

Seat  
No.

--	--	--	--	--	--



BBI1307

## Manufacturing Engineering - II (New) (1130)

P. Pages : 3

Time : Three Hours

Max. Marks : 100

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Solve **any two** subquestions from each unit.
5. Non programmable calculator is allowed.
6. Draw neat sketches wherever necessary.
7. Assume suitable data if necessary.

### UNIT - I

1. a) i) A tool life of 80 min. is obtained at a speed of 30 m/min and 8 min at 60 m/min. Determine the following. 5
- i) Tool life equation.
- ii) Cutting speed for 4 min tool life.
- ii) Determine the optimum cutting speed for an operation carried on a lathe machine using the following information. 5
- Tool change time = 4 min
- Tool regrind time = 3 min
- Machine running cost = 20 rupees per min.
- Depreciation of tool/regrind = Rs. 100
- The tool life equation is given by  $\sqrt{T}^{1/5} = 60$ .
- b) i) During turning a mild steel component with a 0 – 10 – 7 – 7 – 8 – 9 – 1.5 mm shaped orthogonal shaped tool a depth of cut 1.8 mm is used. If feed is 0.18 mm /rev and a chip thickness of 0.36 mm is obtained. Determine the shear angle. 5
- ii) Explain various forms of wear fund in cutting tool with neat sketch. 5

- c) Explain the Merchant's force circle in orthogonal cutting with assumption made while arriving at the final equations. 10

### UNIT - II

2. a) i) Explain the concept with example of redundant location. 5  
 ii) Why is foolproofing done in fixtures ? Give an example. 5  
 b) i) List any five points to be kept in mind to decide the clamping system in jigs and fixtures. 5  
 ii) Differentiate between jigs and fixtures. 5  
 c) Explain following jigs with neat sketch. 10  
 i) Box jig  
 ii) Plate jig.

### UNIT - III

3. a) A symmetrical cup of circular cross section with a 40 mm diameter and 60 mm height, having a corner radius of 2 mm is to be obtained in C20 steel of 0.6 mm thickness. Make the necessary design calculation for preparing the die for the above cup.  
 Permissible reduction in 1<sup>st</sup> draw = 40%, 2<sup>nd</sup> draw = 25% 3<sup>rd</sup> draw = 15% and 4<sup>th</sup> draw = 10%.  
 Trim allowance = 6 mm. 10  
 b) A 100 mm diameter hole is to be punched in a 6 mm thick steel plate. The material is cold rolled C-40 steel for which the maximum shear strength can be taken as 550 MPa. with normal clearance on the tools, the cutting is complete at 40% penetration of the punch. Give suitable diameters for the punch and die, and shear angle on the punch in order to bring the work within the capacity of a 200 kN press available in shop. Assume clearance per side = 0.45 mm. 10  
 c) Explain following types of dies with neat sketches. 10  
 i) Compound die.  
 ii) progressive die.

### UNIT - IV

4. a) Explain computer Numerical control machines with its advantages, limitations and applications. 10

- b) Differentiate between following. 10
- i) Open loop control system and close loop control system.
- ii) Point to point control and continuous path control.
- c) Describe various types of statements used in APT part programming with suitable examples. 10

### UNIT - V

5. a) Explain the principle, working of an EDM with neat sketch. List application of EDM. 10
- b) i) Explain the reasons why the unconventional machining processes are used. 5
- ii) What are the functions served by the electrolyte in ECM ? 5
- c) Write short notes on : 10
- i) Buffing.
- ii) Honing.

\*\*\*\*\*