Answer All Questions

Question One :

a) Define The Following Items:- Hole Basis System-Shaft Basis System-Unilateral Tolerance- Bilateral Tolerance-The Different Types Of Engineering Tolerances--

b)What is the drawing symbols for the following tolerances:- Flatness;Roundness;Parallelism;Position; Radial run-out

c)Define the following terms:-Tolerance zone;   Max. metal condition;   Min. metal condition; Fundamental deviation.   Upper deviation.   Lower deviation.

Question Two:-

a)Distinguish between a measuring instruments and limit gauges and explain why a GO gauge should be of a full form and NOT GO gauge should check only one dimension.

b)Explain the ISO system for size tolerances(individual and general tolerances).

c)Design the general type GOand NOT GO gauges for component having 50 H7/d8 fit.Being given with usual notation:-

$i = 0.45 \sqrt[3]{D} + 0.001D$

the upper deviation for shaft =- $16D^{0.44}$

50 mm falls in diameter step of 30 and 50 mm.Also determine the following:-Taype of

Of fit (takeIT7=16i and IT8=25i)

Question Three:-

a)Describe with aid of sketches two methods of testing the straightness of one meter steel straight edge. State the advantages of each method and the possible sources of error.

b)The departure from straightness of a straight edge 1.0 meter was tested by dial gauge.The straight edge was supported at the points for minimum deflection and the readings(in div.) were:-

    .0 *   +2*   +4*   -3*   +6 *   +5 *   -4 *   +2 *   +5 *   +6 *   +10 . Plot the graph to show errors from straight line through the points of support.

c)Explain how the flatness of a surface plate,approximately 1000x700 mm. in size,may be tested by means of a spirit level.

Question Four:-

a)The following elements of screw thread are to measured:

  * The outer diameter.

  *The effective diameter.

  *The core diameter ,

Explain the methods with sketches,whenever possible,you propose for the measurements.

b)In measuring the effective diameter of a 30M2 mm pitch metric plug screw gauge ,the average of the readings taken were(using three wire method) :-

    *Micrometer reading over standard cylinder =5.3652 mm.

  *Micrometer reading over plug screw gauge =4.3652 mm

  *Diameter of standard cylinder.   =32 mm.

  *Diameter of wires.   =1.3592 mm.

     Calculate the best size wire and the effective diameter.

c)Show by diagrammatic sketches and brief description how you would perform the following alignment tests :-

  *Tests for spindle concentricity and alignment with guide-ways (for lathe)

  * Test for axial slip of the lathe spindle.

  *Test for squarness of drilling machine spindle with the table.

With my best wishes