Roll No. .....

24169

B. Tech. 4th Semester (ME)

Examination – May, 2017

MANUFACTURING TECHNOLOGY - I

Paper : ME-202-F

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

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Section. Question No. **1** is ***compulsory***. All questions carry equal marks.

1. Discuss the following : $5 \times 4 = 20$

(a) Mechanics of chips formation.

(b) Locating and clamping devices with example.

(c) Pattern allowances.

(d) Thermit welding

SECTION – A

2. (a) Discuss the nomenclature of single point cutting tool with various tool elements. 10

(b) A work piece is being cut at 1.25 m/s and power is found to be 2.05 kW. The feed is 0.25 mm/rev. and the depth of cut is 5 mm. estimate : 10

(i) Cutting force in N

(ii) Unit power consumption

3. (a) For a metal machining, the following information is available : 10

Tool change time = 8 min ; Tool regrind time = 5 min ; Machine running cost = Rs. 5 per hour ; Total depreciation per regrind = 30 p ; n = 0.25 ; C = 150. Calculate the optimum cutting speed.

(b) Estimate the moment, thrust force and power required for 12.7 mm. drill having a feed of 0.254 mm/rev. turning at 100 rpm, cutting a steel of Brinell hardness 200. 10

SECTION – B

4. (a) Discuss the design principles for drilling jigs. Also discuss the types of drill bushes in detail. 10

(b) Discuss the rolling process of metals with detailed geometry of rolling process. 10

5. (a) An aluminum alloy is hot extruded at 400°C through square dies without lubrication, from

15 cm diameter to 5 cm diameter. The extrusion speed is 5 cm/s. The flow stress of the material at the above temperature is 250 Mpa. The length of the billet is 37.5 cm. Determine the extrusion load. 10

(b) How will you measure external dovetail, internal dovetail and angle of dovetail with the help of precision balls and rollers ? 10

SECTION – C

6. (a) Discuss the principles, main parts and applications of turret and capstan lathe. 10

(b) What are the various types of tools and equipments used in foundry ? 10

7. (a) What is a planer ? Illustrate and describe its working principle. Also list the classification of planers. 10

(b) Discuss various sand casting defects and their remedies in detail. 10

SECTION – D

8. (a) Discuss the process of submerged arc welding stating its advantages and limitations. 10

(b) Discuss the process of hot and cold spinning stating their advantages and specific uses. 10

9. (a) Describe electron beam welding with its principle, applications and advantages in detail. 10

(b) Discuss the hand tools commonly used in sheet metal work. Also discuss the various methods used for laying out a pattern. 10
