PAPER ID : 4081

TME-402 Printed Pages : 3

Paper ID and Roll No. to be filled in your Answer Book

Roll No. | 1 | 1 | 0 | 3 | 3 | 0 | 1 | 0 | 4 | 0 | 1 | 0 |

B. Tech.

(SEM. IV) (EVEN SEM.) EXAMINATION, 2013

MANUFACTURING SCIENCE - I

Time : **3** Hours] [Total Marks : **100**

Note : Attempt all questions, the marks assigned to each question is indicated at question itself

1 Attempt any **four** parts : **5×4=20**

(a) Why are materials and design important to manufacturing process?

(b) What do you understand by yield's criteria's for ductile materials? Find out the relation between von-Mises and Tresca's yield's criterias

(c) Differentiate briefly between hot working and cold working

(d) Describe theories of plastic deformation (failure)

(e) Discuss briefly the advantage and limitations of forged products/components

(f) Derive the equation for the pressure distribution for the forging of rectangular block (BxHxW) in case of sliding friction.

2 Attempt any **four** parts : 5×4=20

(a) A circular disc of 150 mm diameter and 100 mm thickness is compressed between two flat dies. Determine sticking radius and total load on dies. Assume μ=0.2 and tensile yield stress to be 210 MPa

(b) Prove that in case of rolling
Maximum draft = μ^2 R Where μ = coefficient of friction between roll and strip R= radius of roll

(c) Explain in brief effects of friction in forming operations

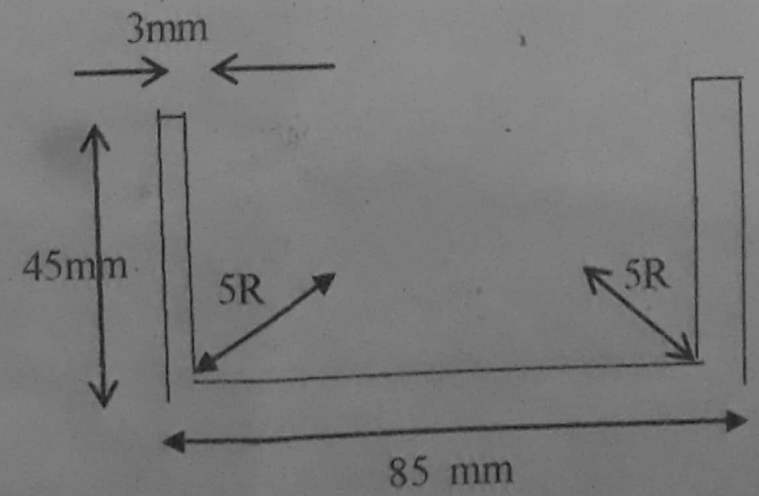
(d) Explain the role of lubrication in forming operations

(e) Write detailed notes on rolling mills.

3 Attempt any **two** parts : 10×2=20

(a) What is the role of clearance in blanking and piercing operations? How are clearances provided on punch and die? Discuss the factors deciding these clearances.

(b) Calculate the length of sheet for making the components as shown in figure below. The sheet is 3 mm thick. Also determine the bending force required if the ultimate tensile strength of material is 3500kg/cm2. Take die radius as 8mm and bend length as 1300 mm.



(c) What are the different types of shearing dies? Describe the constructional features and working of a compound die.

4 Attempt any **two** parts : 10×2=20

(a) Write short notes on :

i. Injection moulding

ii. Extrusion of plastics

(b) What are the economic aspects of the use of jigs and fixtures? Differentiate between jigs and fixtures

(c) Describe briefly each step involved in powder metallurgy process. Also mention 6the advantages, disadvantages and applications of powder metallurgy

5 Attempt any two parts the following : 10×2=20

(a) Describe the desirable properties of a moulding sand? And state what defects may arise in absence/lack of these? Also mention other types of casting defects.

(b) Write short notes on any two

i. Shell moulding

ii. Lost foam casting

iii. Centrifugal casting

(c) Give details of solidification of casting.