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

Seat No.	

[4757]-120

S.E. (Mech./Auto.) (Second Semester) EXAMINATION, 2015

PRODUCTION TECHNOLOGY

(2008 PATTERN)

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

N.B. **:—** (*i*) Answer any *three* questions from each section.

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

(*iii*) Figures to the right indicate full marks.

(*iv*) Neat diagrams must be drawn whenever necessary.

(*v*) Assume suitable data, if necessary.

SECTION I

1. (*a*) A tool with 18° rake angle is making an orthogonal cut, 3 mm wide, at a speed of 31 rpm 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

P.T.O.

(*ii*) Shear plane angle

(*iii*) Coefficient of friction on tool force

(*iv*) Shear force on shear plane

(*v*) Energy consumes in kW min/cm^3.

(*b*) State the factors which affect tool life. [6]

Or

2. (*a*) The following equation or tool life is given in turning $VT^{0.13} f^{0.77} d^{0.37} = c$.

A 60 minute tool life was obtained while cutting at v = 30 m/min, f = 0.3 mm/rev and d = 2.5 mm. Determine the change in tool life if the cutting speed, feed and depth of cut are increased by 20% individually and also taken together. [10]

(*b*) Sketch and explain the Merchant's circle of cutting forces. [6]

3. (*a*) Explain various types of broaching machine. [6]

(*b*) Explain thread rolling process with neat sketch. [5]

(*c*) What is gear hobbing ? Explain gear hobbing principle. [5]

Or

4. (*a*) Draw the neat sketch of broach geometry detail. [6]

(*b*) Explain the concept of gear shaping process with neat sketch. [5]

(*c*) What is a thread chaser ? Briefly describe it. [5]

5. (*a*) Explain the classification of NC system according to motion control system. [6]

(*b*) Differentiate between Open Loop and Closed Loop CNC System. [6]

(*c*) Write short notes on (any *two*) : [6]

(*i*) Machine center

(*ii*) FMS

(*iii*) DNC.

Or

6. (*a*) Draw a block diagram of CNC system and explain the function of it. State advantages and limitations of it. [6]

(*b*) Explain the classification of NC system according to tool positioning with suitable example. [6]

(*c*) Write the function of the following codes : [6]

G71, G90, G33, M02, M04, M08.

SECTION II

7. (*a*) Explain various methods of reducing shear forces. [6]

(*b*) For the work piece made up of copper plate of thickness 2 mm. Design : [8]

(*i*) blanking die

(*ii*) blanking punch

(*iii*) press tonnage

(*iv*) strip layout for single die. Shear strength for copper is 280 N/mm^2.

Assume clearance is 5% of thickness.

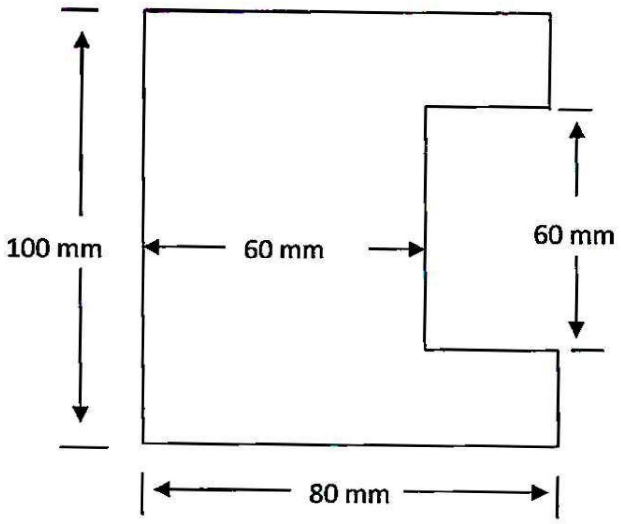

Fig. 1

(*c*) Differentiate between bending and drawing. [4]

Or

8. (*a*) Determine center of pressure for the same component shown in figure 1. [6]

(*b*) Explain function of each element of simple die with neat sketch. [8]

(*c*) Define (any *two*) : [4]

(*i*) Pilot

(*ii*) Shut height

(*iii*) Shear.

9. (*a*) Draw self explanatory diagram of AJM. [4]

(*b*) Explain why EBM process is carried out in vacuum. [4]

(*c*) What are the requirements of tool material for EDM. Name common tool materials. [4]

(*d*) What is difference between USM and conventional grinding ? [4]

Or

10. (*a*) Enlist applications of IBM and PAM. [6]

(*b*) Explain working of Laser beam machining with neat sketch. [6]

(*c*) Enlist advantages and limitations of ECM. [4]

11. (*a*) What are the general guiding principals of fixture design ? [6]

(*b*) Describe quick acting clamping device with neat sketch. [6]

(*c*) Explain working of channel type jig with neat sketch. [4]

Or

12. (*a*) Write a short note on bushes used in jigs. [6]

(*b*) Explain principal of redundant location and principal of fool proofing with neat sketch. [6]

(*c*) Design and sketch drill jig for drilling two holes of ϕ 8 mm in the part as shown in figure 2. [4]

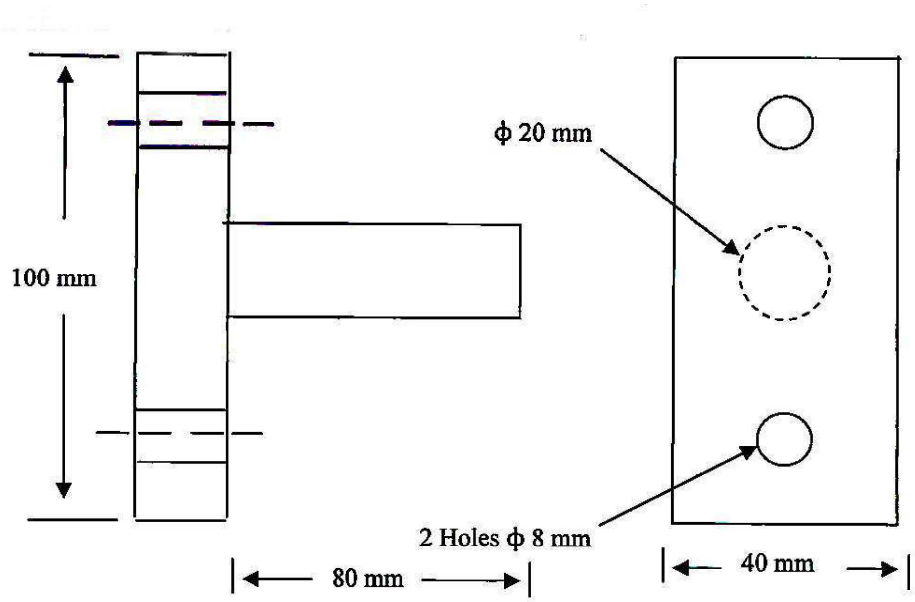

Fig. 2