Sem IV

Lax1-D:\Data-81 Production Process-II / MECH / 11.12.13

Con. 5752-13. **LJ-10556**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question number **1** is **compulsory**.
(2) Attempt any **four** from remaining **six** questions.
(3) **All** questions carry **equal** marks.
(3) Missing data can be suitably assumed.

1. Write short notes on any **four** :– **20**
   (a) Centee of pressure.
   (b) Types of Rolling Mills.
   (c) Gear hobbing.
   (d) Turning fixture.
   (e) Tool dynamometer.

2. a) Calculate and Design a round pull type broach for machining hole of diameter 35H7 and length 20mm in a work piece of carbon steel. **10**
   Specific cutting force = 4200N/mm², IT7 = 0·025mm, Tooth rise = 0·03mm cutting speed in broaching = 8m/min.
   Draw the broach and indicate designed Value.
   b) Determine and design a circular form tool graphically, to cut a Semicircular groove in the cylindrical work piece whose details are given below:– **10**
   Minimum Radius = 60mm
   Maximum Radius = 40mm
   Assume Rake and Relief angle as 10° and 6° Respectively.

3. a) Prove that the relationship $2\phi + \beta - \gamma = \pi/2$ holds good in Orthogonal cutting, where ϕ = shear angle, β = frictional angle, γ = Rake angle. Also state your assumptions. **10**
   b) Discuss any tow of the following:– **10**
   (i) Different types of rolling mills.
   (ii) Torque and Power Calculation in rolling.
   (iii) Types of Jig bushes.

4. a) Discuss the steps of designing drill jig. **10**
   b) A Slab milling operation is performed Under the foll conditions. **10**
   Cutter dia = 100mm
   No. of teeth = 30
   Helix angle of cutting Edge = 15°
   Depth of cut = 7·5mm

TURN OVER

Con. 5752-LJ-10556-13.

5. a) Explain the Various steps involved in the design of circular pull type broach Draw the neat sketches. **10**

   b) Compare jigs and fixtures and Explain locating and clamping Elements used in Jigs and Fixtures. **10**

6. a) A steel shaft 50mm diameter is required to be turned through distance of 300mm. On an Engine lathe. Depth of cut is 6mm and the rate of feed 0·2mm/rew. Two types of tools are available for this purpose. **10**
   (i) HSS
   (II) Tungsten carbide.
   The following are the data available.

Tool Material	Tool life (min)	Cutting speed (meter/min)	Tool changing Time (min)
H.S.S	20	40	3
	35	31	
Tungsten Carbide	15	125	3
	45	85	

   b) Distinguish between :– **10**
   (i) Compound and progressing die.
   (ii) Drilling and Milling Fixture.

7. a) Draw the nomenclature of plain milling cutter and Explain the procedure of designing a plain milling cutter. **10**

   b) Explain the following :– **10**
   (i) 'C'- clamp and Captive 'C' clamp.
   (ii) Open type jig and channel type jig.

Correction Received from University – Through – Email.

S.E. Sem-IV Mechanical
PRODUCTION PROCESS-II **Paper code –LJ 10556**

4b. A slab milling operation is performed under following conditions:

cutter diameter= 100mm
no of teeth=30
helix angle of cutting edge=15 degree
depth of cut=7.5mm
width of cutter=80mm
RPM of cutter 165
table velocity 80mm/min
size of job 150*60mm

find (i) maximum uncut chip thickness & length of uncut chip
(ii) height of feed ridges
(iii)maximum number of cutting edges cutting simultaneously.
(iv)minimum depth of cut to be employed with this cutter.

6a) below the table please add the statement

HSS Costs an average of Rs.30 per edge and carbide cost Rs 75 per edge. take the operating cost as Rs.120 per hour. analyze the selection of the tool material based on minimum cost of machining.