Total No. of Questions—**12**] [Total No. of Printed Pages—**4+2**

[3762]-121

S.E. (Mechanical) (II Sem.) EXAMINATION, 2010

PRODUCTION TECHNOLOGY

(2008 COURSE)

Time : Three Hours **Maximum Marks : 100**

N.B. :— (*i*) Attempt *one* question of each Unit from Section I and Section II.

(*ii*) Answers to the two Sections should be written in separate answer-books.

(*iii*) Draw neat diagrams wherever necessary.

(*iv*) Assume suitable data if required.

SECTION I

Unit I

1. (*a*) List the various types of chips produced during metal cutting. Describe the conditions in which these types of chips are produced. [8]

(*b*) A job of 40 mm in diameter is being turned on lathe with a tool having a rake angle 31° and feed 0.15 mm/rev. The length of the chip over one revolution of workpiece is 67 mm. The cutting speed is 12 m/min. The tangential force is 415 N and feed force is 175 N : [10]

Calculate :

(*i*) Coefficient of friction on the rake face.

P.T.O.

(*ii*) Thickness of chip

(*iii*) Angle of shear

(*iv*) Velocity of shear

(*v*) Velocity of chip along tool face.

Or

2. (*a*) What are the important factors which are to be considered while selecting cutting fluid ? Discuss various types of cutting fluid. [8]

(*b*) A tool with 18° rake angle is making an orthogonal cut 3 mm wide, at a speed of 31 mpm and feed of 0.25 mm. The chip thickness ratio is 0.55, cutting force is 1392 N and feed force as 363 N. Find : [10]

(*i*) Chip thickness

(*ii*) Shear plane angle

(*iii*) Coefficient of friction on tool face

(*iv*) Shear force on shear plane

(*v*) Energy consumed in kW min per cubic centimeter of meta removed.

Unit II

3. (*a*) Explain the principle of gear hobbing. List advantages and limitations of gear hobbing. [8]

(*b*) Explain various types of broaching machines with neat sketches. [8]

Or

4. (*a*) Explain the principle of gear shaping. List advantages and limitations of gear shaping. [8]

(*b*) What are the different methods of thread manufacturing ? Explain any two with a neat sketch. [8]

Unit III

5. (*a*) Write short notes on the following : [8]

(*i*) Machining centers

(*ii*) Tool magazines.

(*b*) Draw block diagram of DNC system and compare DNC and CNC system. [8]

Or

6. (*a*) Explain linear and circular interpolation with neat sketches. [8]

(*b*) Explain the following codes : [8]

(*i*) G91

(*ii*) G84

(*iii*) M05

(*iv*) G63

(*v*) M08

(*vi*) M11

(*vii*) M04

(*viii*) G88.

SECTION II

Unit IV

7. (*a*) Describe the following terms : [8]

(*i*) Clearance

(*ii*) Centre of pressure

(*iii*) Shear on punch and die

(*iv*) Sheet utilization ratio

(*b*) The washer of 30 mm OD and 15 mm ID are to be made by press work from a PCS sheet of 1 mm thickness considering elastic recovery of material, find :

(*i*) Clearance

(*ii*) Piercing die and punch sizes

(*iii*) Blanking die and punch sizes. [8]

Or

8. (*a*) A hole of 50 mm dia. is to be produced in a steel plate of 2 mm thick. The ultimate shear strength of material is 440 N/mm^2. If punching force is to be reduced half the force using a punch without shear. Estimate amount of shear on punch. Take percentage of penetration 35%. [8]

(*b*) What are the various types of stripper ? Explain their function with the help of suitable sketches. [8]

Unit V

9. (*a*) Explain with neat sketch the electro-chemical process with its advantages, limitations and applications. [8]

(*b*) Explain with graph the effect of amplitude, frequency, abrasive grain size, feed force on MRR in case of USM. [8]

Or

10. (*a*) What is LASER ? Explain how LASER is used to machine the parts and state its process characteristics. [8]

(*b*) With sketch explain AJM. Discuss the factors affecting the MRR. [8]

Unit VI

11. (*a*) What is locator ? Explain different types of locator used while locating a component in jig or fixture. [8]

(*b*) Draw minimum two views of the working drawing of drilling jig for drilling 4 holes of diameter 8 mm for component shown in Fig. 1 and also show the important elements like locater, bush jig plate, clamps. [10]

Or

12. (*a*) Explain renewable an slip bushes with a neat sketch. [8]

(*b*) Draw minimum two views of the working drawing of milling fixture for milling a slot of 10 mm wide, 5 mm deep and

30 mm in length for component shown in Fig 1 and also show that important elements like locater, setting block, clamps. [10]

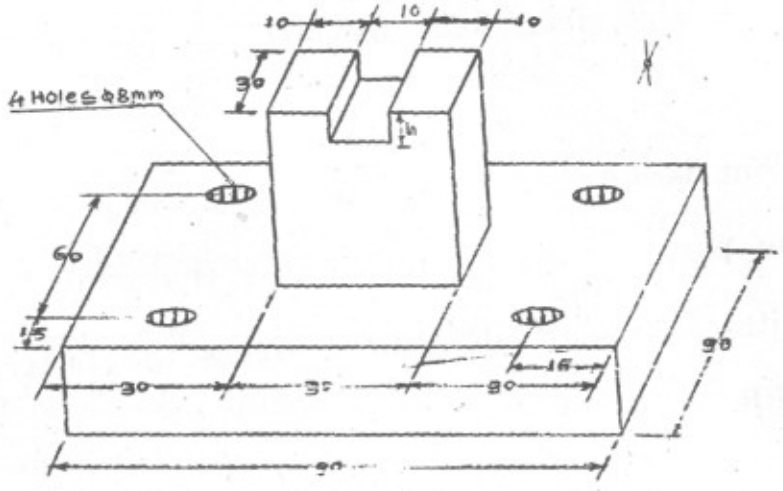

Fig. 1