

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V • EXAMINATION – SUMMER 2013****Subject Code: 152002****Date: 16-05-2013****Subject Name: Manufacturing Technology-I****Time: 10:30 pm to 01:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** (1) List the factors affecting speed and feed **07**
 (2) Give purpose of cutting fluids
 (3) Define rake angle and relief angle for single point cutting tool
- (b)** (1) State advantages and disadvantages of 3 jaw and 4 jaw chuck. **03**
 (2) Give differences between engine lathe and Capstan/Turret lathe. **04**
- Q.2 (a)** (1) Explain different taper turning methods used on Engine lathe. **05**
 (2) Determine the end gear train required to cut a 3.5 mm pitch single start thread on a lathe with a 6 mm pitch lead screw. The change gear set available with the machine has gears from 20 teeth to 100 teeth in steps of 5 teeth. **02**
- (b)** (1) Explain any four specification of a lathe machine briefly. **04**
 (2) A lathe with a 6 mm pitch single start right hand lead is to be set to cut 8 threads per inch. Determine the end gear train to be set up if the lathe is supplied with a change gear set 24 to 76 teeth and a 63 teeth wheel. **03**
- OR**
- (b)** Give different lathe operations and explain any three with neat sketch. **07**
- Q.3 (a)** (1) Explain operation of Radial drilling machine with neat sketch. **03**
 (2) A 20 mm diameter hole is to be drilled in a 30 mm thick mild steel plate at a speed of 0.5 m/s and feed rate of 0.15 mm/rev. The point angle of drill is 118° and approach and over travel may be assumed to be 6 mm. Calculate: **04**
 (i) Time required for the cut.
 (ii) Torque. $[T = C_2 d^{1.9} f^{0.8} \text{ N.mm}, C_2 = 615]$
 (iii) Power required if the efficiency of transmission is 80%
- (b)** Illustrate the following operations performed on a drilling machine with neat sketch. (i) Drilling (ii) Tapping (iii) Spot facing (iv) Counter boring. **07**
- OR**
- Q.3 (a)** Explain following fits. **07**
 (i) Clearance fit (ii) Interference fit (iii) Transition fit.
- (b)** (1) Differentiate between Tolerance and Allowance **03**
 (2) Explain Hole basis and Shaft basis system **04**
- Q.4 (a)** (1) Explain any two milling cutters with neat sketch. **04**
 (2) Differentiate up milling and down milling on horizontal milling machine. **03**
- (b)** (1) Explain differential indexing. **03**
 (2) Explain different work holding devices available on milling machine. **04**
- OR**
- Q.4 (a)** Describe column and knee type Milling machine with the help of neat sketch. **07**
- (b)** (1) Give differences between gang milling and string milling operation **03**
 (2) Two 80 mm wide x 180 mm long surfaces of cast iron block are to be slab milled with a H. S. S. helical milling cutter 100 mm diameter 125 mm long having 12 teeth. A depth of cut of 8 mm is to be taken with a cutting speed of 0.5 m/s and a feed rate of 0.06 mm/tooth. What is the machining time and metal **04**

removal rate? Also calculate the power required for cutting if unit power for operation is 2.7 J/mm and efficiency of transmission is 80%.

- Q.5 (a)** (1) Draw the tooth set of saw and write application of each. **03**
(2) Give differences between Shaper and Planer. **04**
- (b)** (1) Briefly explain lapping and honing operations for finishing external surfaces. **03**
(2) What is a broaching operation? Explain the elements of Broaching machine. **04**
- OR**
- Q.5 (a)** (1) A silicon carbide wheel is used to grind C. I. whereas aluminum oxide wheel is used to grind mild steel material-Evaluate. **03**
(2) Explain centre less grinding machine operation. **04**
- (b)** (1) List the factors which influence grinding wheel bond selection. **05**
(2) In centre less grinding why is it necessary to support the work piece above the centre line of grinding wheel and regulating wheel. **02**
