Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-II Remedial Examination December 2010

Subject code: 720902

Subject Name: Geometrical dimensioning and Tolerancing

Date:20 /12 /2010 **Time: 02.30 pm – 05.00 pm**

Total Marks: 60

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** With the help of a suitable example specify the details to be provided in a geometrically dimensioned and tolerance drawing. Also prove that cylindrical tolerance zone is 57% more than that of square tolerance zone **06**

(b) For the mating features shown in **figure 1**, calculate the worst assembly condition. **06**

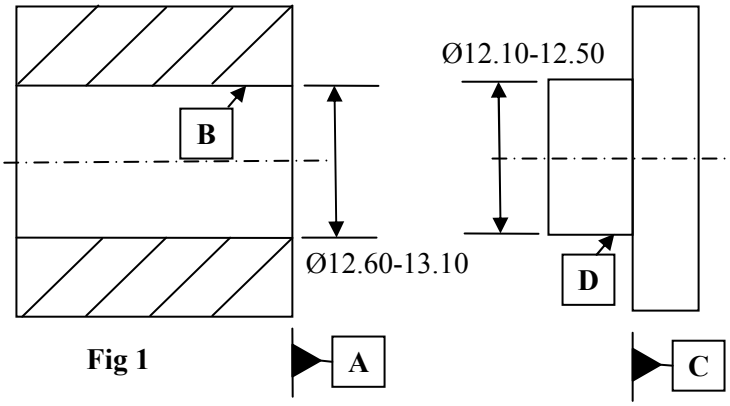


Fig 1

If the drawing is modified as shown in **figure 2** will the assembly is possible? How much is the maximum bonus tolerance and the total geometric tolerance of feature's B & D

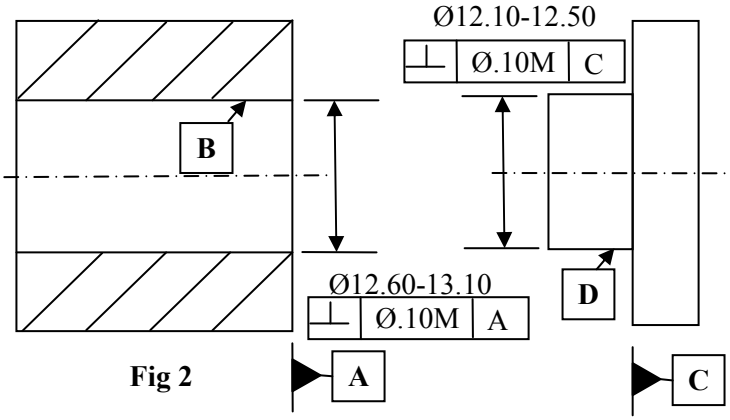


Fig 2

Q.2 **(a)** With the help of a suitable example bring out the concept of RFS. Also cite two examples wherein the functional requirements demands RFS **06**

(b) Fill in the rest of the feature control frame, given in **figure 3**, to assure that it will mate with the shaft. Calculate the worst mating boundary of the shaft

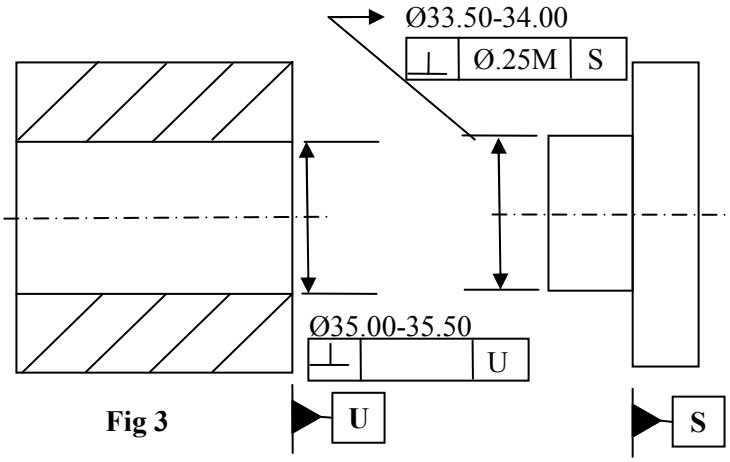


Fig 3 **06**

OR

(b) Fill in the rest of the feature control frame, given in **figure 4**, to assure that it will mate with the shaft. Calculate the virtual size of the bore **06**

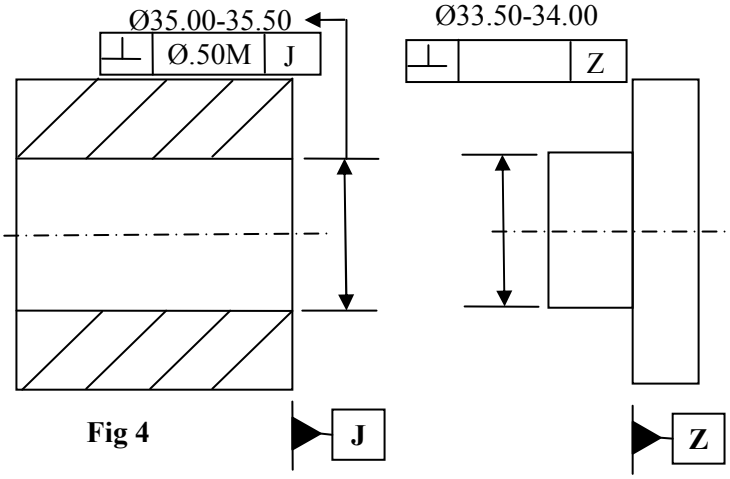


Fig 4

Q.3 **(a)** With the help of suitable examples interpret the following form controls (i) straightness (ii) flatness **06**

(b) Find the positional error of each hole, given in figure 5, (1) at MMC (2) LMC **06**

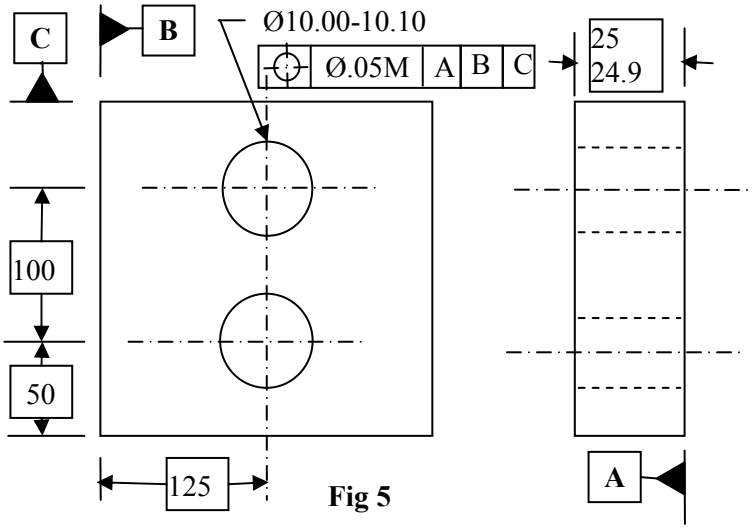


Fig 5

OR

Q.3 **(a)** With the help of suitable examples interpret the following orientation controls (i) angularity (ii) perpendicularity **06**

(b) Design the mating part that can be assembled with the component given in **figure 5** **06**

Q.4 **(a)** With the help of neat sketches explain how simulated datum reference frame is used to eliminate all 6 dof of a rectangular part **06**

(b) Convert the drawing given in **figure 6** to true position tolerancing **06**

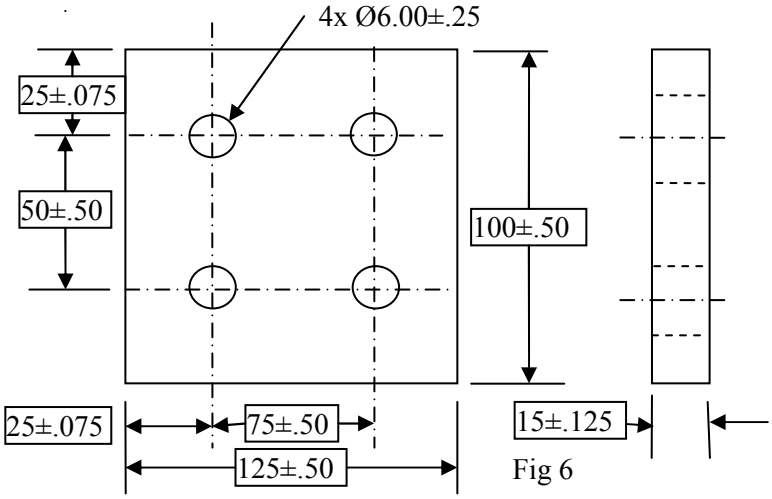


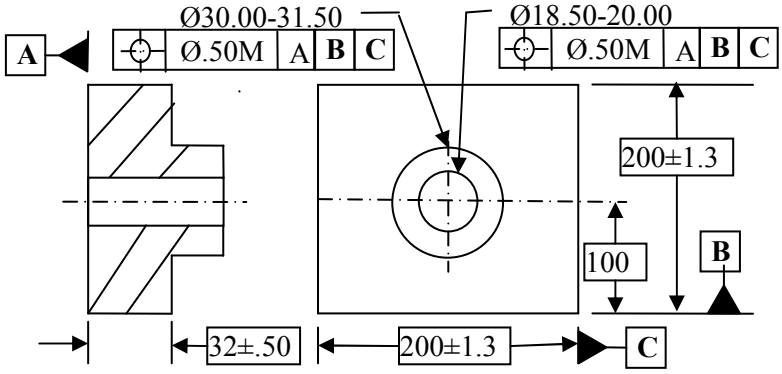
Fig 6

OR

Q.4 **(a)** How do you specify datum targets? Explain the meaning and significance of datum targets **06**

(b) Schematically differentiate between (a) datum feature (b) datum feature simulator and (c) datum plane. Also explain how do you check whether the simulated primary datum plane is a valid one or not **06**

Q.5 **(a)** Calculate the minimum wall thickness of the component given in **figure 7** **06**



(b) With the help of suitable examples interpret the following orientation controls (i) circularity (ii) cylindricity **06**

OR

Q.5 **(a)** With the help of suitable examples interpret the following orientation controls (i) parallelism (ii) coplanarity **06**

(b) With the help of suitable example explain how to calculate the tolerance in a floating fastener assembly and the meaning of projected tolerance zone **06**

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