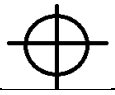
Name: **Enrolment No:**	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

Online End Semester Examination, May 2021

Programme Name: B.Tech Mechanical Engineering **Semester : VI**
Course Name : Manufacturing Technology **Time : 03 hrs**
Course Code : MEPD 3012 **Max. Marks : 100**
Nos. of page(s) : 3

SECTION A

S. No.		Marks	CO
Q 1	Mark true or false for below mentioned statements a) More skilled labor is required to use jigs and fixtures b) Locating pins should be wide apart in jigs and fixtures c) Cam operated clamps are more faster than wing nuts d) Stripper plate is an integral part of die set e) Uneven wall thickness provides sink mark on the final cast in injection molding	**5**	**CO1**
Q 2	Enlist various types of measurement standards and explain primary standard.	**5**	**CO2**
Q 3	Enter the type of geometric tolerance by the symbol mentioned i  ii  iii  iv  v 	**5**	**CO2**
Q 4	Enlist the advantage and disadvantages of interchangeable assembly	**5**	**CO3**
Q-5	A machine tool is having process capability of 0.01. Describe the meaning of this and suggest which type of machine tool is this.	**5**	**CO3**
Q-6	Define basic feasible solution, degenerate solution and optimum solution in transportation problem.	**5**	**CO4**

SECTION B

Q 7	a) Explain 3-2-1 principle of jigs and fixtures with the help of neat sketch. b) Identify the properties of cutting tool materials and describe any one advance cutting tool material containing described properties.	**10**	**CO1**

Q 8	Design the general type of GO and NO GO gauge for components having 30 H7/f8 fit. Use British system of gauge tolerance. Also draw the neat tolerance diagram of the solution for both GO and NO GO gauge. Given that: (a) $i = 0.453\sqrt[3]{D} + 0.001D$ (b) upper deviation of 'f' shaft = $-5.5\mathrm{D}^{0.41}$ (c) 30 mm falls in the diameter step of 18–30 mm (d) IT7 = 16i (e) IT8 = 25i	**10**	**CO2**
Q 9	Explain selective assembly approach. Enlist advantage and disadvantage of selective assemblies. **OR** Describe the procedure of process planning. Critically analyze and prepare a process plan for making metallic gears in small-scale industries. (assume the things by your own)	**10**	**CO3**
Q-10	Describe any two instruments used for linear measurements. **OR** Explain the principle of interferometry and describe the utilization of it in optical flats for angle measurement.	**10**	**CO2**
Q-11	A company is manufacturing two different types of product A and B. each product has to be produced on two different machines M1 and M2. Each unit of product A requires 2 hours on machine M1 and 1 hours on machine M2. While Product B requires 1 hour on machine M1 and 2 hour on machine M2. The available capacity of machine 1 is 104 hours and that of machine M2 is 76 hours. Profit per unit for product A is Rs. 6 and that of for product B is Rs. 11. a) Formulate the problem b) Find the optimum solution using graphical approach. (Show the approximate graph on blank sheet only.)	**10**	**CO4**
	SECTION-C		
Q 12	Solve below problem by simplex method $Maximize\ Z = 2X_1 + X_2 + 3X_3$ Subjected to $X_1 + X_2 + X_3 \leq 59$ $2X_1 + 3X_3 \leq 75$ $X_2 + 6X_3 \leq 54$ $X_1, X_2, X_3 \geq 0$ **OR** Find the optimum solution of the below transportation problem to minimize the cost.	**20**	**CO4**

Company	Retail			Supply
	R1	R2	R3	
P1	10	7	8	45
P2	15	12	9	15
P3	7	8	12	40
Demand	25	55	20	