Department of Mechanical and Manufacturing Engineering
I Sem- M. Tech (Industrial Automation and Robotics)
Digital Manufacturing (MTE 5004)
End-semester Examination
Date: **Max Marks: 50**   **Time: 10.30 AM -11.30 PM**

		M	CO	PO	BL
1 a	Explain various vehicle guidance technologies used in automated material handling systems of the smart factories	4	1	7	2
1b	Describe the Building blocks of automation	4	1	7	2
1c	Explain four different error recovery strategies	2	1	7	2
2 a	Discuss the steps involved in cusomisation of product based on *Leonard and Rayport* guidlines	4	2	2	2
2 b	Describe the working of stereolithography and highlight the features of this process	4	2	2	4
2 c	What are the stumbling blocks for Rapid manufacturing methods	2	2	2	4
3 a	Explain the architecture for a database system	4	3	3	
3 b	For the E-R diagram shown below, write the SQL code to create the dabase and apply suitable constraints.	4	3	3	3
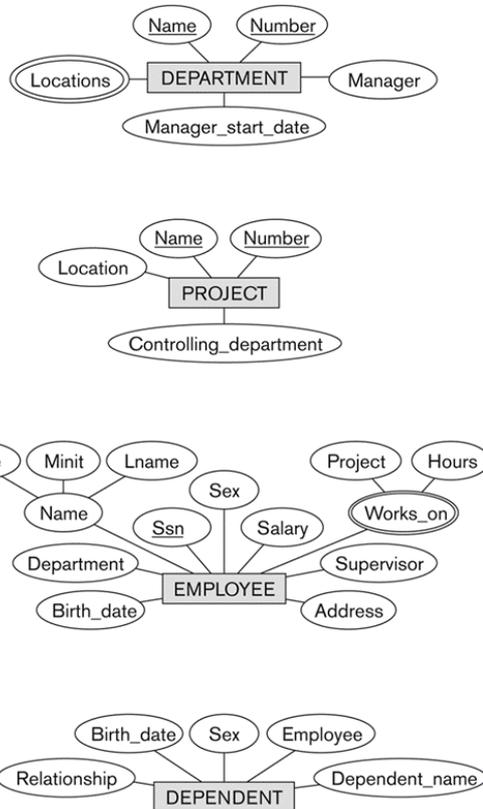
3 c	Define and Differntiate the **primary key** and **foreign key** with suitable example	2	3	3	4
4 a	Discuss the three dimensions of Digital Manufacturing	4	4	8	2
4 b	Explain the technology/tools of Digital manufacturing	4	4	8	2
4 c	Benefits of Digital Manufacturing	2	4	8	2
5 a	Explain the generalised process chain of rapid manufacturing process	4	2	2	2
5 b	For the data shown in the following table, write the SQL query for the following a) Identify the names of students with age greater than 21 b) Determine the average GPA of all students c) Find the name of student whos name starts with 'Be' d) Find the name and address of students whose phone number is not entered in entered in the database STUDENT 	Name	Ssn	Home_phone	Address	Office_phone	Age	Gpa
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Dick Davidson	422-11-2320	NULL	3452 Elgin Road	749-1253	25	3.53
Barbara Benson	533-69-1238	839-8461	7384 Fontana Lane	NULL	19	3.25
Rohan Panchal	489-22-1100	376-9821	265 Lark Lane	749-6492	28	3.93
Chung-cha Kim	381-62-1245	375-4409	125 Kirby Road	NULL	18	2.89
Benjamin Bayer	305-61-2435	373-1616	2918 Bluebonnet Lane	NULL	19	3.21		4	3	3	4
5 c	Explain what is Recursive Relationship Type with an example	2	3	3	2