

1. The angle between two curved lines is known as :
 (A) Spherical angle (B) Obtuse angle
 (C) Acute angle (D) Deflection angle
2. Which of the following is the classification based upon the system of surveying ?
 (A) Chain surveying (B) Triangulation surveying
 (C) City surveying (D) Mine surveying
3. The survey that does not deal with mapping of large water bodies is :
 (A) Hydrographic Survey (B) Navigation Survey
 (C) Marine Survey (D) Cadastral Survey
4. During the office work, surveyor does :
 (A) Design of structure (B) Selection of site
 (C) Recording field book (D) Selecting system of work
5. If distance on drawing 2.5 cm, actual distance of object 1m. Then representative factor of scale is :
 (A) $\frac{1}{2.5}$ (B) $\frac{100}{2.5}$ (C) $\frac{1}{40}$ (D) $\frac{2.5}{1}$
6. The simplest figure which can be plotted without angles but with sides :
 (A) Pentagon (B) Octagon (C) Hexagon (D) Triangle
7. The Survey line which fixes up the direction of all other Survey line is :
 (A) Tie line (B) Base line (C) Check line (D) None of these
8. The Instrument which automatically records the number of steps taken placing in a given survey line :
 (A) Pedometer (B) Odometer (C) Passometer (D) Speedometer

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[P.T.O.]

19. One significance of 'Y level' :
 (A) No loose part (B) Peg adjustment is inconvenient
 (C) No wearing of parts (D) Not rigid in construction
20. Which of the following, Bench mark is established with high precision ?
 (A) Permanent Benchmark (B) G. T. S. Benchmark
 (C) Temporary Benchmark (D) None of these
21. If higher contours are inside and lower contours are outside, object will be :
 (A) Hill (B) Depression in ground
 (C) Ridge line (D) Valley line
22. Which one is one significance of direct methods of contouring ?
 (A) Very cheap (B) Used for hilly area
 (C) Most accurate (D) Route Survey for Canal
23. The need of drawing cross section from a contour map is to calculate :
 (A) Total length of road (B) Slope
 (C) Alignment (D) Earth work
24. Contour line cross each other in case of :
 (A) Ridge line (B) Overhanging cliff
 (C) Valley line (D) None of these
25. Contour Interval is kept higher when :
 (A) Money available is limited (B) Field work is smaller
 (C) Work is not important (D) Office work is smaller

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9. Too long chain may be adjusted by :
- (A) Closing up the joints (B) Inserting new ring
(C) Replacing large size rings (D) Straightening any link
10. One of the duties of leader in chain surveying is :
- (A) Pick up the arrows (B) To obey instruction of follower
(C) To carry rear end of chain (D) Stretching chain tight
11. The surveying best suited for dense area and fall of many details is :
- (A) Plane table surveying (B) Chain surveying
(C) Theodolite surveying (D) Compass surveying
12. Part of compass adjusting the prism according to eye height is :
- (A) Hinged strap (B) Lifting lever (C) Focussed stud (D) Eye vane
13. Whole circle bearing 176° equal to quadrantal bearing of :
- (A) $E 4^\circ S$ (B) $S 176^\circ E$ (C) $S 4^\circ E$ (D) $N 4^\circ W$
14. The difference between forebearing and backbearing of a survey line should be :
- (A) 180° (B) 0° (C) 360° (D) 90°
15. In which step of field works, area of plot is divided into polygon or triangle, in compass surveying ?
- (A) Marking station (B) Reconnaissance of area
(C) Traversing (D) Plotting
16. Which one is, in the following, that does not have the object of levelling ?
- (A) To fix Benchmark (B) To find profile of road
(C) Indirect ranging (D) To show contour
26. Which one is not a part of Telescopic alidade ?
- (A) Vertical Circle (B) Support
(C) Horizontal Circle (D) Fiducial edge
27. Systematic operation of temporary adjustment of planetable is :
- (A) Orientation after observation (B) Observation after orientation
(C) Levelling after orientation (D) Centering after levelling
28. Magnetic needle method is used in plane table when :
- (A) Required less accuracy (B) doing survey at any place
(C) Second station is available (D) No possibility of error
29. When surveying control from a single station and in smaller area, the method of surveying is :
- (A) Two point problem (B) Radiation
(C) Three point problem (D) Intersection method
30. Merits of plane table Surveying is :
- (A) Can replot the map (B) Surveying done in wet climate
(C) Recommended for precise work (D) Suitable for small scale map
31. When calculating boundary area, total no. of ordinates must be odd in :
- (A) Trapezoidal rule (B) Average ordinate rule
(C) Mid Ordinate rule (D) Simpson's rule
32. Three successive ordinates are 2m, 1m and 2m and interval between ordinates is 10m, Then area enclosed by ordinate by Simpson's rule in m^2 :
- (A) 27 (B) 30 (C) 26.67 (D) 33.33

33. A ceylon ghat tracer does not consist :
(A) Tripod (B) Brass sighting tube
(C) Small hole (D) Cross wire
34. Sextend is used for measuring :
(A) Bearing (B) Length (C) Angle (D) Slope
35. The instrument which is having mirror, metal frame and gimbal is :
(A) Box sextent (B) Clinometer (C) Ghat tracer (D) Hand level
36. A Theodolite whose telescope can be revolved through a complete revolution in vertical plane about it's horizontal axis, is known as :
(A) Vernier theodolite (B) Micrometer theodolite
(C) Alidade theodolite (D) Transit theodolite
37. Size of theodolite varies from :
(A) 10 to 30 cm (B) 10 to 30 mm (C) 5 to 10 cm (D) 30 to 35 cm
38. Three screw type theodolite is preferred when :
(A) Centred more quickly (B) Levelled more quickly
(C) Parallaxing more quickly (D) Distributing uneven pressure on screw
39. Theodolite standards are having shape of :
(A) C (B) U (C) A (D) S
40. Least count of transit theodolite reading :
(A) 30 minutes (B) 20 minutes (C) 1 minute (D) 20 seconds
41. Plumb bob of theodolite is suspended from :
(A) plate (B) hole (C) hook (D) ring
42. Axis about which telescope of theodolite can be rotated in horizontal plane is known as :
(A) Vertical axis (B) Horizontal axis
(C) Axis of Telescope (D) Axis of level tube

43. In double Vernier theodolite :
- (A) Main scales are marked in one direction
 - (B) Main scales are marked in both directions
 - (C) Attached single vernier
 - (D) One single vernier is marked
44. When focussing object glass, Telescope is :
- (A) Transited
 - (B) Inverted
 - (C) Rotated
 - (D) Directed to object
45. Direct angle Obtained from theodolite may be between :
- (A) 0° and 360°
 - (B) 0° and 90°
 - (C) 0° and 180°
 - (D) None of these
46. Point of curve is also known as :
- (A) apex
 - (B) end of curve
 - (C) beginning of curve
 - (D) point of intersection
47. Relation between Radius 'R' and degree of curve D in curve setting, for 20 m chain, is :
- (A) $R = \frac{20}{D}$
 - (B) $R = 20 D$
 - (C) $R = \frac{1719}{D}$
 - (D) $R = \frac{1146}{D}$
48. Compound curve has :
- (A) Curves in opposite direction
 - (B) Arcs of different radius
 - (C) Length of straight line between Curves
 - (D) Arcs of same radius
49. If tangent distance 20 m and radius of curve 200 m, when setting out curve, Radial offset from tangent is equal to :
- (A) 1 m
 - (B) 20 m
 - (C) 200 m
 - (D) None of these
50. Magnitude of Centrifugal force along a curved track, generally is :
- (A) Inversely Proportional to weight of vehicle
 - (B) Inversely Proportional to radius of curvature
 - (C) Inversely Proportional to speed of vehicle
 - (D) None of these

51. For the computation of earth work, the data not required is :
- (A) Formation width (B) Bottom width of cutting
(C) Top width of cutting (D) Top width of embankment
52. Full detailed survey work along the most economical route of road is done by :
- (A) Reconnaissance survey (B) Traffic survey
(C) Preliminary survey (D) Location survey
53. A road has given maximum gradient 1 in 50 minimum gradient 1 in 200. What will be possible exceptional gradient value when designing same road ?
- (A) 1 in 100 (B) 1 in 50 (C) 1 in 30 (D) 1 in 200
54. General application of 'chain thin double dash line' in engineering drawing :
- (A) Centroidal line (B) Central line (C) Hidden out line (D) Cutting plane
55. The line passing through the focus and perpendicular to the directrix in conic technology is :
- (A) Normal (B) Axis (C) Tangent (D) Base line
56. The command allowing to set lower left corner and upper right corner of drawing area in autocad is :
- (A) Rectangle (B) View (C) Point (D) Limit
57. To draw two rectangles 50×100 cm and 250×350 cms, in autocad, set the snap to :
- (A) 100 (B) 250 (C) 50 (D) 350
58. Which command in autocad, connect between two lines or arcs or circles with an arc ?
- (A) Fillet (B) Circle (C) Arc (D) Line
59. The term 'Lap' represents in brick masonry as :
- (A) Vertical distance (B) Horizontal distance
(C) Inclined distance (D) None of these

60. A junction means connection between a main wall and a :
- (A) Floor (B) Main wall (C) Basement floor (D) Partition wall
61. Inclined surface of brick work should be checked by :
- (A) Spirit level (B) Plumb bob
(C) Wooden template (D) Square
62. Brick should be saturated with water before making wall so as to prevent absorption of moisture from :
- (A) Mortar (B) Air (C) Ground (D) None of these
63. Magnet represents all material which attracts :
- (A) Silver (B) Aluminium (C) Wood (D) Iron
64. ' $4 \cos^3 \alpha - 3 \cos \alpha$ ' is equal to :
- (A) $\cos 3\alpha$ (B) $\cos 4\alpha$ (C) $\cos 2\alpha$ (D) $\cos \frac{\alpha}{2}$
65. $\tan \alpha$ is equal to :
- (A) $\sqrt{\frac{1 - \sin 2\alpha}{1 + \sin 2\alpha}}$ (B) $\sqrt{\frac{1 - \cos 2\alpha}{1 + \cos 2\alpha}}$ (C) $\sqrt{\frac{1 + \sin 2\alpha}{1 - \sin 2\alpha}}$ (D) $\sqrt{\frac{1 + \cos 2\alpha}{1 - \cos 2\alpha}}$
66. Simplify $(\sec \theta + \tan \theta)(1 - \sin \theta)$:
- (A) $\sin \theta$ (B) $\tan \theta$ (C) $\cos \theta$ (D) $\operatorname{cosec} \theta$
67. Evaluate $\frac{\sin 10^\circ}{\cos 80^\circ}$:
- (A) 1 (B) 2 (C) $\cos 10^\circ$ (D) $\sin 80^\circ$
68. An example which is not optical medium in light theory is :
- (A) Air (B) Stone (C) Water (D) Glass

69. A glass jar contains water to a depth of 32 cm. A button placed at the bottom appears to a depth of 24 cm. Then refractive Index :

- (A) $\frac{3}{4}$ (B) $\frac{4}{3}$ (C) $\frac{2}{3}$ (D) $\frac{3}{2}$

70. The angle between two surfaces at which refraction takes place is called :

- (A) Angle of Incidence (B) Angle of refraction
(C) Angle of emergence (D) Angle of prism

71. Formula for total surface area of a hemisphere of radius r :

- (A) πr^2 (B) $2\pi r^2$ (C) $3\pi r^2$ (D) $4\pi r^2$

72. If $a + b = 9$ and $ab = 20$. Find $a^2 + b^2$:

- (A) 41 (B) 81 (C) 40 (D) 20

73. If major axis 6 cm and minor axis 4 cm, area of ellipse in cm^2 is :

- (A) 24π (B) 10π (C) 1.5π (D) 6π

74. If sides of a triangle are 4 cm and 5 cm and angle between them is 30° , Area of triangle is :

- (A) $\frac{10}{\sqrt{3}} \text{ cm}^2$ (B) $5\sqrt{3} \text{ cm}^2$ (C) 5 cm^2 (D) 10 cm^2

75. Practical application of hyperbola is in :

- (A) Construction of dam (B) Study laws of expansion of gas
(C) Man hole of boiler (D) Stuffing box glands

76. Evaluate $\frac{1}{\sqrt{3} + \sqrt{2}} + \frac{1}{\sqrt{3} - \sqrt{2}}$:

- (A) $3\sqrt{2}$ (B) $-2\sqrt{3}$ (C) $2\sqrt{3}$ (D) $-3\sqrt{2}$

77. Evaluate $\left(\frac{1}{2\sqrt{2}}\right)^3 + \frac{1}{2\sqrt{2}}$:

- (A) $\frac{2\sqrt{9}}{32}$ (B) $\frac{2\sqrt{32}}{9}$ (C) $\frac{32\sqrt{2}}{9}$ (D) $\frac{9\sqrt{2}}{32}$

78. In quadratic equation $4x^3 + 3x + 5 = 0$, sum of their roots is equal to :
- (A) $-\frac{3}{4}$ (B) $-\frac{5}{4}$ (C) $-\frac{3}{5}$ (D) $-\frac{4}{5}$
79. Write one factor of the term $x^2 - x - 6$:
- (A) $x + 3$ (B) $x - 3$ (C) $x - 2$ (D) $x - 1$
80. In the quadratic equation $3x^2 - 5x + 2 = 0$ discriminant value is equal to :
- (A) 3 (B) 2 (C) -5 (D) 1
81. Evaluate $\log_{10} 1000 + \log_e e$:
- (A) 4 (B) \log_e (C) $\log 10$ (D) $\log(e + 1000)$
82. Evaluate $\log_{10} 10^e + \log_e e^2 - e$:
- (A) 10^e (B) e (C) 2 (D) e^2
83. Equal chords of circle always subtend equal angle at :
- (A) circle (B) centre of circle
(C) outside of circle (D) inside of circle
84. Bisector of an angle of the triangle divide the opposite side in the ratio of :
- (A) Sides containing the angle (B) Remaining angles of triangle
(C) 1 : 1 (D) None of these
85. Length of tangents drawn from an external point to a circle are in the ratio of :
- (A) 1 : 2 (B) 1 : 3 (C) 1 : 4 (D) 1 : 1
86. Any rays passing through the centre of curvature of spherical mirror are reflected back along the :
- (A) different angle (B) Same path (C) Principal axis (D) None of these

87. In a concave mirror, position of object is beyond the centre of curvature, position of image will be :
- (A) Behind the mirror
(B) Between focus and pole
(C) Between centre of curvature and focus
(D) Beyond the centre of curvature
88. The material which do not allow light to pass through them at all is called :
- (A) source of light (B) opaque (C) transparent (D) concave glass
89. When a material is subjected to external force, stress is induced :
- (A) outside the material (B) only at surface
(C) at their corner (D) inside the material
90. Within limit of proportionality, the ratio between intensity of stress and strain, when it undergoes deformation, is :
- (A) Constant (B) Variable
(C) 1 : 1 (D) Inversely proportional
91. The bending moment at the free end of a cantilever will always be :
- (A) Negative bending moment (B) Positive bending moment
(C) Zero (D) Changing the BM sign
92. 'Built in beam' is also known as :
- (A) Simply supported beam (B) Fixed beam
(C) Overhanging beam (D) Cantilever beam
93. 6 mm diameter steel bar has approximate weight per metre length :
- (A) 2.47 kg (B) 2.98 kg (C) 3.85 kg (D) 0.22 kg
94. To construct 1m^3 of brick masonry, approximate no. of bricks ($20 \times 10 \times 10$ cms size) required :
- (A) 500 (B) 1000 (C) 1500 (D) 2000

95. To prepare the preliminary estimate for an irrigation channel, the rate is calculated based upon :
- (A) Per unit basis (B) Per head of population
(C) Area of land commands (D) Per litre of water
96. When constructing In circle of a triangle, the centre of circle will be getting when :
- (A) bisecting sides of triangle (B) bisecting any one angle of triangle
(C) bisecting any one side of triangle (D) bisecting any two angles of triangle
97. Evaluate $\cot \theta + \tan (180 + \theta) + \tan (90 + \theta) + \tan (360 - \theta)$:
- (A) Zero (B) Cot θ (C) tan θ (D) $-\cot \theta$
98. Write expression $\left(x + \frac{3}{x}\right) = 4$ in the form of quadratic equation :
- (A) $x^3 + 3 = 4x$ (B) $x^2 - 4x + 3 = 0$ (C) $x^2 + 4x = 3$ (D) $x^2 + 4x + 3 = 0$
99. Area of regular hexagon having side 'a' :
- (A) $\frac{2\sqrt{2}}{3} a^2$ (B) $\frac{3\sqrt{2}}{2} a^2$ (C) $\frac{3\sqrt{3}}{2} a^2$ (D) $\frac{2\sqrt{3}}{3} a^2$
100. If $\log 0.2521 = -0.5984$, Evaluate $\log 0.02521$ approximately :
- (A) -0.0584 (B) $\bar{1}.0584$ (C) -2.4150 (D) $\bar{2}.4015$

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