

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 *free* 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

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- 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

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