Roll No. _____   Total No. of Pages : 4

6E3051

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B.Tech VI Sem. Main/Back Exam. April- May 2012
Mechanical Engg.
6ME3 Manufacturing Science & Technology

Time : 3 Hours   **Maximum Marks : 80**
                                   Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five questions**, selecting one question from **each unit**.*
*All Question carry **equal** marks. Schematic diagrams must be shown*
wherever necessary. Any data you feel missing suitably be assumed
and stated clearly.

Units of quantities used/ calculated must be stated clerly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)
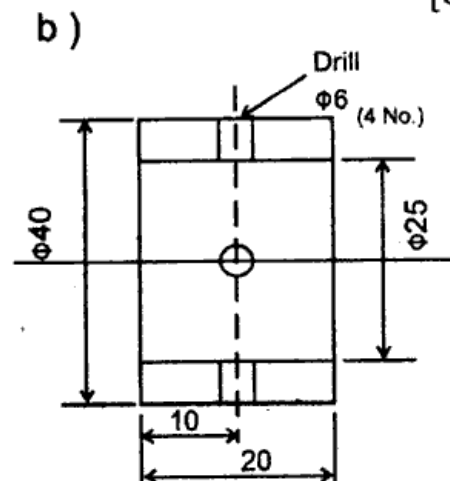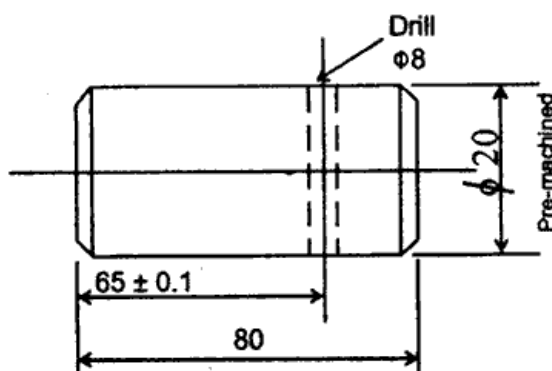
1. _____Nil_____   2. _____Nil_____

Unit-I

1. (a) Discuss various principles of clamping and explain any two clamping elements with neat sketch.   8

   (b) Explain various parts of a milling fixture with neat sketch. What is purpose of a setting block.   8

                                   Or

1. Design and draw drill jigs for doing drill jigs for doing drill in the components shown in figures shown below.   [8+8]

a)   b)

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Unit-II

2. (a) Classify newer machining methods on the basic of energy used in machining. What is the advantages and limitations of these methods compared to conventional machining.   6

   (b) Explain electric discharge machining (EDM) process with neat sketch. Discuss its advantages, limitations and application. What do you mean by wide cut EDM?   10

Or

2. (a) Discuss ultra sonic machining (USM) process with neat sketch. Discuss the effect of frequency, amplitude, grain size, viscosity on the M.R.R.   8

   (b) Explain following processes

   (i) Plasma arc machining   5

   (ii) Hot machining   3

Unit-III

3. (a) Explain two wire method of effective diameter measurement of screw threads. Derive the formula for effective dies. What do you mean by "Best –size" wire?   8

   (b) Explain with neat sketch

   (i) Gear tooth vernier caliper & its use

   (ii) Parkinson gear tester.   8

Or

3. (a) Sketch and explain any one instrument used for measurement of surface roughness.   8

   (b) Differentiate between a comparator and a measuring instrument. Explain the working principle and applications of a pneumatic comparator.   8

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Unit-IV

4. (a) Sketch a single point wetting tool showing all angles. What is the function of different angles? What is the optimum value of different angles while machining M.S. with H.S.S. tool? **8**

(b) A 6^0 back rake solid lathe tool is to be employed for the machining of steel at 50 m/min, feed 0.05 mm/rev. and at a depth of 2.0 mm. The maximum permissible deflection at the tool point is 0.01 mm and the maximum allowable stress in the tool shank is 6 kg/mm². Find the cross section of a rectangular tool shank. rtuonline.com

The cutting force can be obtained from the formula

$F_c = 256x\ f^{0.15}xd$ (kg) and the work dia is 150mm.

Assume a rectanglan shank with H/B = 1.6 and tool overhang l = 1.25 H. Assume E = $20x10^3$ kg/mm² **8**

Or

4. (a) Explain different elements of a "plain milling cutter" with neat sketch. Discuss the functions of relief angle and rake angle. **8**

(b) Disuses design of a milling cutter an following points :

(i) Size of cutter (ii) Tool angles

(iii) Number of teeth (iv) Flutes, and

(v) Material of cutter **8**

Unit-V

5 (a) Discuss the materials and construction feature of lathe bed. **8**

(b) Discuss various stiffener arrangements for improving the stiffeness of lathe bed. **8**

Or

(a) Explain different types of guide ways with neat ketches. Discuss about their materials also.   8

(b) Explain Antifriction guide ways with neat sketch. What are their applicatios?   8