Total No. of Questions—**12**] [Total No. of Printed Pages—**4+1**

Seat No.	

[4857]-120

S.E. (Mechanical/Automobile) (II Sem.) EXAMINATION, 2015

PRODUCTION TECHNOLOGY

(2008 PATTERN)

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

N.B. **:—** (*i*) Answer *three* questions from Section I and *three* questions from Section II.

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

(*iii*) Neat diagrams must be drawn wherever necessary.

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

(*v*) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.

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

SECTION I

UNIT I

1. (*a*) With neat sketch explain the tool signature in ORS system. [6]

(*b*) The following equation for tool life is given for a turning operation, VT0.13, *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 as also taken together. [12]

P.T.O.

Or

2. (*a*) Sketch a Merchant's circle force diagram and explain the different quantities involved. State the various assumptions made. [6]

(*b*) During machining of C-25 steel with 0-10-6-6-8-90-1 mm (ORS) shaped tripled carbide cutting tool, the following observations have been made : Depth of cut = 2 mm, Feed = 0.2 mm/rev, Speed = 200 m/min, Tangential cutting force = 1600 N, Feed thrust force = 850 N, Chip thickness = 0.39 mm.

Calculate :

(*i*) Shear angle,

(*ii*) Normal force at shear angle,

(*iii*) Friction force,

(*iv*) Kinetic coefficient of friction,

(*v*) Specific cutting energy. [12]

UNIT II

3. (*a*) Classify the different thread cutting methods. Explain the process and principle of thread rolling with neat sketch. [8]

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

Or

4. (*a*) Describe with neat sketch the detailed terminology of pull type internal broach. [8]

(*b*) Explain the principle of Gear Shaping and Gear Shaving. [8]

UNIT III

5. (*a*) What is a machining center ? List the main advantages of a machining center. [6]

(*b*) Explain the following M-codes and G-codes :

(*i*) G90

(*ii*) G02

(*iii*) G63

(*iv*) G41

(*v*) M05

(*vi*) M06

(*vii*) M11

(*viii*) M30. [10]

Or

6. (*a*) Draw block diagram of NC and DNC machine system. Compare NC and DNC system. [8]

(*b*) Differentiate between absolute and incremental positioning system in a CNC. [8]

SECTION II

UNIT IV

7. (*a*) Define electrical discharge machining. What are the functions of dielectrical fluid used in EDM ? What the dielectrical fluid commonly used in EDM ? [8]

(*b*) Explain the principle of plasma arc machining. [4]

(*c*) Explain why EBM process is performed usually in Vacuum Chamber. [4]

Or

8. (*a*) Explain the working of AJM. List common abrasive used in AJM. Discuss various parameters affecting the process. [8]

(*b*) Draw the schematic diagram of Ultrasonic machining operation. [4]

(*c*) State and explain the various factors affecting MRR in EDM process. [4]

UNIT V

9. (*a*) A cup of 60 mm outer diameter and 70 mm depth is to be drawn from 1.0 mm thick cold roller steel, with tensile strength of 410 mpa, the corner radius is 1.5 mm. Find the following :

(*i*) size of the blank

(*ii*) number of draw

(*iii*) punch and die radii (R)

(*iv*) Die-clearance

(*v*) drawing pressure. [10]

(*b*) What is strip layout ? What factor should be considered during strip layout ? [5]

(*c*) Draw sketch compound die. [3]

Or

10. (*a*) Find the total pressure, dimensions of tools to produce a washer of 5.5 cm outer diameter with cm diameter hole, from a material of 4 mm thickness, having shear strength of 350 m/mm^2. [6]

(*b*) Estimate the blanking force of cut a blank of 20 mm wide and 30 mm long from a 1.2 mm thick metal strip if the ultimate shearing strength of the material is 450 n/mm^2, also find the work done if the percentage penetration is 30% of the thickness. [6]

(*c*) Method of reducing cutting forces in sheet metal work. [6]

UNIT VI

11. (*a*) State various types of clamping device used in jig and fixture. [8]

(*b*) Explain different types of drill bushes in jig with neat sketches. [8]

Or

12. (*a*) What is the principle of "Six point location" ? [6]

(*b*) How are jigs classified ? Explain any *one* in detail. [5]

(*c*) Explain the indexing of jig and fixture. [5]