KUMARAGURU
college of technology
character is life

Register Number:……

M.TECH DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Second Semester

MASTERS OF TECHNOLOGY MANAGEMENT

P18TME0037 : Rapid Prototyping Fundamentals

COURSE OUTCOMES

CO1: Develop 3D models for prototyping various product ideas.

CO2: Tools and Techniques to create prototypes in a quick iterative methodology.

CO3: Design the solution [MUP] concept based on the proposed value defined for the target customer exploring various alternate solutions to achieve value-price fit.

CO4: Develop skills in empathizing, critical thinking, analyzing, storytelling & pitching.

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

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Laser Stereolithography requires ____ CAD data in order to create solid models. CO1 [K_2]
   a) One dimensional b) Two dimensional
   c) Three dimensional d) Four dimensional
2. Which of the following is not an additive process? CO2 [K_2]
   a) SLS b) VMC
   c) Electron beam machining d) Fused deposition modeling
3. What is the commonly used gas in Laser engraver ? CO2 [K_2]
   a) Argon b) CO2
   c) Nitrogen d) Carbon
4. Which of the following is not a subtractive process ? CO2 [K_2]
   a) Milling b) Sawing
   c) EDM d) Stereo-lithography
5. STL file format is represented by interaction of _____ CO1 [K_2]
   a) lines and hexagons b) lines and triangles
   c) lines and rectangles d) lines and circles
6. Which programming language is commonly used for embedded system development? CO4 [K_2]
   a) Python b) Java
   c) C/C++ d) Ruby
7. Which of the following is NOT an essential component of an embedded system? CO3 [K_2]
   a) Microcontroller or microprocessor b) Memory
   c) Operating system d) Keyboard and mouse

8. What is the function of the setup() function in an Arduino sketch? CO2 [K2]

a) It is the main loop that runs continuously
b) It initializes the necessary libraries and variables
c) It defines the pin configurations for input and output
d) It uploads the sketch to the Arduino board

9. Which of the following is false about IoT devices? CO2 [K2]

a) IoT devices use the internet for collecting and sharing data
b) IoT devices need microcontrollers
c) IoT devices use wireless technology
d) IoT devices are completely safe

10. Which layer is used for wireless connection in IoT devices? CO2 [K2]

a) Application layer
b) Network layer
c) Data link layer
d) Transport layer

PART B (10 x 2 = 20 Marks)

11.	What is the difference between additive manufacturing and subtractive manufacturing?	CO2	[K1]
12.	What safety measures need to be taken before printing on an SLS printer?	CO1	[K1]
13.	What are the equipment used for reverse engineering?	CO2	[K1]
14.	List down the limitations in rapid prototyping?	CO2	[K2]
15.	What is the difference between a microcontroller and a microprocessor?	CO3	[K1]
16.	Explain the purpose of the "void loop()" function in an Arduino sketch.	CO1	[K2]
17.	What is the difference between analog and digital signals in the context of Arduino?	CO2	[K1]
18.	What are the benefits of IoT for businesses?	CO2	[K1]
19.	What are some of the challenges of IoT security?	CO1	[K1]
20.	How can the IoT be used in education?	CO2	[K1]

PART C (6 x 5 = 30 Marks)

21.	Derive the process of printing a part in an FDM machine?	CO1	[K2]
22.	List down any 5 common file types for 3D printing? with abbreviation?	CO1	[K1]
23.	Explain the difference between digital and analog signals in the context of Arduino. Provide examples of situations where each type of signal is commonly used.	CO4	[K2]
24.	Describe the key components of an embedded system and their functions. Provide examples to illustrate your answer.	CO2	[K2]
25.	Write and explain the code for interfacing the IR Sensor with arduino uno in a detailed way.	CO3	[K2]
26.	What are the different layers of the IoT protocol stack? Explain the purpose of each layer.	CO3	[K2]

Answer any FOUR Questions
PART D (4 x 10 = 40 Marks)

27.	Derive the process of loading and unloading the material onto an SLS printer?	CO1	[K2]
28.	What is called reverse engineering? Explain the process with suitable methods, machines and file formats?	CO2	[K2]
29.	Draw and explain the architecture of Arduino Uno?	CO1	[K4]
30.	Write and explain the code for interfacing the dc motor with arduino uno in a detailed way.	CO4	[K3]
31.	Discuss the potential benefits and challenges of using IoT in the healthcare industry.	CO2	[K2]

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