B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2024

(Regulation 2018)

Fifth Semester

MECHATRONICS ENGINEERING

U18MCR0003: Mechatronics in 3D Printing

COURSE OUTCOMES

CO1: Understand the fundamentals of mechatronics and its importance in 3D Printing
CO2: Describe the operating principles of 3D Printing actuators and Controllers
CO3: Describe the mechanical components in 3D Printing
CO4: Explain the different sensors used in 3D Printing
CO5: Classify the communication protocols.

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions: -
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	What is a mechatronics system?	CO1	[K$_2$]
2.	Explain a closed loop system with an example.	CO1	[K$_2$]
3.	Explain the use of an actuator.	CO2	[K$_2$]
4.	List the types of actuators used in a 3D printer.	CO2	[K$_2$]
5.	Differentiate gear and pulley.	CO3	[K$_2$]
6.	What is the use of a coupling?	CO3	[K$_2$]
7.	List some of the sensor characteristics.	CO4	[K$_2$]
8.	What is a see beck effect?	CO4	[K$_2$]
9.	Explain ASCII	CO5	[K$_2$]
10.	What is a Baud rate?	CO5	[K$_2$]

Answer any FIVE Questions: -
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	List the various components of a mechatronics system.	08	CO1	[K$_2$]
	b)	In 3D printing, Explain Resolution, Accuracy and Repeatability	08	CO1	[K$_2$]
12.	a)	List the functions and types of HMI's used in a 3D printer.	16	CO2	[K$_2$]

| 13. | a) | With suitable illustration explain the nomenclature of a lead screw. | 16 | CO3 | [K₂] |

13. a) With suitable illustration explain the nomenclature of a lead screw. 16 CO3 [K$_2$]

14. a) What is an RTD? Discuss in detail. 16 CO4 [K$_2$]

15. a) List the key features, application, advantage and disadvantage of using RS 232. 08 CO5 [K$_2$]

    b) Discuss on the feature "Print from mobile" in 3D printers. 08 CO5 [K$_2$]

16. a) List and explain the types of gears used in a 3D printer. 16 CO3 [K$_2$]

****