SANKALP EDUCATION

Marks: 100 **(Mock Test Combo-1) Surveying, Steel & FM** **Time: 60 minutes**

Q1. The main object of running a tie line is

(a) To check accuracy of work
(b) To take details of nearby objects
(c) To take offsets for detailed surveying
(d) None of the above

Q2. The main difference between an optical square and a prims square is

(a) Difference in principle of working
(b) That optical square is more accurate than prism square
(c) That no adjustment is required in a prism square since the angle between the reflecting surfaces cannot be changed
(d) All of the above

Q3. The angle of intersection of the two plane mirrors of an angle of an optical square is

(a) 30° (b) 45°
(c) 60° (d) 90°

Q4. The curvature of the earth is taken into consideration, if the limit of survey is

(a) 50 – 100 km^2 (b) 100 – 250 km^2
(c) > 250 km^2 (d) none of these

Q5. The type of surveying used to determine the details of boundaries, fields etc, is known as

(a) City survey
(b) Cadastral survey
(c) Topographical survey
(d) Geological survey

Q6. Using RF of 1/5000, the distance between two points A and B on the map was found to be 500m. The distance between the same points when measured with a scale of RF 1/1000 will be

(a) 1000 m (b) 100 m
(c) 10 m (d) 10000 m

Q7. The distance between two points is measured with a 30 m chain and was found to be 1840 m. The same distance was measured with a 20 m chain and found to be 1848 m. What is the error in 20 m chain if the 30 m chain was 10 cm too short.

(a) 16 cm too short
(b) 16 cm too long
(c) 19.84 too long
(d) 19.84 too short

Q8. The bearing taken in the opposite direction of progress of survey is known as

(a) Fore bearing (b) Back bearing
(c) Arbitrary bearing (d) None of these

Q9. The whole circle bearing of two lines AB and AC are 115° and 41° respectively, the angle BAC will be

(a) 41° (b) 74°
(c) 115° (d) 156°

Q10. The Magnetic bearing of a line is 35° 30' and declination is 2° 30'W. The true bearing will be

(a) 33° (b) 35°
(c) 38° (d) 36°

Q11. The imaginary lines joining the points of zero magnetic declination is called

(a) Agonic lines (b) Isogonic lines
(b) Isoclinic lines (d) none of these

Q12. Pick the in-correct statements out of these.

(a) The difference between fore bearing and back bearing of a line is always 180° in WCB system
(b) If the difference between fore bearing and back bearing of a line AB is 180 in WCB system, when stations A and B are free from local attraction.
(c) The numerical value of the back bearing of a line remains same as fore bearing in case of reduced bearing system.
(d) Angle of dip is 90° at equator

Q13. The RL of factory floor is 100.0m and staff reading on the floor is 4.62m. Staff reading when staff held inverted with bottom touching the tie beam of the roof truss is 12.16m. The height of tie beam above the floor is

(a) 104.62 m (b) 112.16 m
(c) 16.78 m (d) 116.78 m

Q14. When angular and linear measurements are equally precise in traversing, the balancing of traverse is done by

(a) Bowditch rule (b) Transit rule
(c) Empirical rule (d) None of these

Q15. Shift of the curve is given as

(a) L / 6R (b) L / 24 R
(c) L^2 / 6R (d) L^2 / 24 R

Q16. Which statement is true about relief displacement?

(a) The relief displacement decreases with increase in flying height
(b) The relief displacement increases with increase in flying height
(c) Relief displacement decreases as the distance from the principal point increases
(d) Relief displacement increases as the distance from the principal point decreases

Q17. Which of the following methods of plane table surveying is used to locate the position of an inaccessible point?

(a) Radiation (b) Intersection
(c) Traversing (d) Resection

Q18. Which of the following scales is largest one?

(a) 1 cm = 50 m
(b) 1 : 42000
(c) R.F. = 1/300000
(d) 1 cm = 50 km

Q19. Geodetic surveying is different from the plane surveying because of

(a) The curvature of the earth
(b) The large difference of elevation between various points
(c) Coverage of very large area
(d) Undulations of the topography

Q20. An invar tape is made of an alloy of

(a) Copper and steel
(b) Brass and nickel
(c) Brass and steel
(d) Nickel and steel

Q21. Number of links in a 30 m metric chain is

(a) 100 (b) 150
(c) 180 (d) 200

Q22. Direct ranging is only possible when the end stations are

(a) Close to each other
(b) More than 100 m apart
(c) Mutually inter visible
(d) Located at highest point

Q23. Convert 40 hour 20 minute 20 second into degree system

(a) $605^{o}\,5'$
(b) $540^{o}\,10'$
(c) $620^{o}\,10'$
(d) $580^{o}\,10'$

Q24. A line joining the apex of a triangle to some fixed point on the opposite side is called a

(a) Check line (b) Tie line
(c) Base line (d) None of these

Q25. When the magnetic bearing of the sun at noon is $185^{O}\,20'$, the magnetic declination will be

(a) $5^{o}\,20'$ east (b) $5^{o}\,20'$ west
(c) $5^{o}\,20'$ north (d) $5^{o}\,20'$ south

Q26. When the image formed by the objective lens is not situated in the plane of cross hairs

(a) The cross hair should be adjusted
(b) The eye piece should be focused
(c) The objective should be focused
(d) The parallax should be removed

Q27. Which of the following readings are taken on change point or turning point?

(a) BS and IS (b) FS and IS
(c) BS, IS and IS (d) BS and FS

Q28. An imaginary line joining the points of same elevation on the surface of earth is known as

(a) Contour (b) Isogonic line
(c) Ridge line (d) Contour interval

Q29. The constant vertical distance between two contour is called as

(a) Contour gradient
(b) Horizontal gradient
(c) Contour interval
(d) None of these

Q30. Which of the following affect the contour interval

(a) Scale of map
(b) Nature of terrain
(c) Extent of survey
(d) All of these

Q31. The contour map is applicable in

(a) Selection of suitable site
(b) Estimation of reservoir capacity
(c) Calculation of catchment area
(d) All of these

Q32. A deflection angle in traverse is equal to

(a) Difference between included angle and 180^{o}
(b) Difference between 360^{o} and the included angle
(c) Sum of included angle and 180^{o}
(d) None of these

Q33. An angle measure clockwise from the preceding line to the following survey line is called

(a) Deflection angle
(b) Direct angle
(c) Vertical angle

(d) None of these

Q34. In the plate girder, the vertical stiffeners are provided when the ratio of clear depth to the thickness of web exceeds

(a) 50 (b) 85
(c) 75 (d) 65

Q35. As per ISI rolled steel beam sections are classified

(a) two section (b) three section
(c) four section (d) five section

Q36. If a structure is under fatigue stresses then the weld joints as compared to rivetted joints will fail

(a) earlier (b) later
(c) at the same time (d) not at all

Q37. Which of the following does not describe a weld type?

(a) butt (b) plug
(c) zig-zag (d) lap

Q38. In a structural connection, if the member is subjected compression, then maximum pitch of the joint should be least of 200 mm or

(a) 12 t (b) 16 t
(c) 32 t (d) 16 d

Q39. The maximum shear stress of steel member in flexure shall not exceeds

(a) 0.4fy (b) 0.66fy
(c) 0.5fy (d) 0.45fy

Q40. Battens provided for a compression member shall be designed to carry a transverse shear equal to

(a) 2.5% of axial force in member
(b) 5% of axial force in member
(c) 10% of axial force in member
(d) 20% of axial foirce in member

Q41. As per IS 800, if the tension member is acting at tie member in roof truss and it is subjected to possible reversal of stresses resulting from the action of wind or seismic forces then the slenderness ratio of the member should not be more than

(a) 150 (b) 200
(c) 300 (d) 350

Q42. The size of a butt weld is specified by

(a) throat thickness
(b) the effective throat thickness
(c) thickness of thickest part joined
(d) 7/8 of the thickness of thickest part joined

Q43. The effective length of the fillet weld is

(a) Total length - 2 x throat size
(b) Total length - 2 x weld size
(c) 0.7 x total length Weld size
(d) total length – (weld size/(2) $^{1/2}$)

Q44. The effective length of intermittent weld, in respect of the thickness of the thinner part joined, should not be less than

(a) two times (b) four times
(c) ten times (d) sixteen times

Q45. The net sectional area of a tension member is equal to

(a) gross sectional area minus the maximum deduction for rivet holes
(b) gross sectional area plus maximum deduction for rivet holes
(c) two times the gross sectional area
(d) gross sectional area

Q46. The main beam is a beam which supports

(a) floor construction (b) joists
(c) secondary beam (d) both (b) and (c)

Q47. Any major beam in a structure is known as

(a) subsidiary beam (b) joist
(c secondary beam (d) girder

Q48. The lighter sections of structural members subjected to transverse loading are called as

(a) tie (b) struts
(c) angle (d) stanchions

Q49. In roof trusses, the horizontal beams spanning between the two adjacent trusses are known as

(a) common rafter (b) principal rafter
(c) purlin (d) all the above

Q50.The beams at the outside wall of a building supporting its share of the floor and also the wall up to the floor above it are known as

(a) stringers (b) spandrel beams
(c) headers (d) trimmers

Q51. Out of all the available rolled steel sections the most commonly used sectiion as beam is

(a) L-section (b) T-section
(c) I-section (d) channel section

Q52. When the load is acting downward in a simply supported beam, the bending stress is

(a) maximum at the extreme fibre
(b) compressive above the neutral axis
(c) tensile above the neutral axis
(d) both (a) and (b)

Q53. The allowable shear stress in the web of mild steel beams decreases with

(a) Decrease in h/t ratio
(b) Increase in h/t ratio

(c) Decreases in thickness
(d) Increase in height

Q54. For cantilever beams built in at the support and free at the end, the effective length(l) will be equal to
(a) 0.85 x length of the beam
(b) length of the beam
(c) 2 x length of the beam
(d) 0.75 x length of the beam

Q55. For cantilever beam continuous at the support, unrestrained against torsion at the support and free the end, effective length will be equal to
(a) 0.85 x length of the beam.
(b) length of the beam
(c) 2 x length of the beam
(d) 3 x length of the beam

Q56. Bernoull's equation is derived making assumption that :
(a) The flow is uniform and incompressible.
(b) The flow is non viscous, uniform and steady.
(c) The flow is steady, incompressible,irrotational and the fluid is ideal.
(d) None of the above.

Q57. In the bernoulli's equation, used in pipe flow, each terms represents
(a)energy per unit mass
(b) energy per unit volume
(c)energy per unit flow length
(d) energy per unit weight

Q58.Cavitation occurs in a pipe flow when
(a) the pressure becomes negative
(b) the pressure is very high
(c) the pressure is equal to vapour pressure
(d) the fluid in the pipe is a gas

Q59.A vertical triangular gate has one side in a free surface, with vertex downwards. If the height of the gate is 'h', the depth of centre of pressure is
(a) h/3 (b)h/4 (d)h/2 (d)2h/3

Q60. The metacentric height of a floating body
(a) is the distance between the metacentre and the centre of buoyancy
(b) is the distance between the meta centre and centre of gravity
(c) does not control the stability of a floating body
(d) is the same about longitudinal and transverse axis

Q61. Gauge pressure is
(a) absolute pressure - atmospheric pressure
(b) absolute pressure + atmospheric pressure
(c) atmospheric pressure - absolute pressure
(d) none of these

Q62. The pressure drop per unit length of pipe in laminar flow is equal to
(a) $d^2/32\mu V$ (b) $32\mu VL/d^2$
(c) $32\mu V/d^2$ (d) $8\mu V/d^2$

Q63. An orifice is said to be large, if
(a) the size of orifice is large
(b) the velocity of flow is large
(c) $H > 5d_o$ (d) $H < 5d_o$

Q64. From below which instrument cannot be used for flow measurement in case of gases.
(a) Manometer (b) Differential U-tube manometer
(c) Pitot tube (d) all of the above

Q65. The velocity distribution of viscous fluid through a circular/pipe is
(a) hyperbolic(b)circular(c)parabolic(d)elliptical

Q66. The ratio of the inertia and gravitational force acting in any flow, ignoring other forces, is called
(a) Euler number (b) Froude number
(c) Reynold number (d) Weber number

Q67. An ideal flow of a liquid obeys
(a) Continuity equation
(b) Newton's law of viscosity
(c) Newton's second law of motion
(d) dynamic viscosity law

Q68. The time required to close a valve gradually is (where L is the length of pipe and C = velocity of pressure wave)
(a) 2L/C (b) < 2L/C
(c) > 2L/C (d) None of these

Q69. The unit of kinematic viscosity is
(a) $gm/cmsec^2$ (b) $dynesec/cm^2$
(c) gm/cm^2 sec (d) cm^2/sec

Q70. If the dynamic viscosity of a fluid is 0.5 poise and specific gravity is 0.5, then the kinematic viscosity of that fluid in stokes is
(a) 0.25 **(b) 0.50**
(c) 1.0 **(d) none of the above**

Q71. The viscosity of gas
(a) Decreases with increase in temperature
(b) Increases with increase in temperature
(c) Is independent of temperature
(d) Is independent of pressure for very high pressure intensities

Q72. A line that is traced by a fluid particle passing through a fixed point in a flow field, is known as
(a) Path line **(b) Stream line**
(c) Streak line **(d) None of the above**

Q73. Dynamic viscosity has the dimensions as
(a) MLT^{-2} **(b) $ML^{-1}T^{-1}$**
(c) $ML^{-1}T^{-2}$ **(d) $M^{-1}L^{-1}T^{-1}$**

Q74. Pascal's law states thatthe pressure and intensity of pressure at a point in a static fluid is equal in
(a) One direction **(c) All direction**
(b) Opposite direction **(d) none of the above**

Q75. Centre of buoyancy is
(a) Centroid of the floating body
(b) Centroid of the fluid displaced
(c) Centre of pressure of the displaced fluid
(d) none of these

Q76. Velocity distribution in the turbulent boundary layer is
(a) Asymptotic **(b) straight line**
(c) Logarthmic **(d) none of the above**

Q77. The sum of pressure head (p/w) and datum head is known as
(a) Total head **(b) Piezometric head**
(c) Bernoull's head **(d) Prandtl's head**

Q78. The non dimensional number influencing channel flow as critical or subcritical is
(a) Euler number **(c) Nusset number**
(b) Weber number **(d) Froude number**

Q79. In flow net, flow lines and equipotential lines
(a) Meet at right angle to one another
(b) Meet at any angle to one another
(c) Can meet one another at any angle
(d) Meet at 45 degree to one another

Q80. A rectangular tank 5 meters long and 2 meters wide contains water up to a depth of 2.5 meters. The pressure on the base of the tank would be
(a) 25 t **(b) 12.5t**
(c) 50t **(d) 37.5 t**

Q81. In bernoulli's equation, kinetic energy is represented by the term
(a) Z i.e head
(b) $V^2/2g$ where v is the velocity and g is gravitational acceleration.
(c) p/w where p is pressure and w is specific gravity
(d) none of the above.

Q82. The coefficient of discharge C_d in terms of C_v and C_c is
(a) Cd = Cv x Cc **(b) Cd = Cv/Cc**
(c) Cd = Cc / Cv **(d) Cd = 1 / (Cv.Cc)**

Q83. The condition of stable equilibrium for a floating body is
(a) The metacentre M coincides with the centre of Gravity G
(b) The metacentre M Is below centre of Gravity G
(c) The centre of buoyancy B is above centre of gravity
(d) The metacenter M is above centre of Gravity G

Q84. The hydraulic gradient line for flow through pipe is
(a) always above the total energy line
(b) always above the axis of the pipe
(c) always sloping in the direction of flow
(d) always below the total energy line

Q85.In laminar flow through a circular pipe, discharge, varies
(a) inversely as the viscosity
(b) Linearly as the viscosity
(c) inversely as the radius
(d)inversely as the pressure

Q86. The differential manometer is used to measure

(a) Atmospheric pressure
(b) Pressure in pipes
(c) Pressure in venturimeter
(d) Difference of pressure between two points in a pipe

Q87. Occurrence of flow under gravity through a circular pipe is the case of
(a) channel flow (b) Pipe flow
(c) Tube flow (d) Orifice flow

Q88. Poise is a unit of
(a) Mass density (b) Kinematic viscosity
(c) Viscosity (d) Velocity gradient

Q89. Vertical deflection limit for purlin supporting elastic cladding in industrial building is
(a) span/180 (b) span/200
(c) span/240 (d) span/150

Q90. Shear buckling of web in a plate girder is prevented by using
(a) vertical intermediate stiffener
(b) horizontal stiffener at neutral axis
(c) bearing stiffener (d) none of the above

Q91. The forces acting on the web splice of a plate girder are
(a) axial forces (b) shear and axial forces
(c) shear and bending forces
(d) axial and bending forces

Q92. Gantry girders are designed to resist
(a) lateral loads
(b) longitudinal loads and vertical loads
(c) lateral, longitudinal and vertical loads
(d) lateral and longitudinal loads

Q93. Generally the purlins are placed at the panel points so as to avoid
(a) axial force in rafter (b) shear force in rafter
(c) deflection of rafter
(d) bending moment in rafter

Q94. A compound curve consists of
(a) A single curve of circle connecting two straights
(b) Two arcs of different radii bending in the same direction
(c) Two arcs of equal radii bending in the same direction
(d) Two arcs of different or same radii bending in opposite direction

Q95. The additive constant for tacheometer is (f = focal length of the object, I = interval between stadia lines or hairs, d = horizontal distance from the optical centre to the vertical axis of the tacheometer)
(a) f/I (b) I/f
(c) f/d (d) f + d

Q96. Which is not the method of tacheometry
(a) Fixed hair method
(b) Movable hair method
(c) Tangential method
(d) Resection method

Q97. The error which remains of same size and sign under the same condition is called
(a) Mistakes
(b) Compensating error
(c) Systematic error
(d) Accidental error

Q98. Minimum number of satellites required to locate a point using GPS are
(a) 1 (b) 2
(c) 3 (d) 4

Q99. The intersection of camera axis with either picture plane or camera plate is called
(a) Principal point (b) Focal length
(b) Nodal point (d) Nadir point

Q100. Which of the following variations of magnetic declination are correctly matched?
1. Diurnal variation…..variation whose time period varies from 100 – 300 years
2. Annual variation…..Annual rate of change of secular variation
3. Secular variation…. Variation of declination periodic in character
4. Irregular variation….. caused due to magnetic storms in earth's magnetic field

Select the correct answer using the codes given below:
(a) 1,3 and 4 (b) 2 and 3
(c) 1 and 3 (d) 3 and 4