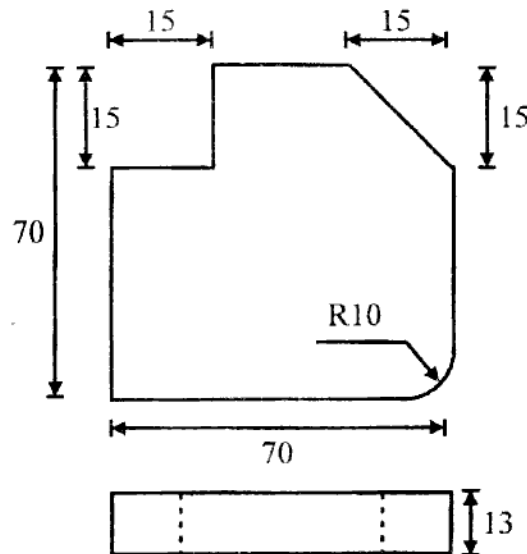




- Notes :
1. Answer **any three** question from Section A and **any three** question from Section B.
  2. Due credit will be given to neatness and adequate dimensions.
  3. Assume suitable data wherever necessary.
  4. Illustrate your answer necessary with the help of neat sketches.
  5. Use of pen Blue/Black ink/refill only for writing the answer book.

**SECTION - A**

1. a) The equation of tool life is given as  $VT^{0.15} V_f^{0.79} d^{0.39} = C$  7  
 A 50 min tool life was obtain while cutting at  $V = 25$  m/min  $f = 0$  mm/rev.  $d = 2.5$  mm. Determine change in tool life if cutting speed, feed and depth of cut are increased by 30% individually and also taken together .
- b) What is "machinability" and discuss the variables affecting an machinability ? 6
2. a) Derive the expression for optimum cutting speed for minimum cost in turning operation. 5
- b) Prepare the part program for making the component as shown in figure. 9



Tool No. - 04  
 Spindle RPM - 2500  
 Feed - 1600 mm/min  
 Depth of cut - 0.5 mm

All dimensions are in mm.

3. a) Explain the following features of CNC machine. 6
  - i) Tool Magazine
  - ii) Servo motor
  - iii) ATC

- b) State the functions of fixtures in CNC machine tool. Describe the various fixtures in CNC. 7
4. a) Explain the following tool pattern generation methods. 6  
i) PTP ii) Straight cut  
iii) Continuous path.
- b) What is part programming ? Compare and contrast manual part programming and computer assisted part programming. 7
5. a) What do you understand by Gating system ? Explain the elements of gating system in detail. 7
- b) What is riser ? Explain the design considerations of riser. 6

#### SECTION - B

6. a) Describe the common defects in forging and write its causes. 7
- b) How the Laser beam welding is different than ultrasonic welding with respect to : 6  
i) Principle of working.  
ii) Applications.
7. a) Explain the "Heat flow in welding". 6
- b) What are the causes of surface cracking and internal cracking in extrusion process ? 7
8. a) What are the effects of forging on grain structure and why is this beneficial to the properties of metal ? 7
- b) Explain the mechanics of 6  
i) Rolling ii) Drawing
9. a) Discuss the effect of pre heat and post heat treatment of weldability of material. 7
- b) What do you understand by "Extrusion Ratio" and explain the defect in extrusion. 6
10. a) Explain in brief : 7  
i) EBM Vacuum Chamber.  
ii) Production principle of laser beam.
- b) Write the significance of electrolysis process in accordance with metal removal in ECM. 7

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