17530

15162

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.*

Marks

1. A) Attempt **any three**: **(4×3=12)**

a) Define metrology. State the types.
b) State the Taylor's principle of gauge design.
c) Differentiate between 'angle gauges' and 'slip gauges'. (four points)
d) What is S.Q.C. ? State the benefits.

B) Attempt **any one** : **(6×1=6)**

a) Write the procedure for measuring 'Effective diameter' of screw thread, by using 'two-wire method'.
b) Differentiate 'line standard', 'end standard' and 'wave length standard'. (Give one application of each of them).

2. Attempt **any four**: **(4×4=16)**

a) Draw a labelled diagram showing the working mechanism of a dial indicator.
b) What is 'Interchangeability' ? State its need and relevance in mass-production industries.
c) Draw a labelled diagram of a universal bevel-protractor show its specific application on diagram.
d) Name the types of pitch errors. Sketch and label each type.
e) Distinguish between the terms "Producer's risk" and "Consumer's risk".

3. Attempt **any four**: **(4×4=16)**

a) Define the term 'comparator'. State the characteristics of a good comparator.
b) An angle of 117° 8′ 42″ is to be set and measured with the help of standard angle gauges and square block. Select the minimum number of pieces and sketch the arrangement.
c) Differentiate between 'Variable Chart' and 'Attribute chart' (four points).
d) State the principles of TQM.
e) Explain the principle of measurement of Parkinson gear tester with a neat sketch.

P.T.O.

Marks

4. A) Attempt **any three**: **(4×3=12)**

a) Distinguish between 'Alignment test' and 'Performance test' of a machine tool.

b) By using optical flat and monochromatic light source, explain how will you determine whether the given surface is convex or concave or flat.

c) Design a general type plug gauge for checking a hole dimension $30^{+0.05}_{-0.03}$. Consider both wear allowance and gauge tolerance as 10% of work tolerance.

d) Explain 'Cost of Quality' and 'Value of Quality' with the help of graph.

B) Attempt **any one**: **(6×1=6)**

a) Compare single and double sampling plans.

b) State the characteristics and applications of normal distribution curve.

5. Attempt **any two**: **(8×2=16)**

a) With a neat sketch explain the principle of working of LVDT. State its applications.

b) Explain the principle of measurement of a spur gear tooth thickness using a gear tooth vernier. State mathematical relations to compute chordal addendum and chordal tooth thickness.

c) Draw a neat labelled sketch of O.C. curve. State the procedural steps of construction of O.C. curve.

6. Attempt **any two**: **(8×2=16)**

a) i) Distinguish between 'Primary texture' and 'Secondary texture'.

ii) Define CLA and RMS values as applied to surface roughness measurement.

b) i) State the meaning of 'Quality of Design' and 'Quality of Conformance'.

ii) State the importance of 'Quality audit'.

c) Following are the inspection results of magnets for five observations. Draw appropriate control chart and conclude.

Week No.	1	2	3	4	5
No. of magnets inspected	728	724	720	730	724
Defectives found	48	83	80	58	60