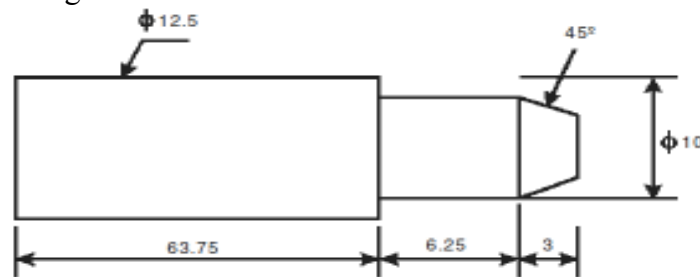


GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-III Examination-Dec.-2011

Subject code: 133404**Date: 20/12/2011****Subject Name: Basic Manufacturing Processes****Time: 2.30 pm -5.00 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) Draw a neat sketch of engine lathe and mention its parts. **04**
 (b) What are the different operations performed on a lathe machine? **03**
 (c) A MS shaft is to be turned out of a 15 mm dia. and 75 mm long MS bar as shown in figure. **07**
 as shown in figure.



Determine the machining time for the following operations to be done on the shaft:

- (i) Facing 15 mm dia. (both ends).
- (ii) Turning to 12.5 mm dia.
- (iii) Turning to 10 mm dia., a portion of the length 9.25 mm.
- (iv) Chamfering on the 10 mm dia. end $3 \text{ mm} \times 45^\circ$.

Cutting speed shall be 30 m/min, Feed for facing 0.125 mm/rev; for turning 0.35 mm/rev; for chamfering 0.25 mm/rev and Depth of cut for all shall be 1.25 mm.

- Q.2** (a) Explain the working principle of shaper with neat block diagram and describe the functions of its main parts. **07**
 (b) What are the different quick return mechanisms in a shaper? Explain crank and slotted link mechanism. **07**

OR

- (b) Find the time required on a shaper to machine a $1200 \times 600 \text{ mm}$ plate, if the cutting speed is 15 m/min. The ratio of return stroke time to cutting time is 2:3. The clearance at each end is 25 mm along the length and 15 mm on width. Find cuts are required, one roughing cut with cross feed of 2 mm per stroke and one finishing cut with feed of 1 mm/stroke. **07**

- Q.3** (a) How do you classify drilling machines? Explain Radial arm drilling machine with neat sketch. **07**
 (b) Find the time required to drill 4 holes in a cast iron flange each of 2 cm depth, if the hole diameter is 2 cm. Assume cutting speed as 21.9 m/min. and feed as 0.02 cm/rev. **07**

OR

- Q.3 (a)** Explain the geometry and nomenclature of twist drill. **07**
- (b)** Explain the various operations performed on drilling machine with neat sketches. **07**
- Q.4 (a)** Write short notes on the following. (i) Up milling (ii) Down milling (iii) Milling Attachments (iv) Differential Indexing **07**
- (b)** What are the types of milling machine? Explain Vertical column and knee type milling machine with neat sketch. **07**
- OR**
- Q.4 (a)** Explain different types of milling cutters with neat sketches. **07**
- Q.4 (b)** What is the feed per tooth of a 32 tooth milling cutter of 37.5 cm diameter having a spindle speed of 75 rpm and the table feed of 28.75 cm/min? Also find the time to face mill a C.I. Casting 1.2 m long and 26.66 cm wide. **07**
- Q.5 (a)** Explain in detail the standard marking system of grinding wheels. **07**
- (b)** Explain the following. **07**
- (i) Wheel balancing (ii) Truing (iii) Loading (iv) Dressing
- OR**
- Q.5 (a)** Explain the types of grinding wheels with neat sketches. **07**
- (b)** Find the time required for rough grinding of a 16 cm sling step 1 shaft to reduce its diameter from 4.2 to 4 cm in a grinding wheel of 2 cm face width. Assume cutting speed as 16.5 m/min and depth of cut as 0.25mm. **07**
