16117

3 Hours / 100 Marks   Seat No.

Instructions : (1)   All Questions are *compulsory*.

(2)   Illustrate your answers with neat sketches wherever necessary.

(3)   Figures to the right indicate full marks.

(4)   Assume suitable data, if necessary.

(5)   Use of Non-programmable Electronic Pocket Calculator is permissible.

(6)   Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

(7)   Preferable, write the answers in sequencially order.

Marks

1.   (A)   Attempt any THREE of the following :   **12**

(a)   Define 'Metrology' & state the necessity of metrology.

(b)   Differentiate between hole basis system & shaft basis system.

(c)   Explain why sine bar is not used for measurement of angle greater than 45°, if accuracy in angle measurement is required.

(d)   Define process capability & state how it is achieved.

(B)   Attempt any ONE of the following :   **6**

(a)   Name the comparator which has highest magnification. Explain its working & state its advantages & disadvantages.

(b)   Write the procedure for measuring 'effective diameter of screw thread' using two wire method.

2.   **Attempt any FOUR of the following :** 16

(a)   Explain the various sources of errors in measurements.

(b)   Differentiate between unilateral system & bilateral system of tolerances on any four parameter.

(c)   What is clinometer ? Explain its use with suitable figure.

(d)   Explain 'Parkinson's gear tester' with neat sketch.

(e)   Why 100% inspection is generally not preferred in the industry for mass production ?

3.   **Attempt any FOUR of the following :** 16

(a)   Discuss the characteristics of line standard & end standards.

(b)   An angle of 139°30′27″ is to be developed using angle gauge set of

(1°, 3°, 9°, 27°, 41°)

(1′, 3′, 9′, 27′)

(3″, 6″, 18″, 30″) & a square block.

Show the arrangement with neat sketch.

(c)   What is statistical quality control ? State the benefits of SQC.

(d)   List the types of errors in threads & explain.

(e)   Define the terms.

(i)   CLA

(ii)   Ra

(iii) RMS

(iv)   Rz

4.   (A)   **Attempt any THREE of the following :** 12

(a)   Draw the sketch & write the procedure for squareness testing of drilling machine spindle with table.

(b)   State different SQC tools & explain any one.

(c)   Interpret the meaning of $25H_8S_6$ with respect to fit & basis of system.

(d)   Explain 'cost of quality' & 'value of quality'.

(B) Attempt any ONE of the following : **6**

    (a) Explain the advantages & limitations of ISO 9000.

    (b) Define 'control charts' & give its classification. Explain stepwise procedure of plotting $\bar{X}$ chart.

5. Attempt any TWO of the following : **16**

(a) Explain the construction & working of sigma comparator with neat sketch.

(b) Explain in detail errors in gears.

(c) Following are the inspection results of soldered PCB boards for 6 days. Draw proper control chart & conclude.

Day	1	2	3	4	5	6
No. of PCB checked	20	25	22	20	25	24
Defects found	4	3	2	3	4	2

6. Attempt any TWO of the following : **16**

(a) What is meant by O.C. curve ? Draw ideal & actual O.C. curve & Explain.

    (i) Producer's risk.

    (ii) Consumer risk.

(b) Explain quality of conformance & quality of performance & state factors affecting quality of product.

(c) Explain the terms.

    (i) Primary texture

    (ii) Secondary texture

    (iii) Sampling length

    (iv) Lay

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