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**

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 × 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**