

GUJARAT TECHNOLOGICAL UNIVERSITY
B. E. - SEMESTER – III • EXAMINATION – WINTER 2012

Subject code: 131903**Date: 03-01-2013****Subject Name: Manufacturing Process- I****Time: 10.30 am – 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) i) Draw front view, top view and side view of single point cutting tool. Indicate all elements and important angles on it. Identify following tool signature 8-14-6-6-20-15-4. **03**
- ii) In a turning operation, the following tool life was given **04**
$$VT^{0.12} X f^{0.7} X d^{0.3} = C$$

At a cutting speed = 25 m/min, feed = 0.3 mm/rev and depth of cut = 3 mm, the tool life was one hour. Calculate the tool life if the cutting speed, feed and depth of cut are increased by 25 % individually.
- (b) Define machining process. Give details classification of machining processes. State the factors influencing the selection of the suitable process. **07**
- Q.2** (a) Explain in details various types of lathe. **07**
- (b) What are the main difference between a turret lathe and a capstan lathe. **07**
- OR**
- (b) Draw a neat sketch of thread cutting set up on centre lathe and indicate all elements on it. Calculate the change gears to cut right hand threads of 1.25 mm pitch on MS round bar of 20 mm diameter. The lathe has 4 threads per inch. The gears available from 20 to 120 teeth in step of 10 teeth and also 127 teeth gear available. **07**
- Q.3** (a) Name the various alignment tests which are conducted on lathe. Explain with the help of neat sketch following alignment test on lathe i) leveling of the machine ii) parallelism of spindle axis and bed. **07**
- (b) Explain with neat sketch crank and slotted link quick return mechanism in shaper. Also draw velocity diagram. **07**
- OR**
- Q.3** (a) Explain with neat sketch quick return motion in the hydraulic shaper. What are the advantages and disadvantages of hydraulically driven shaper. **07**
- (b) Draw a neat sketch with label of following operation and indicate direction of cutting parameters on it. i) Reaming ii) boring iii) Counter boring iv) Countersinking v) Spot facing vi) Tapping vii) Trepanning. **07**
- Q.4** (a) Draw a neat sketch with label of following operation and indicate direction of cutting parameters on it. i) Plain or slab milling ii) Face milling iii) Angular milling iv) Form milling v) Straddle milling vi) Gang milling vii) End milling **07**
- (b) i) A slot of 30mm X 30mm is to be milled in a workpiece of 300 mm length using a side and face milling cutter of diameter 100 mm, width 30 mm and **03**

having teeth 20. Taking depth of cut 5 mm, feed per tooth 0.1mm, cutting speed 35 m/min and overtravel distance of 5 mm. Calculate time required for milling the slot.

ii) Sketch & Compare Up milling and Down milling. **04**

OR

Q.4 (a) State the marking system for grinding wheels recommended by Bureau of Indian Standards (IS: 551-1989). **07**

Identify grinding wheel. 220 X 25 X 30 W A 40 L 4 V 18

(b) i) Explain the following terms. **04**

i) Glazing ii) Loading iii) Dressing iv) Truing.

ii) Name & draw neat sketch of various grinding wheel, also write its application. **03**

Q.5 (a) Define broaching. Write advantages, limitation & applications. **07**

(b) Define Sawing. Write advantages, limitation & applications. **07**

OR

Q.5 (a) i) Compare multispindle drilling machine and Gang drilling machine. **04**

ii) A taper pin of length 100 mm has a taper length 50 mm. The bigger diameter of taper is 30 mm & smaller diameter is 20 mm. Determine i) taper in mm/ min. ii) The angle to which the compound rest should be swiveled. iii) Tail stock set over. **03**

(b) Explain with neat sketch Jig boring machine and write its application. **07**

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