Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

Online End Semester Examination, December 2020

Programme Name: B.Tech Mechanical Engineering Semester: V
Course Name: Manufacturing Processes
Time: 03 hrs

Course Code : MEPD 3011 Max. Marks : 100

Nos. of page(s) : 2

SECTION A

Answer	all questions		
S. No.		Marks	CO
Q 1	a) Enlist the types of chips formed in metal cutting.b) List out the conditions for formation of built up edge	5	CO-1
Q 2	Compare Advanced and conventional machining processes	5	CO-1
Q 3	 a) For making the cylindrical cup of 30mm diameter and 50 mm height by deep drawing process, diameter of blank required will bemm b) For punching the 80 mm hole in the mild steel sheet of thickness 2mm (shear strength = 100MPa), diameter of the punch and die will bemm andmm respectively 	5	CO-2
Q 4	Explain the effect of following parameters on the penetration and metal deposition rate in arc welding process. a) Polarity b) current	5	CO-3
Q-5	Compare top and bottom gating system.	5	CO-1
Q-6	Explain the effect of positive, zero and negative rake angle on the cutting forces.	5	CO3
	SECTION B below questions.		
Q 7	Explain the working principle of electro chemical machining. Derive the expression for MRR in electro chemical machining process OR Explain the working principle of electro discharge machining. Derive the expression for pulse on and pulse off time in case of R-C relaxation generator in EDM.	10	CO1
Q 8	a) Explain the Cain's principle of riser design in the metal casting.b) Explain the effect of type of gating system on the pouring time in metal casting process	10	CO3
Q 9	Differentiate between compound and progressive die with the help of neat sketch. A	10	CO2

			Т
	circular washer of inner diameter 20 mm and outer diameter 60mm has to made by		
	mild steel plate of thickness 1mm (shear strength 240 MPa) find out the machine		
	capacity in tons for		
	i. compound die		
	ii. Progressive die.		
	n. Trogressive die.		
Q-10	a) Create a heat balance equation in the resistance welding process.		
	b) Creating a part by powder metallurgy process as compare to conventional	10	00.4
	manufacturing process will leads to some advantages and disadvantages.	10	CO-4
	Enlist them.		
Q-11	Describe oxy acetylene welding process with the help of neat sketch. Explain the		
	functions of various types of oxy acetylene flames.		
	The state of the s		
	OR	10	CO-3
	Describe the effect of constant current and constant voltage characteristics of power		
	source on the type of arc welding process.		
	SECTION-C		
	SECTION-C		
Q 12	In an orthogonal cutting operation the following data is given		
¥ 1-	Cutting force:- 1500N tool signature:- 10-12-8-15-14-18-3		
	Thrust force: - 700N feed: - 0.8 mm/rev thickness of the chip: - 3.2mm		
	A		
	Cutting velocity:- 18 m/min depth of cut:- 2mm		
	Calculate the following based on the merchant's theory		
	· · · · · · · · · · · · · · · · · · ·		
	a. Friction force and normal to friction force and friction angle		
	b. Shear strength and normal stress on the shear plane		
	c. Shear plane velocity and chip velocity		
	d. Power consumed in friction, shear deformation and total power		
	consumption		
	e. Specific energy for cutting	20	CO2
			COZ
	OR		
	Attempt all the parts below		
	a) A cup of 10 cm height and 5 cm diameter is to be made from a sheet of two		
	mm thickness. Find out the number of draws required.		
	h) Derive the expression for sheer plane and a using outhors and extring model		
	b) Derive the expression for shear plane angle using orthogonal cutting model.		
	The end of the pipe is orthogonally cut with the tool of -10^0 rake angle. The		
1	chip thickness measured was 0.8 mm whereas the feed was 0.3 mm/ rev.		1
	determine the shear plane angle.		