

- Instructions :**
- (1) All questions are compulsory.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.

1. (a) Attempt any **THREE** of the following: [12]
- (i) Define line standard and end standard. Give one application of each.
 - (ii) State the Taylor's principle of gauge design.
 - (iii) Differentiate between 'angle gauges' and 'slip gauges'. (four points)
 - (iv) If length of sine bar is 100 mm, find the length of slip gauges required to build an angle of 14° by using M45 slip gauge set.
- (b) Attempt any **ONE** of the following: [6]
- (i) Write a procedure for measuring of 'Effective diameter' of screw thread, by using 'two-wire method'.
 - (ii) Differentiate 'line standard', 'end standard' and 'wavelength standard'. (Give one application of each of them).
2. Attempt any **FOUR** the following : [16]
- (a) State the advantages and limitations of mechanical comparator.
 - (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) Draw a neat labelled sketch of screw thread micrometer. State its principle of working.
 - (e) Explain the terms Calibration and Traceability.
3. Attempt any **FOUR** of the following : [16]
- (a) Define the term 'comparator'. State the characteristics of a good comparator.
 - (b) An angle of $117^\circ 8' 42''$ 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) An angle of $49^\circ 29' 18''$ is to be developed by using standard angle gauge set of 13 pieces. Calculate the gauges required and sketch the arrangement.
 - (d) Distinguish between accuracy and precision with suitable sketch.
 - (e) Define any four factors affecting accuracy of measurements.
4. (a) Attempt any **THREE** of the following: [12]
- (i) Distinguish between 'Alignment test' and 'Performance test' of a machine tool.
 - (ii) Define the terms R_q , CLA, RMS and R_z values with respect to surface finish.
 - (iii) 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.
 - (iv) What is the meaning of $35H_8f_8$? State meaning of each term.
4. (b) Attempt any **ONE** of the following: [6]
- (i) Compare single and double sampling plans.
 - (ii) Define TQM. Describe any 3 principal elements of TQM.

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

[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 gear tooth vernier. State mathematical relations to compute chordal addendum and chordal tooth thickness.
- (c) With a neat sketch, explain measurement of tooth thickness by constant chord method.

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

[16]

- (a) Explain in brief two wire method for thread measurement.
- (b) Following are the inspection results of magnets for 10 observations. Draw appropriate control chart and write your conclusion.

Given : $A_2 = 0.58$, $d_3 = 0$, $d_4 = 2.11$

Day	1	2	3	4	5	6	7	8	9	10
No. of defective magnets	58	83	70	80	72	58	64	78	80	84
Magnets inspected	721	728	720	730	720	700	710	700	710	740

- (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

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Paper Discussion Schedule for T.Y. Diploma (Sem. V) – All Subjects

Date	Day	Timing	Centres
14 Nov. 2016	Monday	9 a.m. to 11 a.m.	Dadar, Nerul
14 Nov. 2016	Monday	12 a.m. to 2 p.m.	Thane