1. Who made the following classic statement.

"When you can measure what you are speaking about and express it in numbers, you know something about it, and when you can't express it in numbers, your knowledge, is of a meagre and unsatisfactory kind. It may be the beginning of knowledge, but you have scarcely in your thought advanced to the stage of science."

(a) Arnold Young
(b) Taylorson
(c) Johanson
(d) Lord Kelvin
(e) Taylor.

2. The ease with which observations can be made accurately is referred to as

(a) readability
(b) sensitivity
(c) accuracy
(d) precision
(e) repeatability.

3. Accuracy of measuring equipment is

(a) the closeness with which a measure-ment can be read directly from a measuring instrument.
(b) a measure of how close the reading is to the true size.
(c) the difference between measured value and actual value
(d) the smallest change in measurand that can be measured
(e) the capability to indicate the same reading again and again for a given measurand.

4. Which of the following error's are generally distributed in accordance "with the Gaussian distribution

(a) controllable errors
(b) calibration errors
(c) avoidable errors
(d) random errors
(e) error due to ambient conditions.

6. Tolerances are specified

(a) to obtain desired fits
(b) because it is not possible to manufac¬ture a size exactly
(c) to obtain high accuracy

(d) to have proper allowance
(e) to have proper inspection.

7. Which of the following is the most important characteristic of a measuring instrument in general
(a) precision
(b) accuracy
(c) repeatability
(d) sensitivity
(e) readability.

8. Sensitivity and range of measuring instrument have
(a) direct relationship
(b) linear relationship
(c) inverse relationship
(d) unpredictable relationship
(e) no relationship.

9. Systematic errors are
(a) randomly distributed
(b) regularly repetitive in nature
(c) distributed on both + ve and – ve sides of mean value
(d) unknown errors
(e) of unpredictable nature.

10. Precision of measuring equipment is
(a) the closeness with which a measure¬ment can be read directly from a measuring instrument
(b) a measure of how close the reading is to the true size
(c) the difference between measured value and actual value
(d) the smallest change in measurand that can be measured
(e) the capability to indicate the same reading again and again for a given measurand.

11. The maximum amount by which the result differs from the true value is called
(a) correction
(b) discrepancy
(c) error
(d) accuracy
(e) uncertainty.

12. Response is defined as the measure of a system's fidelity to purpose. The response of measuring instruments may be considered to the following cases

(a) amplitude response
(b) frequency response
(c) phase response
(d) delay or rise time
(e) all of the above.

13. Which of the following can be used to scribe lines parallel to the edges of a part

(a) vernier calipers
(b) screw gauge
(c) divider
(d) hermaphrodite caliper
(e) combination set.

14. Which of the following can't fall under the head — controllable errors

(a) calibration errors
(b) environmental errors
(c) avoidable errors
(d) random errors
(e) non-similarity of conditions while calibrating and measuring.

15. Which of the following errors are regularly repetitive in nature

(a) systematic errors
(b) random errors
(c) illegitimate errors
(d) controllable errors
(e) avoidable errors.

16. Which of the following errors are inevitable in the measuring system and it would be vainflul exercise to avoid them

(a) systematic errors
(b) random errors
(c) calibration errors
(d) environmental errors
(e) deformation errors.

18. Which of the following instruments is most accurate

(a) vertical caliper

(b) manometric screw gauge

(c) optical projector

(d) mechanical comparator

(e) slip gauges.

19. Which of the following refers to parasitic error.

(a) Error, often gross, which results from incorrect execution of measurement

(b) algebraic difference between the results of measurement and the value of comparison

(c) error which varies in an unpredictable manner in absolute value and in sign when a large number of measurements of the same value of a quantity are made under practically identical conditions.

(d) disagreement between the result of measurement and the value of the quantity measured

(e) error which during several measure-ments, under the same conditions of the same value of a certain quantity, remains constant in absolute value and sign or varies in accordance with a specified law when the conditions change.

20. Which of the following characterises the dispersion of the results obtained in a & ries of measurements of the same value of a quantity measured

(a) absolute error

(b) relative error

(c) root mean square deviation

(d) uncertainty of measurement

(e) variation of indication.

21. A surface gauge is used for

(a) levelling the surface plate

(b) checking the surface finish

(c) laying out the work accurately

(d) finding the depth of the surface

(e) finding flatness of surfaces.

22. Parasitic error is caused due to

(a) improper use of measuring instrument

(b) wrong design of instrument

(c) changes in ambient conditions
(d) errors in computation
(e) deflection of stylus.

24. A feeler gauge is used to check
(a) radius
(b) screw pitch
(c) surface roughness
(d) unsymmetrical shape
(e) thickness of clearance.

25. Measuring mechanism whose mobile component attains its equilibrium position without oscillations round new position is called
(a) damped measuring mechanism
(b) aperiodic measuring mechanism
(c) stable measuring mechanism
(d) precise measuring mechanism
(e) analogue measuring mechanism.

26. Measuring instrument which conforms to all the specified statutory provisions is called
(a) ordinary measuring instrument
(b) measuring' instrument acceptable for verification
(c) auxiliary measuring instrument
(d) legal measuring instrument
(e) statutory measuring instrument.

27. Measuring instrument intended to define or present physically, conserve or reproduce the unit of measurement of a quantity (or a
multiple or sub-multiple of that unit) and to transfer it to other measuring instruments by comparison is known as
(a) legal measuring standard
(b) secondary standard
(c) working standard
(d) primary standard
(e) standard.

28. Work is usually required to be held in a vertical position for laying out. For this purpose, it is

clamped to

(a) surface plate

(b) an angle plate

(c) a V-block

(d) a machine bed

(e) enginee's square.

29. The phenomenon shown by a measuring instrument which gives different indications in a series of measurements of the same value of the quantity measured is called

(a) repeatability of measuring instrument

(b) error of repeatability

(c) dispersion of indications

(d) error of trueness

(e) discrimination of measuring instrument.

30. The quality of a measuring instrument which characterises the ability to respond to small changes of the quantity measured is called

(a) discrimination of a measuring instru-ment

(b) response of a measuring instrument

(c) accuracy

(d) precision

(e) repeatability.

31. Instrument which is designed to eliminate the personal element of feel when setting a measuring instrument is called

(a) fiducial indicator

(b) zero setting device

(c) auxiliary measuring instruments

(d) measuring standard

(e) indicating element.

32. The thickness of light gauge sheet steel can be best checked with a

(a) finely divided steel scale

(b) depth gauge

(c) hermaphrodite caliper

(d) micrometer

(e) thickness measuring machine fitted with dial gauge.

33. Which of the following gives an idea about the ability of the equipment to detect small vartiation in the input signal (quantity being measured)

(a) readability
(b) accuracy
(c) sensivity
(d) precision
(e) repeatability.

34. If attempts are made to make an instrument very sensitive, which of the following qualities is likely to be impaired

(a) precision
(b) accuracy
(c) readability
(d) rangeability
(e) all of the above.

35. Optical flats are made of

(a) quartz
(b) glass
(c) plastic
(d) steel
(e) silicon.

36. The axis of measurement of the scale or other dimensional reference should coincide. This principle is called the

(a) principle of kinematic design
(b) principle of alignment
(c) principle of linear measuring instru-ments
(d) principle of collinearity
(e) principle of location and movement.

37. Pick out the wrong statement about flexible strips.

(a) These are used in instruments where small movements are required between component parts
(b) no force or torque is required to dis-place a member located on flexible strip from its mid position
(c) it has no friction or backlash

(d) it is not subjected to wear
(e) it has negligible hysterisis.

38. The least count of a metric vernier caliper having 25 divisions on vernier scale, matching with 24 divisions of main scale (1 main scale division = 0.5 mm) is
(a) 0.05 mm
(b) 0.01 mm
(c) 0.02 mm
(d) 0.001 mm
(e) 0.005 mm.

39. A scale in which the distance between graduations if proportional to the value of that graduation is called
(a) regular scale
(b) equidistant scale
(c) linear scale
(d) line scale
(e) continuous scale.

40. A scale whose graduation marks are in a discontinuous manner and are composed of aligned numbers indicating directly the numerical value of the quantity measured is called
(a) linear scale
(b) base of a linear scale
(c) equidistant scale
(d) regular scale
(e) digital scale.

41. Element of the indicating device carrying the scale is called
(a) dial
(b) housing
(c) transducer
(d) index
(e) frame.

42. The thread micrometer measures
(a) the major diameter of the thread
(b) the minor diameter of the thread

(c) the effective diameter of the thread
(d) the root diameter of the thread
(e) all the diameters of the thread.

43. V-block is used in the workshop to check
(a) roundness of a cylindrical work
(b) surface roughness
(c) dimensions of oval job
(d) taper on a job
(e) none of the above.

44. Repeatability of measuring equipment is
(a) the closeness with which a measurement can be read directly from a measuring instrument
(b) a measure of how close the reading is to the true size
(c) difference between measured value and actual valve
(d) the smallest change in measurand that can be measured
(e) the capability of indicate the same reading again and again for a given measurand.

45. The purpose of ratchet screw in micrometer screw gauge is
(a) to lock a dimension
(b) to impart blow motion
(c) to maintain sufficient and uniform measuring pressure
(d) to take care of wear of screw threads
(e) to allow zero adjustment.

46. The purpose of adjusting nut in a micrometer screw gauge is to
(a) take care of zero error
(b) impart slow motion
(c) compensate for wear between screw and nut
(d) take care of backlash
(e) ensure uniform measuring pressure.

47. The taper of internal dovetail can be measured with the help of
(a) sine bar
(b) combination set
(c) balls of standard dimensions and slip gauges
(d) clinometer

(e) dial gauges.

48. External taper can be accurately measured with the help of
(a) sine bar and slip gauges
(b) dividing head
(c) precision balls and height gauge
(d) combination set
(e) clinometer.

49. Stick micrometers are designed for measuring
(a) bore of cylinders
(b) longer external lengths
(c) cylindricity
(d) longer internal lengths
(e) diameters which can't be easily accessed.

50. Differential screw micrometer is used
(a) to give direct indication of difference between two readings
(b) to measure gap between grooves
(c) for digital readout
(d) to_ measure diameter of inaccessible holes
(e) for very high degree of accuracy.

51. A sine bar is specified by
(a) its total length
(b) the centre distance between the two rollers
(c) the size of the rollers
(d) the distance between rollers and upper surface
(e) weight of sine bar.

52. The diameter of very large bores can be, measured accurately by
(a) flexibile graduated tape
(b) cylindrical gauge
(c) keilpart gauge
(d) four balls method
(e) swinging a pin gauge in the bore.

53. The number of slip gauges in a set are

(a) 87

(b) 45

(c) 103

(d) 31

(e) all of the above sets are available.

54. Profile of a gear tooth can be checked by

(a) sine bar

(b) bench micrometer

(c) optical pyrometer

(d) optical projector

(e) slip gauges.

55. Gear tooth caliper is used to find the chordal thickness of the following type of gear tooth

(a) spur gears

(b) helical gears

(c) worm gears

(d) bevel gears

(e) any type of gear.

57. The M-and E-system in metrology are related with measurement of

(a) gears

(b) screw threads

(c) flatness

(d) angularity

(e) surface finish.

58. All the thread characteristics can be measured precisely with

(a) screw pitch gauge

(b) micrometer with V-anvil

(c) tool room microscope

(d) thread gauge

(e) thread measuring machine.

59. The advantage of vernier calpier over micrometer is that it

(a) is easier and quicker to use

(b) is more accurate
(c) can be used to make both inside and outside measurments over a range of sizes
(d) all of the above
(e) none of the above.

60. Standards to be used for reference purposes in laboratories and workshops are referred to as
(a) primary standards
(b) secondary standards
(c) tertiary standards
(d) working standards
(e) none of the above.

62. The combination set can be used to
(a) check angular surfaces
(b) draw circles and arcs
(c) scribe lines
(d) all of the above
(e) none of the above.

63. In layout work, a pencil should not be used to draw lines on metal because
(a) it will wipe off easily
(b) the line will be too wide for accurate work
(c) the lines will smudge and be difficult to see
(d) the lines do remain on metal even after good rubbing
(e) all of the above.

64. Surface plate is usually made of grey cast iron because it provides
(a) non wearing plate
(b) very hard plate
(c) easy to cast plate
(d) lubrication due to graphite flakes
(g) stable plate.

65. The term traceability in Engineering Metrology is concerned with
(a) measuring machines
(b) optical instruments
(c) pneumatic comparator

(d) standards
(e) limits and fits.

66. In selective assembly
(a) parts in an assembly can be replaced by a similar part without any further alteration
(b) parts are produced on hole basis sys¬tem
(c) all the parts are always interchange¬able
(d) the size of one of the components is measured accurately and then mating component is made to match with this
(e) the parts of any one type are classified into several groups according to size.

67. Constant measuring pressure in micrometer screw gauges is ensured by
(a) locknut
(b) barrel and thimble
(c) spindle
(d) spanner
(e) ratchet.

69. The basic unit in angular measurements is
(a) degree
(b) minute
(c) second
(d) right angle
(e) 360°

70. Optical gauge works on the principle of
(a) refraction
(b) reflection
(c) dispersion
(d) polarisation
(e) interference of light rays.

74. Circular scale of the micrometer is marked on
(a) anvil
(b) barrel
(c) ratchet
(d) thimble

(e) spindle.

75. According to well accepted practice, slip gauges which have been handled for a few minutes should be left for sometime. The reason for this could be

(a) the moisture transferred from hand would evaporate
(b) the structure of gauges, if disturbed would stabilise
(c) gauges attain the room temperature again
(d) with continuous use, gauges may wear quickly
(e) there is no such practice.

76. Which of the following is not the essential requirement for accuracy of measurement with a sine bar

(a) flatness of upper surface
(b) equality of size and roundness of rollers
(c) exact distance between roller axes and mutual parallelism
(d) parallelism between top and bottom surfaces
(e) parallelism of rollers to upper surface and equality of axis distance as from, surface.

18,77. The following type of gauges has gauging sections combined on one end

(a) combination gauge
(b) limit gauge
(c) Go and No Go gauge
(d) fixed gauge
(e) progressive gauge.

78. The vernier reading should not be taken at its face value before an actual check has been taken for

(a) zero error
(b) its calibration
(c) flatness of measuring jaws
(d) temperature equalisation
(e) all of the above.

79. Which comparator utilises the principle of a button spinning on a loop of string

(a) Sigma comparator
(b) Aramson comparator
(c) Optical comparator

(d) Zeiss interferometer
(e) Eden-Rolt comparator.

80. Gear tooth vernier is used to measure
(a) circular pitch
(b) depth of tooth
(c) tooth thickness
(d) addendum and dedendum
(e) pitch line thickness of tooth.

81. Error of measuring equipment is
(a) the closeness with which a measure-ment can be read directly from a measuring instrument.
(b) a measure of how close the reading is to the true size
(c) the difference between measured value and actual value
(d) the smallest change in measureand that can be measured
(e) the capability to indicate the same reading again and again for a given measureand.

82. Which of the following is not provided on combination set
(a) centre head
(b) protractor head
(c) vernier scale
(d) spirit level
(e) squaring head.

83. Universal surface gauge is used
(a) for flatness testing
(b) for layout work and inspection
(c) for measuring profile of complex sur-face
(d) for measuring surface roughness
(e) for measuring concavity of surface.

84. Accuracy is
(a) the repeatability of a measuring process
(b) error of judgement in recording an ob-servation
(c) the ability of instrument to reproduce same reading under identical situations
(d) agreement of the result of a measure-ment with the true value of the measured quantity
(e) the least resolution of an instrument.

85. Random errors follow the following distribution

(a) claussian

(b) hyperbolic

(c) parabolic

(d) t- student

(e) p-distribution.

86. Which one of the following is the least accurate measuring device

(a) air gauge

(b) micrometer screw gauge

(c) optical projector

(d) vernier micrometer

(e) steel scale.

87. Pick up the wrong statement:

(a) Accuracy of an instrument is closeness to the true dimension

(b) Precision represents the degree of repetitiveness.

(c) Sensitivity refers to minimum change in value that the instrument can reliab¬ly indicate.

(d) As the sensitivity of an instrument in-crease, its range of measurement also increases.

(e) If an instrument is not precise it will give different results for same dimen¬sion when measured again and again.

88. Fiducial indicators contain

(a) calibrated scale

(b) a single index mark

(c) micrometer screw movement

(d) optical head

(e) interferometric devices.

89. A comparator for its working depends on

(a) accurately calibrated scale

(b) comparison with standard such as slip gauges

(c) accurate micrometer gauge

(d) optical devices

(e) determining zero error of scale correct-

90. Precision is

(a) the repeatability of a measuring process

(b) agreement of the result of a measure-ment with the true value of the measured quantity

(c) the ability of a measuring device to detect small differences in a quantity being measured

(d) the ability of .an instrument to reproduce same reading under identi¬cal conditions

(e) error of judgment in reading an obser-vation.

91. The thickness of oil film at the surface of slip gauges is of the order of

(a) .005 micron

(b) .1 micron

(c) 1 micron

(d) 10 microns

(e) 100 microns.

92. Pick up the wrong statement. Surface plates are usually made of granite because of following advantages

(a) because of long period of time for relaxing, it is free from built in residual stresses. There is no corrosion effect also.

(b) there is less tendency for it to warp

(c) if a tool or workpiece drops accidently over its surface, residual stresses are not induced

(d) it simply powders somewhat at the point of impact by falling object

(e) it enables the phenomenon of wringing flat surfaces over it.

93. Pick up the wrong statement.

(a) Error is the disagreement between the result of measurement and actual value.

(b) Random error are regularly repetitive in nature and result from improper conditions or procedures that are con-sistant in action

(c) Parasitic error results from incorrect execution of measurement.

(d) Uncertainty of measurement repre-sents the dispersion of the result of measurement defined by the limits of. the error.

(e) Absolute error is the algebraic dif-ference between the result of measure-ment and the value of comparison.

96. Which one of the following instruments is the most accurate

(a) steel scale

(b) micrometer screw gauge

(c) vernier caliper

(d) vernier dial gauge
(e) optical projector.

98. In the case of high precision surface plates of diameter upto 200 mm, the working surface should lie between two parallel planes,
whose maximum distance apart is
(a) 0.005 mm
(b) 0.0005 mm
(c) 0.05 mm
(d) 0.5 mm
(e) 0.001 mm.

106. The lateral faces of slip gauges are at right angles correct to within
(a) ± 1 degree
(b) ± 30 minutes
(c) ± 10 minutes
(d) ± 1 minute
(e) ± 10 seconds.

107. Protector gauge blocks in slip gauges are
(a) used as reference blocks
(b) mounted in the centre of pile
(c) never touched
(d) wrung on the end of combinations
(e) made of same material as the slip gauges.

108. According to accuracy, slip gauges are classed under following number of accuracy classes
(a) two
(b) three
(c) five
(d) seven
(e) ten.

109. A protector in slip gauges is provided to
(a) protect slip gauges when not is use
(b) take up all the wear when in use
(c) clean the slip gauges

(d) facilitate wringing of slip gauges
(e) assemble the slip gauges properly.

114. Pick out the wrong statement about Taylor's principle of gauging.
(a) Go gauges should be full form gauges
(b) Go gauges should check all the related dimensions simultaneously
(c) It is sufficient to use Go gauges on the width and length of the com¬ponent
(d) Not Go gauges should check only one dimension at a time
(e) It is useless to have the Not Go gauges of the full form.

116. The term "Allowance" in limits and fits is usually referred to
(a) minimum clearance between shaft and hole
(b) maximum clearance between shaft and hole
(c) difference of tolerances of hole and shaft
(d) difference between maximum size and minimum size of the hole
(e) difference between maximum size and minimum size of the shaft.

117. Which of the following is the correct way of designating fit
(a) Hs/g7
(b) g7/Hs
(c) 50H8/£7
(d) H8/g7-50
(e) 50H8/50/j7.

119. The standard tolerance unit / in the case of limits and fits for sizes above 500 mm and upto 3150 mm is
(a) 0.45 (W) + 0.00 ID
(b) 0.52 (W) + 0.00 ID
(c) 0.30(W) + 0.042D
(d) 0.005 (W)
(e) 0.004O + 2.1 (D is in mm).

120. Sensitivity of measuring equipment is
(a) the closeness with which a measure-ment can be read directly from a measuring instrument
(b) a measure of how close the reading is to the true size
(c) the difference between measured value and actual value
(d) the smallest change in measurand that can be measured

(e) the capability to indicate the same reading again and again for a given measurand.

121. Newall system of limits and fits is the oldest system working on hole basis system. The grades of holes and shafts
specified respectively are
(a) 2, 6
(b) 1, 8
(c) 4, 12
(d) 6, 20
(e) 8,26.

122. ISA tolerance system consists of following numbers of qualities of tolerance, and grades of fit respectively
(a) 6, 15
(b) 8, 20
(c) 12, 21
(d) 16, 21
(e) 21, 26.

123. Expressing a dimension as 25.3* °05 mm is the case of
(a) unilateral tolerance
(b) bilateral tolerance
(c) limiting dimensions
(d) all of the above
(e) none of the above.

124. Surface roughness on a drawing is represented by
(a) triangles
(b) circles
(c) squares
(d) rectangles
(e) none of the above.

125. Expressing a dimension as 32.5/32.3 mm is the case of
(a) unilateral tolerance
(b) bilateral tolerance
(c) limiting dimension

(d) all of the above
(e) none of the above.

126. A bore of 14.67 mm in a workpiece can be measured by
(a) steel rule
(b) vernier caliper
(c) pneumatic gauge
(d) micrometer
(e) plug gauge.

130. The diameter of finish turned shaft can best be checked with a
(a) combination set
(b) slip gauge
(c) height gauge
(d) micrometer screw gauge
(e) dial indicator.

134. Accurate centring of work mounted in an independent chuck can be determined by using a
(a) centre gauge
(b) height gauge
(c) dial indicator
(d) surface gauge
(e) micrometer.

135. In limits and fits system, basic shaft system is one whose
(a) lower deviation is zero
(b) upper deviation is zero
(c) minimum clearance is zero
(d) maximum clearance is zero
(e) standard tolerance is zero.

136. Which of the following is not the angle measuring device
(a) angle plate
(b) sine bar
(c) bevel protector
(d) angle gauge
(e) combination square.

137. To check the diameter of a twist drill with a micrometer, the measurement must be taken across the

(a) margins of the drill

(b) flutes of the drill

(c) cutting edges of the drill

(d) lips of the drill

(e) web of the drill.

138. Pick out the wrong statement about gauges for internal threads.

(a) The Go screw plug gauge is made to the minimum metal limit and of full form and checks the virtual effective diameter. Any error in the pitch or flank angle of screw affects the effec-tive diameter

(b) The minimum limit of the major diameter and maximum size of the effective diameter are also checked.

(c) Not Go screw plug gauge is made to the maximum effective diameter of the screw thread cleared at the root and crest.

(d) The plain Go and Not Go gauges are used for checking the limits of the size of minor diameter.

(e) The dimensions of Go and Not Go gauges correspond to maximum and minimum minor diameters.

139. Expressing a dimension as 3^°o!o2 mm is the case of

(a) unilateral tolerance

(b) bilateral tolerance

(c) limiting dimensions

(d) all of the above

(e) none of the above.

140. In instrumentation a correction is

(a) an error

(b) the revision applied to the indicated value so that the final result obtained improves the worth of the result

(c) reading-error

(d) range of error-degree of correctness

(e) lowest value of input which does not indicate the result.

141. Many external comparators have anvils or work tables which are grooved. The purpose of this

is to

(a) facilitate supporting of work.

(b) provide three point support to the work

(c) not to pass on inaccuracy of surface to the measurement

(d) trap any dirt on the table so that it does not interfere with the measure¬ment

(e) avoid sticking of standards on the table.

142. Straight edges are used to measure

(a) straight length of parts

(b) flatness

(c) parallelism

(d) perpendicularity

(e) circularity.

143. IS : 919 on limits and fits specifies following numbers of grades of fundamental tolerances, and fundamental deviations

respectively

(a) 25, 18

(b) 25, 16

(c) 18, 22

(d) 18, 25

(e) 18, 20.

144. For general use the measuring tip of a comparator should be

(a) flat

(b) spherical

(c) conical

(d) concave

(e) grooved.

145. Basic shaft and basic hole are those whose upper deviations and lower- deviation respectively are

(a) + ve, - ve

(b) - ve, 4- ve

(c) minimum, minimum

(d) minimum, maximum

(e) zero, zero.

146. The standard tolerance unit is equal to

(a) 0.45 (W) + 0.00ID

(b) 0.45 (W) + 0.00 ID

(c) 0.45 (W) + 0.01D

(d) 0.45 (<D) + 0.0W

(e) 0.45 (W).

where D = geometric means of the lower and upper diameters of a particular diameter step.

147. Eden-Rolt comparator is a popular instrument for the

(a) calibration of slip gauges

(b) absolute measurement of length of slip gauges

(c) measurement of flatness

(d) measurement of angles

(e) measurement of linear movement.

148. It is desirable to handle the slip gauges with a cloth or chamois leather in order to

(a) avoid injury to hands

(b) protect the surfaces of slip gauges

(c) insulate them from the heat of die hand

(d) ensure that the varnish applied on gauges does not come out

(e) none of the above.

149. For grade IT 7, value of tolerance is equal to

(a) 7 i

(b) 10 i

(c) 16 i

(d) 25 i

(e) 40 i.

150. For defining lengui die standard generally followed is

(a) bar standard

(b) end standard

(c) light wave standard

(d) any of the above

(e) none of the above.

151. Planer gauge is used for

(a) testing flatness of surface

(b) adding to utility of measurements on surface plate

(c) angular measurement

(d) testing radius of corners

(e) testing thickness of small gaps.

152. IS specifications specify vernier calipers as type A, B and C. This classification is based on

(a) accuracy

(b) least count

(c) range

(d) internal or external measurement and for marking purpose

(e) type of graduations.

153. The cross-section of straight edges upto 180 mm lengui is

(a) rectangular

(b) circular

(c) I-section

(d) elliptical

(e) L-shape.

154. Optical micrometer is used to

(a) measure small linear displacements

(b) measure surface profiles

(c) measure surface roughness

(d) set very small displacement by rotat-ing the glass block through relatively large angles

(e) check parallelism.

155. Airy points of support are

(a) 0.577 L apart

(b) 0.554 L apart

(c) 0.5 L apart

(d) 0.58 L apart

(e) 0.612 L apart

Where L = lengui of bar.

156. The maximum nurnber of faces in precision polygons can be

(a) 6
(b) 8
(c) 12
(d) 20
(e) 72.

157. In precision polygon, a central hole and small holes are drilled uirough die mickness
(a) for mounting purposes
(b) to achieve high accuracy
(c) for ease of manufacture
(d) to make them light
(e) for decoration.

158. Precision polygons are calibrated from first principles using
(a) one autocollimator
(b) two autocollimators
(c) uiree autocollimators
(d) two precision spirit levels
(e) angle gauges.

159. The fact mat how closely the instrument reading follows the measured variables is termed as
(a) fidelity
(b) accuracy
(c) direshold sensitivity
(d) precision
(e) hysteresis.

160. Which of die following methods is not used for testing straightness
(a) spirit level metiiod
(b) autocollimator
(c) interference method
(d) beam comparator
(e) laser beam.

161. Optical square is
(a) Engineer's square having stock and blade set at 90°
(b) a constant deviation prism having the angle of deviation between the inci-dent ray and reflected

ray, equal to 90°

(c) a constant deviation prism having the angle of deviation between the inci-dent ray and reflected ray, equal to 45°

(d) used to produce interference fringes

(e) used for angular measurement.

162. In a sine bar the standard lengm is measured from

(a) edge to edge

(b) between inner circumference of two rollers

(c) between outer circumference of two rollers

(d) between the centres of two rollers

(e) none of the above.

163. Electronic level instrument is a replacement for

(a) vernier depth gauge

(b) microscope

(c) auto-collimator

(d) angle dekkor

(e) spirit level.

164. Polygons in metrology are concerned with

(a) method of circular dividing

(b) testing of parallelism

(c) testing of circularity

(d) interferrometry measurements

(e) linear measurements.

165. The long straight edges are supported at two points for minimum deflection at centre. The distance between supports compared to the length of straight edge should be

(a) 0.5

(b) 0.554

(c) 0.577

(d) 0.6

(e) 0.677.

166. Bevel protractor is used for

(a) angular measurements

(b) linear measurements
(c) height measurements
(d) flatness measurement
(e) parallelism measurement.

167. Clinometer is related with
(a) Engineer's parallels
(b) angle gauges
(c) spirit level
(d) bevel protractor
(e) tolerance measurement.

168. Pick up the correct statement. A comparator
(a) needs to be calibrated
(b) need not be calibrated
(c) contains a calibrated scale
(d) is highly accurate over its complete measuring range
(e) is best suited for measurement of ab-solute dimensions.

169. Which of the following is the essential condition for interferometry measurement
(a) an air gap (a wedge) of varying thick-ness must exist between the two sur-faces
(b) an optical flat is required
(c) the work surface must be reflective
(d) monochromatic source of light is re-quired
(e) all of the above.

170. Autocollimator is used for
(a) parallelism measurement
(b) straightness measurement
(c) flatness measurement
(d) angular measurement
(e) linear movement measurement.

174. Which one of the following is an angle measuring device
(a) trammel
(b) hermaphrodite caliper
(c) divider

(d) angle iron
(e) sine bar.

175. Filar microscopes
(a) have no reticles
(b) have fixed reticles
(c) have moving reticles
(d) can be.moved relative to the work by means of a fine-pitch lead screw
(e) use a scale on the side of the optical tube to give a measure of the focusing position.

176. A collimator is simply a
(a) source of a bundle of parallel light rays
(b) source of point light
(c) sort of alignment telescope
(d) standard for flatness
(e) device used in interferometric meas-urements.

177. If x be half the included angle of thread and p its pitch, then best size wire's diameter for measurement of effective
diameter of thread is
(a) p/2 sec x
(b) p sec x/2
(c) p cos x/2
(d) p/2 cos x/2
(e) p/2 sec x/2.

178. Angle Dekkor is another type of
(a) auto-collimator
(b) optical square
(c) clinometer
(d) angle gauge
(e) electronic level.

179. The angles of angle gauges in the degrees series are
(a) 1, 3, 9, 25, 42
(b) 1, 3, 9, 27, 81
(c) 1, 3, 9, 27, 41

(d) 1, 5, 10, 25, 45
(e) 2, 3, 5, 27, 41.

180. Wickman gauge is used for inspection of
(a) holes
(b) shafts
(c) gears
(d) tapers
(e) screw threads.

181. Which one of the following is not an angle measuring device
(a) bevel protector
(b) sine bar
(c) combination square
(d) angle iron
(e) angle gauge blocks.

183. The reflector combined with autocollimator can be used for checking
(a) alignment
(b) parallelism
(c) circularity
(d) distance between two far off points
(e) surface finish.

184. Some substances generate voltage when they are subjected to mechanical forces or stresses along specific planes. Such substances are known as
(a) thermo-electric
(b) magneto-electric
(c) piezo-electric
(d) photo-electric
(e) radio-active.

185. Tomlinson recorder is associated with measurement of
(a) surface flaws
(b) surface perpendicularity
(c) surface finish
(d) surface curvature

(e) surface flatness.

186. Which of the following methods is not concerned with surface finish measurement
(a) spectrophotometry method
(b) ultrasonic method
(c) field emission method
(d) critical angle of attack method
(e) Talysurf principle.

189. The only natural material producing a spectral line (6440° A red) almost completely symmetrical is
(a) Cadmium
(b) Mercury
(c) Krypton
(d) Helium
(e) Neon.

190. A photo-electric device in which the resistance of the metal changes directly proportional to the light striking on it, is known as
(a) photo-cell
(b) photo-emission cell
(c) photo-voltaic cell
(d) photo conductive cell
(e) none of the above.

191. Universal surface gauge is used for
(a) checking straightness
(b) checking flatness
(c) checking parallelism
(d) layout work and inspection
(e) checking the surface finish.

194. According to Taylor's Principle, No Gog auge checks
(a) only one feature at a time
(b) only important dimensions at a time
(c) all the dimensions at a time
(d) only the related dimensions at a time

(e) as many dimensions as possible at a time.

195. The primary texture or roughness or micro-errors on surface results due to
(a) normal action of the tool in produc¬tion process
(b) vibrations and non-uniformity of cut-ting process
(c) flaws in material
(d) dominant direction of tool marks (lay)
(e) all of the above*

196. The secondary texture or waviness, or macro-error on surface results due to
(a) normal action of the tool in produc¬tion process
(b) vibrations and non-uniformity of cut-ting process
(c) flaws in material
(d) dominant direction of tool marks (lay)
(e) all of the above.

197. The function of a transducer is
(a) to amplify the input signal
(b) to modify the input signal
(c) to convert the primary signal into a more useful quantity usually an electrical impulse
(d) to codify the input signal
(e) to decodify the input signal.

198. Pick up the correct statement in connection with surface finish.
(a) Pitch of secondary texture is same as pitch of primary texture
(b) Pitch of secondary texture is more than pitch of primary texture
(c) Pitch of secondary texture is less than pitch of primary texture
(d) Pitch of primary and secondary tex-ture can't have any relationship
(e) Pitch of primary and secondary tex-tures is related mathematically.

199. If graduations on beam of a vernier gauge are marked at every 1/2 mm and 10 divisions on vernier scale are on a distance of 9.5 mm, then least count is
(a) 0.1 mm
(b) 0.05 mm
(c) 0.01 mm
(d) 0.02 mm
(e) 0.005 mm.

200. Scale sensitivity is defined as

(a) Ratio of a change in scale reading to corresponding change in pointer deflection

(b) Least reading of scale/range of scale

(c) Least reading of scale/unit measurable quantity

(d) Least count of scale/range of scale

(e) none of the above.

201. A three-lobed part if checked on 60° V block would provide following magnification of the radial out-of-round
characteristics

(a) 1 time

(b) 2 time

(c) 3 time

(d) 4 time

(e) 5 time.

202. A five-lobed part, if gauged in the 60° V-block would produce the following magnification of the radial out-of-round characteristics

(a) 0 time

(b) 1 time

(c) 2 times

(d) 3 times

(e) 5 times.

203. Diametral gauging for out-of-roundness measurement is not sufficient because

(a) it can't sense even lobed parts

(b) radial changes always occur which can't be sensed by it

(c) it is difficult to find true centre

(d) its readings can't be fed to computer

(e) it provides measurement at 2 points only.

204. A plug gauge is used for measuring

(a) cylinders

(b) cylindrical bores

(c) spherical holes

(d) screw threads

(e) angles.