Name:

Enrolment No:

Semester : V

Max. Marks: 100

: 03 hrs

Time

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

Online End Semester Examination, December 2020

Programme Name:B.Tech Mechatronics EngineeringCourse Name:Manufacturing Technology

Course Code : MEPD 3010 Nos. of page(s) : 2

SECTION A

	SECTION A		
Answer	all the questions	1	r
S. No.		Marks	CO
Q 1	 Recognize the process as per the statement given below and name them a) Liquid metal is poured into the cavity to give the final shape b) A wire spool is used as an electrode in the process c) Material is removed from the surface by to and fro motion of cutting tool d) Diameter of the job is reduced to produce the final shape e) Flame form by the burning of acetylene is used for the joining of the parts 	5	CO-1
Q 2	List out the functions of electrode coating in arc welding process	5	CO-1
Q 3	 Marks true or false in below mentioned statements a) In the shaper machine, cutting velocity is given to the job while feed is given to the table. b) Lathe is a cutting tool c) Chip thickness will always less than uncut chip thickness d) Tool should always be harder than the job for performing the cutting operation e) The shear plane is actually a shear zone in reality. 	5	CO-2
Q 4	Enlist the advantages of investment casting over sand casting technique	5	CO-2
Q-5	Distinguish between tolerance and allowance.	5	CO-1
Q-6	For turning a job of length 200 mm and diameter 50 mm by lathe machine at 300 rpm, feed of 0.3 mm/rev is used. Enter the value of cutting velocity and machining time.	5	со-з
	SECTION B		
Answer	all questions		
Q 7	Describe the geometry of single point cutting with help of neat sketch. Explain the significance of all angles.	10	CO2
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	CO4
Q 9	Two metallic sheets each of which 2mm thickness are welded by in lab joint	10	CO3

Q-10	 configuration by resistance spot welding at a welding current of 10 KA and welding time of 20 milliseconds. A spherical fusion zone extending up to full thickness of each sheet is formed. The effective resistance is 80 micro ohms, density 7500 kg/m³, latent heat 200 KJ/kg, Cp is 850 J/Kg K, melting temperature 1900K, ambient temperature 293K. Find the melting efficiency. a) Analyze the metal cutting process for finding the favorable conditions for the favorable conditions for the favorable conditions. 		
	formation of built up edge.b) Describe the types of wear in metal cutting operation.	10	CO-4
Q-11	Describe oxy acetylene welding process with the help of neat sketch. Explain the functions of various types of oxy acetylene flames. OR Describe the effect of constant current and constant voltage characteristics of power	10	CO-2
	source on the type of arc welding process. SECTION-C		
Answe	r below question		
Q 12	In an orthogonal cutting operation the following data is given 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 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	
	OR	20	CO3
	 Attempt all the parts below a) An interchangeable assembly is used with shaft of size 80.00 +0.093 -0.071 and hole of size 80.00 +0.035 -0.000. Draw the tolerance diagram and find out the value of allowance, type of fit, what is the greatest amount of clearance or interference. Also expalin the other types fits in selective assembly. b) Derive the expression for shear plane angle using orthogonal cutting model. The end of the pipe is orthogonally cut with the tool of -10⁰ rake angle. The chip thickness measured was 0.8 mm whereas the feed was 0.3 mm/ rev. determine the shear plane angle. 		