Total No. of Questions : 8] [Total No. of Printed Pages : 4

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AU/IP/IM/ME–305(N)

B. E. (Third Semester) EXAMINATION, Dec., 2010

(New Scheme)

(Common for AU, IP/IM & ME Engg. Branch)

MACHINE DRAWING AND DESIGN

Time : Four Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt *four* questions selecting *one* question from each Unit. Assume suitable missing/misprint data, if any.

Unit–I

1. (a) List the general principles of dimensioning. 8

   (b) Draw the full sectional veiw and top view of the block given in fig. 1. 12

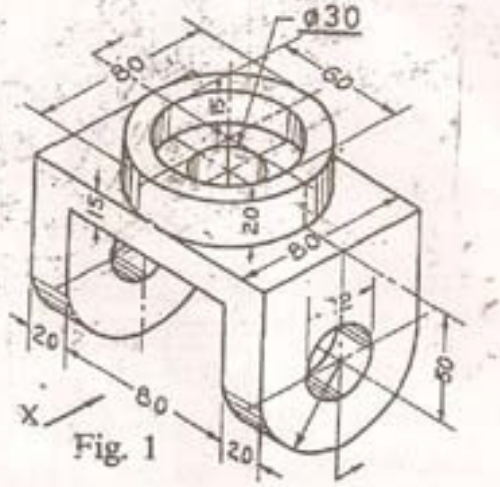

Fig. 1

P. T. O.

Or

2. (a) What is conventional respresentation ? Draw the conventional representation of the following : 10

   (i) External thread (ii) Bearing

   (iii) Splined shaft (iv) Filled weld

   (b) Sketch neatly a sectional front view and top view of a single riveted butt joint for two 10 mm thick plates using two butt-straps. Show all dimensions on your drawing. 10

Unit–II

3. Details of a tool post is given in fig. 2. Assemble the components in proper sequence and draw :

   (a) Full selectional front view 25

   (b) Top view 10

   (c) Bill of material 5

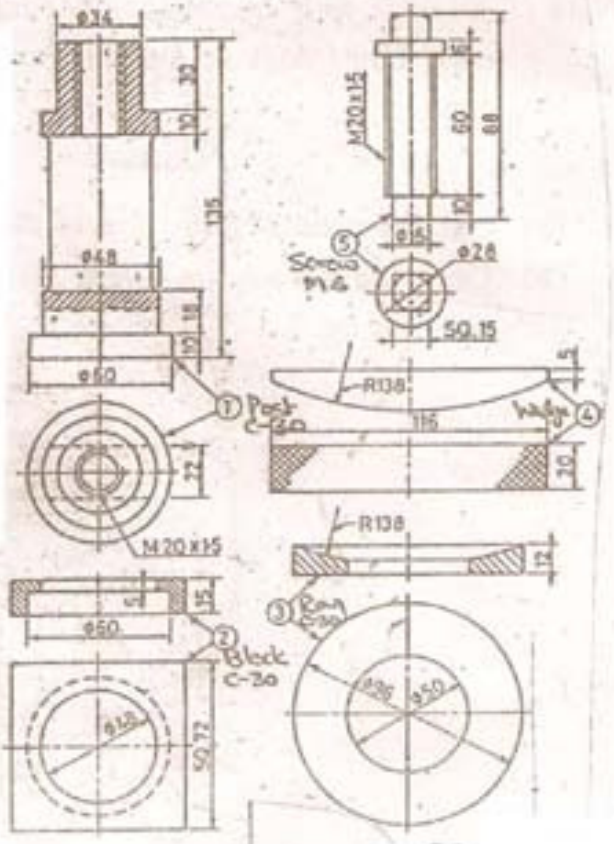

Fig. 2

Or

4. Assemble the parts of a knuckle joint shown in fig. 3 and draw :
   (a) Sectional front view 25
   (b) Top view 10
   (c) Bill of material 05

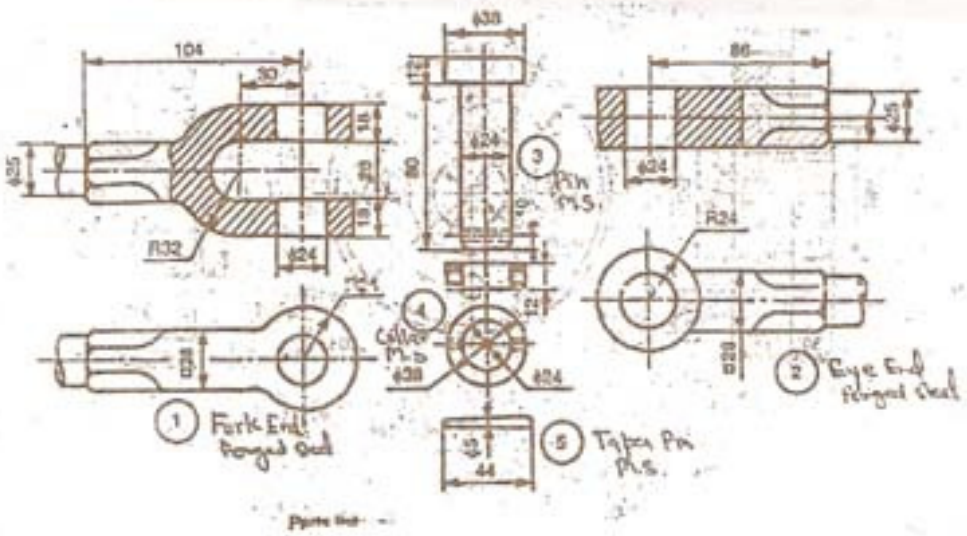

Fig. 3

Unit–III

5. (a) What is Design ? Explain the basic procedure of designing with the help of flowchart. 10
   (b) Explain various design considerations in brief while designing a machine. 10

Or

6. (a) What is factor of safety ? Explain the various factors that influence the magnitude of factor of safety. 10
   (b) For a transition fit H7/n6, calculate the extreme diameters of shaft and hole if the nominal diameter is 12 mm. Calculate also the largest clearance. 10

Unit—IV

7. (a) What are different modes of failure of a rivet joint ? What is efficiency of a riveted joint ? 6

   (b) Design longitudinal joint for a boiler whose inner dia. is 1675 mm and steam pressure is 2 N/mm^2. The joint is to be triple riveted butt joint. The pitch in the outer row is to be twice that in the inner rows and only inner cover plate covers the outer rows. The permissible stresses are : 14

   $\sigma_t = 90$ MPa

   $\sigma_c = 150$ MPa

   $\tau_s = 75$ MPa

Or

8. (a) Derive strength equation of a longitudinal fillet weld joint. 6

   (b) The structural connection shown in the following fig. is subjected to an eccentric face P of 10 kN with an eccentricity of 500 mm. The centre distance between bolts 1 and 3 is 150 mm and between 1 and 2 is 200 mm. All the bolts and identical. The bolts are made from plain carbon steel 30C 8 (S_{yt} = 400 N/mm^2) and factor of safety is 2·5. Determine the size of the bolts. 14

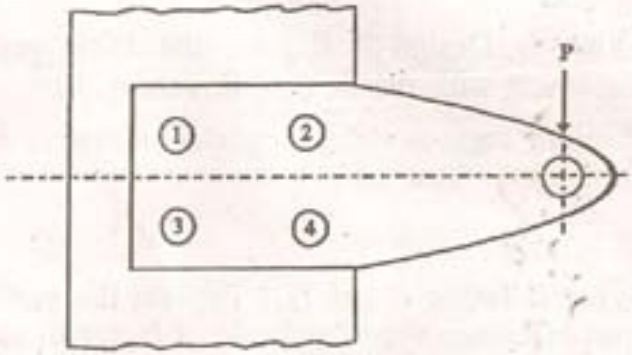

Fig. 4