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)
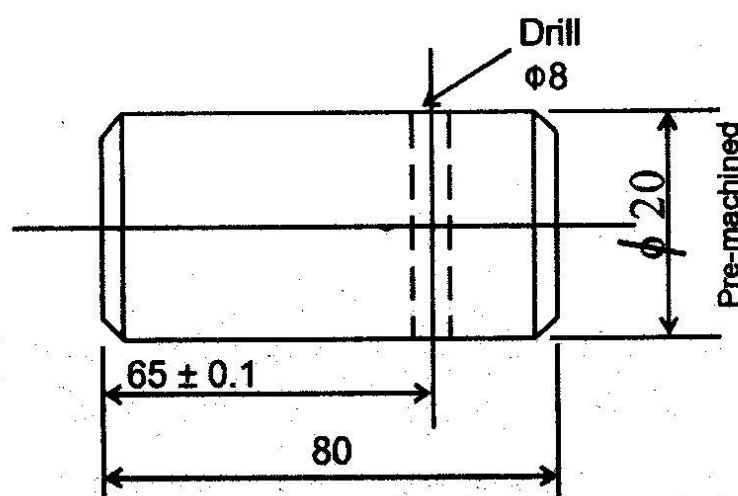
1._____Nil_____   2. _____Nil_____

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
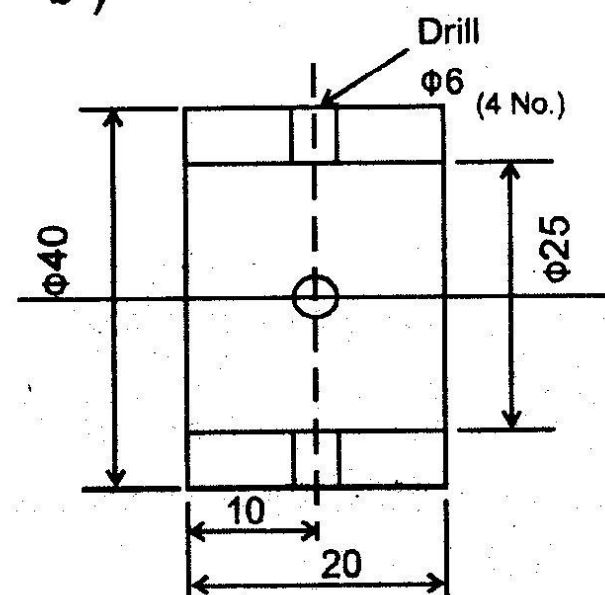
Or

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)

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, viscosify 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**

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 $6°$ 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.

The cutting force can be obtained from the formula

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

Assume a rectanglan shank with H/B = 1.6 and tool overhang l = 1.25 H. Assume $E = 20 \times 10^3$ 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