Name: Enrolment No:	

UPES

End Semester Examination, May 2023

Course: Manufacturing Technology **Semester : VI**

Program: B. Tech Mechanical **Time : 03 hrs.**

Course Code: MECH3041 **Max. Marks : 100**

Instructions: Make use of sketches/plots to elaborate your answer. Brief and to-the-point, answers are expected. Assume suitable data if needed.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	With suitable example, explain the difference between precision and accuracy.	**4**	**CO1**
2	List any four linear measuring instruments with suitable example.	**4**	**C02**
3	Discuss the followings a) What is the need for tolerance? b) What are the limitations of interchangeable assembly?	**4**	**C01**
4	Illustrate the different types of problems that can be solved using the linear programming approach. Give five examples.	**4**	**C03**
5	When are qualitative forecasting techniques most useful as compared to quantitative, one.	**4**	**C01**

SECTION B
(4Qx10M= 40 Marks)

6	Distinguish between moving average, exponential smoothing and trend projection methods of forecasting with suitable example.	**10**	**CO3**
7	Discuss why CNC is better than conventional machine and illustrate the different types of CNC machine with neat sketch.	**10**	**C02**
8	A manufacturing firm has three proposals for a product. Either it can be purchased from an outside vendor at Rs, 4.00 per unit or it can be manufactured in-plant. There are two alternatives for in-plant manufacturing. Either, a fully automatic unit is procured, involving fixed cost of Rs. 30,000 and variable cost of Rs. 2.75 per unit. Alternatively, a semi-automatic unit would cost Rs. 20,000 as fixed, cost and Rs. 3.00 per unit as variable cost.	**10**	**CO3**

	Draw a break-even-chart for these alternatives. Suggest range of production-volume suited for these alternatives.		
9	In a limit system, the following limits are specified to give clearance between a shaft and a hole. $shaft\ 30^{-0.005}_{-0.018}\ mm\ \phi$ $Hole\ 30^{+0.020}_{-0.000}\ mm\ \phi$ Determine: i) Shaft and hole tolerance ii) The shaft and hole limits iii) The maximum and minimum clearance. **OR** Discuss the circumstances when you would use PERT as opposed to CPM in project management. Give some examples of projects where each would be more applicable than the other.	**10**	**C02**
	SECTION-C **(2Qx20M=40 Marks)**		
10	The precedence relationship for nine activities is given below. Find critical path and different floats/ slack: *Activity* A B C D E F G H *Duration* 9 9 10 4 7 3 8 7 *Precedence* – – – A B C D, E, F C	**20**	**C04**
11	Analyze the following cases to suggest the role of the Industrial Engineer. (a) All aerospace company that wants to modify the design of the next generation of airplane to be more efficient (b) A large, information technology company which has been producing hardware and software since the 80's . (c) An automobile manufacturer who wants to remain competitive by offering an innovative product (d) Managing a group of senior technologists (typically 50 years of age or older) (e) A university which wishes to improve its recruiting. (f) E-biz firm that deals with consumer durables (g) A new d·ot-com. company looking for new business areas (h) Firm dealing with developing portals, websites, etc. (i) Internet service provider (ISP) firm 698	**20**	**CO4**

	(j) Computer integrated manufacturing industry (k) Consultancy firm dealing with layout, reengineering, etc. (/) ERP-consultancy firm. **OR** Explain the steps involved in a graphical method to solve a linear programming problem. Solve following LP problem: Maximize: $Z = 20x + 10y$ Subject to: $5x + 4y < 24$ $2x + 5y < 13$ $x, y > 0$		