

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2019

Programme Name: B.Tech Mechanical Engineering

Course Name : Manufacturing Technology I

Course Code : MEPD 2004

Nos. of page(s) : 2

Semester : IV

Time : 03 hrs

Max. Marks : 100

Instructions:

SECTION A

S. No.		Marks	CO
Q 1	Classify Metal-forming Processes. Define wire drawing and extrusion process	5	CO-1
Q 2	Differentiate between the misrun and cold shut defect in metal casting.	5	CO-2
Q 3	Enlist the various functions of electrode coating in manual metal arc welding process.	5	CO-3
Q 4	Define draft in rolling process. A plate of 60mm thickness has to be rolled between the rolls of radius 300-mm. Coefficient of friction between rolls and the plate surface is 0.2. Find the minimum possible thickness of the plate at the exit of the rolls.	5	CO-4

SECTION B

Q 5	Derive the time required for the filling of cavity of height h_m , using a) Top gating system b) Bottom gating system	10	CO2
Q 6	Describe oxy acetylene welding process with the help of neat sketch. Explain the functions of various types of oxy acetylene flames.	10	CO3
Q 7	Explain the following: a) Punching and Blanking b) Mechanism of shearing in sheet metal. c) Effect of clearance provide in shearing.	10	CO5
Q-8	Describe the powder metallurgy process in detail. Give its advantages and disadvantages over general manufacturing methods. OR Explain various methods for metallic powder production in powder metallurgy process.	10	CO-1

SECTION-C

Q 9	a) Differentiate between compound and progressive die with the help of neat sketch. A 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	20	CO5
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	<ul style="list-style-type: none"> i. compound die ii. Progressive die <p>b) For punching a 15mm circular hole and cutting a rectangular blank of 50x 200 mm from a sheet of 1mm thickness (mild steel shear strength 240 MPa). Calculate in each case :</p> <ul style="list-style-type: none"> i. size of the punch ii. Size of the die iii. Force required 		
Q-10	<p>Derive the expression of forging pressure and forging force in case of open die forging of a slab. Consider combined sliding and sticking condition.</p> <p style="text-align: center;">OR</p> <p>Attempt both a) and b)</p> <p>a) An engineering Material has an ultimate tensile strength of 380 MPa. This material is having strain-hardening coefficient of 0.3. find</p> <ul style="list-style-type: none"> i. True stress and true strain relationship for this material (5) ii. For true stress of 325 MPa what will be the engineering strain developed. (5) <p>b) A plate of thickness 100mm and width 300mm is to be rolled for reducing its thickness to 20mm. following are the data given for the process. Roll radius = 400mm coefficient of friction= 0.2 roller speed = 50 RPM Assume that material follows the power law in which value of strength coefficient is 500MPa and strain hardening exponent is n=0.3. find</p> <ul style="list-style-type: none"> i. Number rolling passes required. (5) ii. Torque and power required for one pass of rolling. Take value of a= 0.5 and average flow stresses as a value of average rolling pressure. (5) 	20	CO-4