

Total No. of Questions—12]

[Total No. of Printed Pages—4+1

[3762]-30

S.E. (Mechanical) (Second Semester) EXAMINATION, 2010

MANUFACTURING PROCESSES—II

(2003 COURSE)

Time : Three Hours

Maximum Marks : 100

- N.B. :—**
- (i) From Section I solve Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6 and from Section II solve Q. 7 or Q. 8, Q. 9 or Q. 10, Q. 11 or Q. 12.
 - (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) Assume suitable data, if necessary.

SECTION I

1. (a) A seamless tube of 50 mm outside diameter is turned on lathe with cutting speed of 20 m/min. The tool rake angle is 20° and feed rate is 0.15 mm/rev. The length of chip in one revolution measures 80 mm. Calculate :
- (i) Chip thickness ratio

P.T.O.

- (ii) Shear plane angle
- (iii) Shear flow speed
- (iv) Shear strain. [8]
- (b) Draw Merchant's circle of forces. [3]
- (c) What are the types of chips ? Explain its characteristics and effect in machining. [5]

Or

2. (a) During machining of an alloy steel with tool having geometry $0^\circ-5^\circ-6^\circ-6^\circ-8^\circ-80^\circ-1$ mm ORS, the tangential force and axial force measured by dynamometer to be 300 N and 150 N respectively. Calculate the radial force, frictional force and coefficient of friction at the chip tool interface. [6]
- (b) What is Tool Life ? What are variables affecting tool life ? [5]
- (c) What are the functions of cutting fluids ? [5]
3. (a) Differentiate between gear shaping and gear hobbing. [6]
- (b) Explain with the schematic diagram the principle of thread cutting on lathe. [4]
- (c) With the help of a simple sketch explain a horizontal broaching machine. [6]

Or

4. (a) Explain gear shaving with sketch of gear shaving cutter. [4]
(b) What is indexing ? How and why is it performed for gear manufacturing ? [6]
(c) Write a note on Thread Grinding. [6]
5. (a) Write a short note on machining centre with block diagram. [6]
(b) How do you classify NC systems ? Explain. [6]
(c) What are 'C' and 'M' Codes ? Explain with an example. [6]

Or

6. (a) Explain the meaning of every word written in the following line :
G01 X30 Z30 M03 T01 F50 E0B. [6]
(b) Write a short note on FMS. [6]
(c) Differentiate between NC, CNC and DNC systems. [6]

SECTION II

7. (a) Explain with a neat sketch EDM process. State its advantages, limitations and applications. [8]
(b) What is LASER ? Explain, how LASER is used to machine the parts. Differentiate between LBM and EBM. [8]

Or

8. Explain with a neat sketch the following processes. State its advantages, limitations and applications : [16]

(i) USM

(ii) ECM.

9. (a) A washer with ID 12 mm and OD 30 mm is made from 2 mm thick strip of steel on progressive die.

Given : (i) Ultimate shear strength 250 N/mm^2

(ii) Strip length 2500 mm.

(i) Draw strip layout and find out material utilization. [6]

(ii) Calculate cutting force and press tonnage with staggering and full shear. [6]

(b) Explain the difference between coining and embossing. [4]

Or

10. (a) What is pilot ? Explain different types of pilots in press tool. [4]

(b) Explain the following terms :

(i) Perforating

(ii) Punching

(iii) Piercing

(iv) Blanking

(v) Shaving

(vi) Bending. [6]

(c) Draw neat sketch of Drawing Die. [6]

11. (a) Define jigs and fixture. Differentiate between them. [5]

(b) State various types of clamping devices used in jig and fixtures and explain any *one* in detail. [5]

(c) Write notes on :

(i) Conical locators

(ii) Strap clamp. [8]

Or

12. Write short notes on any *three* : [18]

(i) Brooching fixture

(ii) Turning fixture

(iii) Milling fixture

(iv) Indexing method used in jig.