

POSTAL Book Package

2027

GATE • PSUs

PRODUCTION AND INDUSTRIAL ENGINEERING

Objective Practice Sets

Quality and Reliability

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Metrology and Inspection

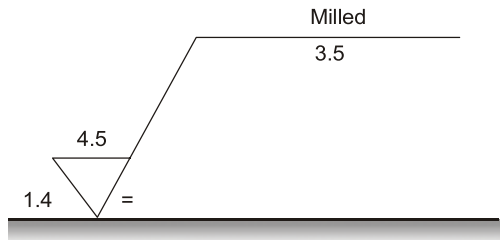
MCQ and NAT Questions

- Q.1** The degree of closeness of the measured value of a certain quantity with its true value is known as
(a) Accuracy (b) Standard
(c) Precision (d) Sensitivity
- Q.2** Error of Measurement =
(a) True Value – Measured Value
(b) Precision – True Value
(c) Measured Value – Precision
(d) None of the above
- Q.3** Which one of the following is used to check the diameters of holes.
(a) Plug Gauge
(b) Ring Gauge
(c) Slip Gauge
(d) Standard Screw Pitch Gauge
- Q.4** Flatness of slip gauges is checked with
(a) Interferometer
(b) Optical Flat
(c) Electronic Comparator
(d) Linear Bar and Bevel Protector
- Q.5** A ring gauge is used to measure
(a) Outside diameter but not roundness
(b) Roundness but not outside diameter
(c) Both outside diameter and roundness
(d) Only external threads
- Q.6** 'Go' and 'No-Go' gauge is a type of
(a) Plug Gauge (b) Ring Gauge
(c) Both (a) and (b) (d) Limit Gauge
- Q.7** Which one of the following is NOT a method to find effective thread diameter?
(a) Thread Micrometer
(b) Two Wire Method
(c) Three Wire Method
(d) The V-piece Method
- Q.8** The flatness error of machine bed and slide can be measured using
(a) Vernier Calipers
(b) Auto Collimator
(c) Height Gauge
(d) Tool Maker's Microscope
- Q.9** Flatness error can be defined as
(a) Maximum separation of a pair of parallel planes which will contain all points on the surface.
(b) Minimum separation of a pair of parallel planes which will contain all points on the surface.
(c) Minimum separation of a pair of perpendicular planes which will contain all points on the surface.
(d) Maximum separation of a pair of perpendicular planes which will contain all points on the surface.
- Q.10** Which one of the instrument is a comparator?
(a) Tool Makers Microscope
(b) Go/No Go Gauge
(c) Optical Interferometer
(d) Dial Gauge
- Q.11** What is the effect of wear on the size of 'Go' snap gauges?
(a) Decrease
(b) Increase
(c) May increase or decrease
(d) No effect
- Q.12** If work tolerance is less than 0.09 mm than how much wear allowance is applied to 'Go' guage?
(a) 0% (b) 5%
(c) 20% (d) 10%
- Q.13** Feeler gauges are used to :
(a) Find the thickness of workpiece
(b) Measure the gap width
(c) Check straightness
(d) Check flatness

- Q.14** Which of the following instrument is of the highest accuracy?
 (a) Digital Length Gauge
 (b) Inside Micrometer
 (c) Universal Measuring Instrument
 (d) Universal Height Micrometer
- Q.15** What is the use of V-blocks?
 (a) For checking only squareness
 (b) For checking roundness
 (c) Only for the support purposes
 (d) To support triangular surfaces only
- Q.16** Which of the following option is incorrect with respect to angle gauges?
 (a) Sine bar is better than angle gauges.
 (b) Angle gauges are made of high carbon chromium steel.
 (c) Angle gauges can measure the angle from 0° to 360°.
 (d) They are available in two sets of 13 and 16 gauges.
- Q.17** In absence of parallelism, what is the size of slip gauge?
 (a) Distance between two measuring faces.
 (b) Distance between the centre of the exposed face to the surface of a body.
 (c) Distance between the top edge of the exposed surface and same edge of a body.
 (d) Distance between the contacting part of gauge and body.
- Q.18** Which of the following grade of a hole is mostly used for non-circular fits?
 (a) H5 (b) H6
 (c) H7 (d) H9
- Q.19** Upto which angle sine bars can measure the angles?
 (a) 45 degree (b) 60 degree
 (c) 90 degree (d) 120 degree
- Q.20** In an engineering drawing one finds the designation of 20G7f8, the position of tolerance of the hole is indicated by
 (a) Letter G (b) Letter f
 (c) Number 7 (d) Number 8
- Q.21** A shaft of diameter $20_{-0.15}^{+0.05}$ mm and a hole of diameter $20_{+0.10}^{+0.20}$ mm when assembled would yield.
 (a) Transition Fit (b) Interference Fit
 (c) Clearance Fit (d) None of these
- Q.22** The fit on a hole shaft pair system is specified as H7-h6, the type of fit is
 (a) Clearance Fit (b) Sliding Fit
 (c) Push Fit (d) Interference Fit
- Q.23** A hole is of dimension $\phi 10_{+0.000}^{+0.015}$ mm. The corresponding shaft is of dimension $\phi 10_{+0.001}^{+0.010}$ mm. The resulting assembly has
 (a) Loose running fit (b) Close running fit
 (c) Transition fit (d) Interference fit
- Q.24** Which one of the following is clearance fit?
 (a) $\phi H50_{+0.005}^{+0.015} h50_{+0.000}^{-0.010}$
 (b) $\phi H50_{+0.000}^{-0.015} h50_{+0.005}^{+0.025}$
 (c) $\phi H50_{+0.000}^{+0.010} h50_{+0.015}^{+0.025}$
 (d) $\phi H50_{-0.000}^{-0.010} h50_{+0.005}^{+0.030}$
- Q.25** Clearance in a fit is the difference between
 (a) Maximum hole size and minimum shaft size
 (b) Minimum hole size and maximum shaft size
 (c) Maximum hole size and maximum shaft size
 (d) Minimum hole size and minimum shaft size
- Q.26** Which of the following is an interference fit?
 (a) Push fit (b) Running fit
 (c) Sliding fit (d) Shrink fit
- Q.27** Following dimensions of the mated parts are given :
 Hole : 37.50 mm
 37.52 mm
 Shaft : 37.47 mm
 37.45 mm
 Find the value of hole tolerance (in mm)
- Q.28** In Q.27, find the value of the shaft tolerance (in mm).
- Q.29** In Q.27, find the value of allowance (in mm) according to basic hole system.
- Q.30** A shaft is rotating in a bearing of 75 mm dia. The tolerance for both shaft and bearing is 0.075 mm and the required allowance is 0.10 mm. Determine the high limit of shaft (in mm) with basic hole standard.

- Q.73** Which of the following is/are the design principles common to Jigs and Fixtures.
- (a) Use of ejectors for large and heavy objects.
 - (b) Rigidity should be sufficient.
 - (c) Machining on workpiece must be clearly visible to worker.
 - (d) Should be open to minimise chip and burn accumulation.

- Q.74** Given below is the graphical representation of a surface texture in drawing. Choose the correct option/s



- (a) The R_a value of surface is $4.5 \mu\text{m}$
- (b) The cut off length is 3.5 mm
- (c) The R_a value of surface is $3.5 \mu\text{m}$
- (d) The cut off length is 4.5 mm



Answers Metrology and Inspection

- | | | | | | | |
|------------------|--------------|------------------|---------------|------------------|---------------|-------------|
| 1. (a) | 2. (a) | 3. (a) | 4. (a) | 5. (c) | 6. (d) | 7. (d) |
| 8. (b) | 9. (b) | 10. (d) | 11. (b) | 12. (a) | 13. (b) | 14. (c) |
| 15. (b) | 16. (a) | 17. (b) | 18. (d) | 19. (a) | 20. (a) | 21. (c) |
| 22. (a) | 23. (c) | 24. (a) | 25. (b) | 26. (d) | 27. (0.02) | 28. (0.02) |
| 29. (0.03) | 30. (74.90) | 31. (74.825) | 32. (75) | 33. (75.2625) | 34. (75.4875) | 35. (0.038) |
| 36. (0.005) | 37. (24.986) | 38. (24.996) | 39. (25.016) | 40. (0.030) | 41. (-0.0297) | 42. (b) |
| 43. (d) | 44. (c) | 45. (a) | 46. (2) | 47. (26.355) | 48. (c) | 49. (1.732) |
| 50. (0.723) | 51. (0.75) | 52. (6) | 53. (1.2) | 54. (34.05) | 55. (1.07) | 56. (43.33) |
| 57. (38.94) | 58. (0.16) | 59. (0.23) | 60. (a) | 61. (b) | 62. (5) | 63. (c) |
| 64. (a) | 65. (c) | 66. (d) | 67. (20.010) | 68. (20.0540) | 69. (a, d) | |
| 70. (a, b, c, d) | | 71. (a, b, c, d) | 72. (a, c, d) | 73. (a, b, c, d) | 74. (a, b) | |

Explanations Metrology and Inspection

- 1. (a)**
Accuracy is defined as the degree of closeness of the measured value of a certain quantity with its true value.
- 2. (a)**
Error of Measurement
= True Value – Measured Value
- 3. (a)**
Plug Gauge is used to check the diameters of holes.
- 4. (a)**
Flatness of slip gauges is checked with optical interferometer.
- 5. (c)**
A ring gauge is used to measure both roundness and outside diameter.
- 6. (d)**
Limit gauges are of two types :
(i) Go gauge
(ii) Not-go gauge