Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER II (OLD) – • EXAMINATION – SUMMER 2016

Subject Code: 1720902 **Date:18/05/2016**

Subject Name: Geometrical Dimensioning and Tolerancing

Time:10:30 am to 01:00 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)** "Feature control frame is the core of GD&T", evaluate this statement giving suitable example **07**

(b) Convert the drawing given in figure 1 from plus and minus to true position tolerancing. Also dimension the mating part containing the bore using the datums, base dimensions and position tolerance so it is compatible with the first part. Also specify the advantages of true position tolerancing over plus and minus tolerances. **07**

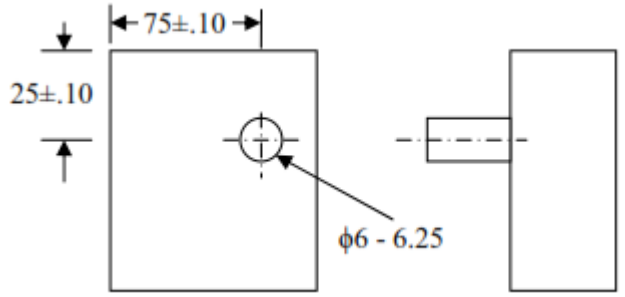

Fig 1

Q.2 **(a)** Giving suitable examples, explain how datum's are simulated? **07**
Are three datum's always necessary for part orientation? If yes, why? If no, why not?

(b) With the help of suitable examples explain (i) compound datum for co-planarity and co-axiality (ii) two co-axial diameters to construct a datum axis (iii) Datum target area. **07**

OR

(b) With the help of neat sketches explain how 3-2-1 location concept is applied to a cube to restrict the unwanted degrees of freedom. **07**

Q.3 **(a)** With the help of suitable example, bring out the advantage of zero positional tolerance compared to a specified positional tolerance . **07**

(b) **07**

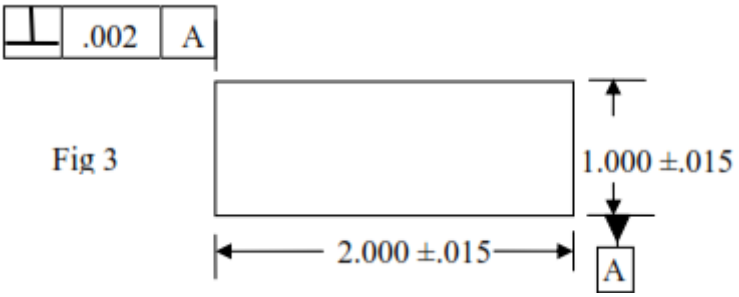

Fig 3

Sketch and label the shape and size of the tolearance zone formed by the perpendicularity control. Is the tolerance of perpendicularity additive to the part MMC or must it be contained within the part MMC? Justify your answer. In this control the perpendicularity tolerance of .005 is smaller than the part size tolerance of ±.015. Could the perpendicularity tolerance have been equal to or larger than the part size tolerance? Why or why not? Without the feature control frame what would be the maximum permissible perpendicularity error.

OR

Q.3 **(a)** Name various run outs and explain them, giving suitable examples. Why material condition symbols are not used with run outs? Do you need to specify datum(s) with run outs? Justify your answer giving suitable examples. **07**

(b) The resultant and virtual condition boundaries are of great significance under various functional conditions of mating components" evaluate this statement giving suitable examples. **07**

Q.4 **(a)** With the help of a suitable example explain what you mean by datum feature of size. How does it influence the feature under consideration, when used as secondary datum? **07**

(b) Giving suitable examples, explain the term "Simulating a datum feature. Why it is required? **07**

OR

Q.4 **(a)** Differentiate between circularity and cylindricity. Sketch the shape of the tolerance zone. Can cylindricity and circularity be applied to the same surface? If so, which tolerance must be smaller and why? If not, why not? **07**

(b) Giving suitable examples, explain the term "Simulating a datum feature. Why it is required? **07**

Q.5 **(a)** Explain with neat sketches the concept of projected tolerance zone & floating fasteners. **07**

(b) Explain functional gauge design taking suitable example **07**

OR

Q.5 **(a)** "Mating components need to be tolerance logically to meet the functional requirements" evaluate this statement giving suitable example **07**

(b) "Mating components need to be tolerance logically to meet the functional requirements" evaluate this statement giving suitable example **07**

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