

**B.Tech. – VIEP – MECHANICAL ENGINEERING
(BTMEVI)****Term-End Examination****December, 2015****BIME-014 : PRODUCTION TECHNOLOGY – II***Time : 3 hours**Maximum Marks : 70*

*Note : Attempt any **five** questions. All questions carry equal marks. Use of scientific calculator is permitted.*

1. (a) What do you mean by the term 'Taper' ?
Name the methods by which taper turning can be carried out on lathes. What are the advantages of using a taper turning attachment ?

(b) What do you mean by continuous and discontinuous chips ? List the conditions that are favourable for the formation of

(i) Continuous chips, and

(ii) Discontinuous chips.

7+7

2. (a) What are the main differences between a turret lathe and a capstan lathe ?

- (b) A work-piece of 250 mm diameter and 500 mm length is to be turned down to 235 mm diameter for the entire length. The recommended feed is 1 mm/revolution and the cutting speed is 135 m/min. The maximum allowable depth of cut is 5.0 mm.

Calculate :

- (i) Spindle rpm
- (ii) Feed speed
- (iii) Material removal rate
- (iv) Cutting time

7+7

3. (a) What factors are likely to give rise to excessive heat during a metal-cutting operation ?

- (b) Calculate the machining time required for machining a surface 600 mm × 800 mm on a shaping machine. Assume cutting speed as 8 m/min. The return-to-cutting time ratio is 1 : 4 and the feed is 2 mm/double-stroke. The clearance at each end is 70 mm.

7+7

4. (a) List down the factors on which the performance of a grinding wheel depends.
- (b) A hole of 25 mm diameter and 62.5 mm depth is to be drilled. The suggested feed is 1.25 mm/revolution and the cutting speed is 60 m/min. Assuming tool approach and tool overtravel as 5 mm, calculate the
- (i) Spindle rpm,
 - (ii) Feed speed,
 - (iii) Cutting time, and
 - (iv) Material removal rate. 7+7
5. (a) What is the fundamental difference between a planner and a shaper ?
- (b) Tool life testing on a lathe under dry condition gave n and C of Taylor's tool life equation as 0.12 and 130 m/min respectively. When a coolant was used, C increased by 10%. Find the percentage increase in tool life with the use of coolant at a cutting speed of 90 m/min. 7+7
6. (a) Discuss the advantages and disadvantages of CNC.
- (b) What are the applications of NC systems ? Also differentiate between NC and CNC. 7+7
7. (a) How are boring machines classified ? Discuss briefly, with a neat sketch, a horizontal boring machine.
- (b) Calculate the time taken to turn a brass component 60 mm diameter by 84 mm long, if the cutting speed is 50 m/min and the feed is 0.4 mm/revolution. Only one cut is to be considered. Neglect tool approach and tool travel. 7+7

8. (a) How are milling machines broadly classified ? Name the various operations which can be performed on a milling machine.
- (b) Write short notes on any *two* of the following :
- (i) NC Part Programming
 - (ii) APT Programming
 - (iii) Universal Chuck
 - (iv) Centreless Grinding Machine
 - (v) Adaptive Control System
- 7+7
-