demultiplexer into a 3 to 8 decoder?	**(10)**	**3**	**5**