ISRO

Previous Year Paper
Scientist Civil 2019

80 Questions

Que. 1   In a standard penetration test (SPT) for soil, the SPT number is

1. Penetration depth of sampler in the soil for any given number of blows
2. Number of blows required for 30 cms of penetration of sampler in the soil
3. Number of blows required for 20 cms of penetration of sampler in the soil
4. None of the above

Correct Option - **2**

Que. 2   In the Indian standard classification system of soils,

1. The soils are divided into three major divisions i.e Coarse grained, Fine grained and Highly organic soils
2. The soils are classified based on mineralogical composition
3. The soils are classified based on particle size with or without consistency limits
4. The soils are classified as A1 to A7 based on stability of soils under vehicular load

Correct Option - **1**

Que. 3   Piles used to resist uplift forces are known as

1. Bearing piles
2. Friction piles
3. Anchor piles
4. Batter piles

Correct Option - **3**

Que. 4   The cyclic plate load test in soils can be adopted to determine the

1. Consolidation characteristics of soils
2. Dynamic shear modulus of the soil
3. Permeability characteristics of the soil
4. None of the above

Correct Option - **2**

Que. 5   Expansion joint in concrete is a type of

1. Construction Joint
2. Temporary joint
3. Movement joint
4. Locking joint

Correct Option - **3**

Que. 6   The measurement of workability for a tremie concrete will be appropriate by determination of its.

1. Flow
2. Compacting factor
3. Slump
4. None of the above

Correct Option - **1**

Que. 7 When the depth of the web in an R.C.C T- beam exceeds _____ side face reinforcement shall be provided

1. 750 mm
2. 600 mm
3. 500 mm
4. 350 mm

Correct Option - **1**

Que. 8 In the case of a continuous beam, if the width of the support is less than $1/12^{th}$ of the clear span, then effective span shall be calculate as

1. Centre to centre of support
2. Clear span plus effective depth
3. Clear span plus effective depth or centre to centre of support whichever is less
4. Clear span plus effective depth or centre to centre of support whichever is more

Correct Option - **3**

Que. 9 In an under reinforced R.C.C beam section, the actual neutral axis fall ____ the critical neutral axis of the balanced section

1. Below
2. Above
3. At
4. None of the above

Correct Option - **2**

Que. 10 The fineness modulus of aggregates approximately

1. Is directly proportional to the average size of the particles
2. Is inversely proportional to the average size of the particles
3. Indicates the water absorption of the aggregates
4. Indicates the modulus of elasticity of the aggregates

Correct Option - **1**

Que. 11 The minimum content of cement specified by IS 456 – 2000 for adoption in concrete work normal weight aggregate of 20 mm nominal maximum size is

1. Independent of exposure conditions
2. Independent of grade of cement used
3. Independent of type of concrete i.e plain or reinforced concrete
4. None of the above

Correct Option - **2**

Que. 12 In normal circumstances where ambient temperature does not fall below 15°C, for a properly cured reinforced concrete slabs spanning up to 4.5 metre span cast using ordinary Portland cement, the props provide can be removed only after a minimum period of

1. 3 days

2. 7 days
3. 14 days s
4. 21 days

Correct Option - **2**

Que. 13 The representative fraction 1/5000 means that the scale is
1. 1 cm = 0.50 metre
2. 1 cm = 5.0 metre
3. 1 cm = 50 metre
4. 1 cm = 500 metre

Correct Option - **3**

Que. 14 In the plastic analysis, the ratio of plastic moment M_P to the yield moment M_Y is called
1. Plastic hinge
2. Shape factor
3. Load factor
4. Plastic strain

Correct Option - **2**

Que. 15 Two parallel railway lines are to be connected by a reverse curve, each section of the curve having the same radius, If the centre line are 8 metre apart and maximum distance between the tangent points is 32 metre, the maximum allowable radius of the curves will be
1. 4 metre
2. 8 metre
3. 32 metre
4. 48 metre

Correct Option - **3**

Que. 16 The two steel long columns P of length L and Q of length 2L have the same cross section, strength characteristics and end conditions. The ratio of buckling load of column P to that of column Q is
1. 0.5
2. 1.0
3. 2.0
4. 4.0

Correct Option - **4**

Que. 17 For a given soil mass with water content of 15 % the void ratio is 0.55 and specific gravity of soil particles is 2.6. The degree of saturation of soil is
1. 45.60
2. 70.90
3. 55.80
4. 90.20

Correct Option - **2**

Que. 18 Match the dimensionless parameters in Group – I with the corresponding ratio In Group – II

Group II	Group – II
P. Mach number	1. Ratio of inertia force and gravitational force
Q. Reynolds number	2. Ratio of fluid velocity and velocity of sound
R. Weber number	3. Ratio of inertia force and viscous force
S. Froude number	4 Ratio of inertia force and surface tension force

1. P -3, Q – 3, R – 4, S – 1
2. P -3, Q – 4, R – 2, S – 1
3. P – 2, Q – 3, R – 4, S – 1
4. P – 1, Q – 3, R – 3, S – 4

Correct Option **- 3**

Que. 19 An isohyet is a line joining points of

1. equal temperature
2. equal humidity
3. equal rainfall depth
4. equal evaporation

Correct Option **- 3**

Que. 20 The strength parameter of concrete used in design of plain jointed cement concrete pavement is

1. Flexural strength
2. Compressive strength
3. Tensile strength
4. Shear strength

Correct Option **- 1**

Que. 21 The shingle is a

1. Air weathered rock
2. Crushed granite
3. water bound pebbles
4. Decomposed laterite

Correct Option **- 3**

Que. 22 Bulking of sand is caused due to

1. Clay contents
2. Air voids
3. Viscosity
4. Surface moisture

Correct Option **- 4**

Que. 23 The refractory bricks are used primarily to resist

1. High temperature

2. High pressure

3. Dampness

4. None of the above

Correct Option **- 1**

Que. 24 The seasoning of timber is done for

1. Increasing moisture content

2. Decreasing moisture content

3. Reducing knots

4. Determining age of the timber

Correct Option **- 2**

Que. 25 The ornamental moulded course placed on the top of a wall is called

1. Cornice

2. Frieze

3. Coping

4. Lintel

Correct Option **- 1**

Que. 26 The type of truss suitable for a span of about 3 metre is

1. Fink truss

2. King post truss

3. Howe truss

4. None of the above

Correct Option **- 2**

Que. 27 The unit of strain is

1. that of shear

2. that of force

3. that of deformation in length

4. dimensionless

Correct Option **- 4**

Que. 28 A steel bar of 8 mm is heated from 10° C to 25° C and the bar is free to expand. The bar will induce

1. Tensile stress

2. No stress

3. Compressive stress

4. Shear stress

Correct Option **- 2**

Que. 29 Modulus of rigidity is defined as the ratio of _____.

1. Longitudinal stress and longitudinal strain

2. Volumetric stress and volumetric strain

3.   Lateral stress and lateral strain

4.   Shear stress and shear strain

Correct Option - **4**

| Que. 30 | A body is subjected to a direct tensile stress of 400 MPa in one plane accompanied by a simple shear stress of 150 MPa. The maximum normal stress will be |

1.   -100 MPa

2.   150 MPa

3.   450 MPa

4.   550 MPa

Correct Option - **3**

| Que. 31 | The stress in a body due to suddenly applied load compared to when it is applied gradually is _____. |

1.   Same

2.   Half

3.   Two times

4.   Four times

Correct Option - **3**

| Que. 32 | Two beams A and B of equal span carries same central point load. Beam 'A' has fixed end supports and Beam 'B' has simply supported ends. The deflection of Beam 'A' will be _____ as compared to that of Beam 'B'. |

1.   One eighth

2.   One fourth

3.   One half

4.   Double

Correct Option - **2**

| Que. 33 | The maximum bending moment of cantilever beam of length L and carrying a gradually varying load from zero at free end to 'w' per unit length at the fixed end is _____ |

1.   wL/2

2.   wL

3. $wL^2/2$

4. $wL^2/6$

Correct Option - **4**

| Que. 34 | A pipeline of 300 mm diameter carrying water at an average velocity of 5 metre/sec branches into two pipes of 150 mm and 200 diameter. The total flow rate of discharge of water in the system is |

1.   58 litres/sec

2.   132 litres/sec

3.   353 litres/sec

4.   832 litres/sec

Correct Option - **3**

Que. 35 The metacentric height is the distance between the

1. Centre of gravity of the floating body and the centre of buoyancy
2. Centre of gravity of the floating body and the metacentre
3. Metacentre and the centre of buoyancy
4. Original centre of buoyancy and new centre of buoyancy

Correct Option **- 2**

Que. 36 The hydraulic radius of a circular pipe flowing full and having a diameter of 300 mm is

1. 50 mm
2. 75 mm
3. 150 mm
4. 300 mm

Correct Option **- 2**

Que. 37 Stoke is the unit of

1. Kinematic viscosity in C.G.S units
2. Dynamic viscosity in M.K.S units
3. Kinematic viscosity M.K.S units
4. Dynamic viscosity in S.I units

Correct Option **- 1**

Que. 38 The shear stress-strain graph for a Newtonian fluid is a

1. Straight line
2. Parabolic Curve
3. Hyperbolic Curve
4. Elliptical

Correct Option **- 1**

Que. 39 When the water in a channel is flowing at critical velocity

1. Specific energy will be maximum
2. Specific energy will be minimum
3. Critical depth will be zero
4. None of the above

Correct Option **- 2**

Que. 40 While surveying a plot of land by the method of plane tabling, the field observations

1. And plotting processed simultaneously
2. And plotting do not processed simultaneously
3. Are recorded in field books to be plotted later
4. All the above

Correct Option **- 1**

Que. 41 During levelling operations, if the back sight is more than the fore sight, then it indicates that

1. The forward staff is at lower point

2. The back staff is lower point
3. The difference in level cannot be ascertained
4. None of the above

Correct Option **- 2**

Que. 42 If the whole circle bearing of a line is 180° then its reduced bearing is

1. N 0° W
2. S 0° E
3. S
4. N

Correct Option **- 3**

Que. 43 The area of any irregular figure of the plotted map is measured with

1. Planimeter
2. Clinometers
3. Optical square
4. Pentanraph

Correct Option **- 1**

Que. 44 The horizontal angle between the true meridian and the magnetic meridian is

1. True bearing
2. Dip
3. Magnetic inclination
4. Magnetic declination

Correct Option **- 4**

Que. 45 If bearing of line XY and XZ are 26°10' and 298°45', the value of included angle ZXY is

1. 87° 25'
2. 156° 55'
3. 272° 35'
4. 325° 55'

Correct Option **- 1**

Que. 46 While measuring the distance between the two points, if L is in kilometres, the correction for curvature of earth is

1. $48.3 \, L^2$ mm
2. $55.2 \, L^2$ mm
3. $62.4 \, L^2$ mm
4. $78.4 \, L^2$ mm

Correct Option **- 4**

Que. 47 The unit of measurement of inertia of mass is

1. Kg/sq meter
2. Kg/metre

3. Kg.sq metre
4. Cubic metre

Correct Option - **3**

Que. 48 To double the period of oscillation of a simple pendulum with small swings
1. Its length should be quadrupled
2. The mass of the bob should be quadrupled
3. Its length should be doubled
4. The mass of the bob should be doubled

Correct Option - **1**

Que. 49 The vertical distance between the springing line and the highest point on the intrados is called_____of the arch.
1. Depth
2. Extrados
3. Haunch
4. Rise

Correct Option - **4**

Que. 50 An artesian spring is formed
1. When an aquiclude gets exposed in a valley against a vertical cut
2. Due to the presence of a continuous fault in a rock
3. When a porous strata gets confined between two impervious strata
4. None of the above

Correct Option - **3**

Que. 51 The finely divided dispersion of solid particles in water which are not visible to the naked eye and cannot be removed by ordinary filters are known as
1. Suspended impurities
2. Colloidal impurities
3. Dissolved impurities
4. None of the above

Correct Option - **2**

Que. 52 According to Indian standards, the consumption of water per capita per day for nursing homes, boarding schools and hostels in
1. 85 liters
2. 100 liters
3. 115 liters
4. 135 liters

Correct Option - **4**

Que. 53 If the depletion of the oxygen is found to be 3 mg/ liter after incubating 5 ml of sewage diluted to 250 ml for 5 days at 20° C, B.O.D of the sewage is
1. 150 mg/litre

2. 250 mg/litre

3. 350 mg/litre

4. 40 mg/llitre

Correct Option - **1**

Que. 54 In sewers designed with self cleansing velocity.

1. The bottom is silted

2. The bottom is scoured

3. Both silting and scorning occur at the bottom

4. Neither silting nor scouring occur at the bottom

Correct Option - **4**

Que. 55 The sewage treatment units in which biological decomposition of organic matter takes place are called

1. Sludge sedimentation tanks

2. Trickling filters

3. Imhoff tanks

4. Both 2) and 3)

Correct Option - **4**

Que. 56 A dry soil sample weighing 120 g has a volume of 80 ml and specific gravity 2.7 Its voids ratio is

1. 0.5

2. 0.6

3. 0.7

4. 0.8

Correct Option - **4**

Que. 57 The property of a soil which enables to regain part of its strength lost on remoulding in a short time, without change of moisture content, is called

1. Sensitivity

2. Unconfined compressive strength

3. Thixotropy

4. Relative density

Correct Option - **3**

Que. 58 The coefficient of passive and active earth pressure for a loose sand having an angle of internal friction of 30° is

1. 1/2, 2

2. 2, 1/2

3. 1/3, 3

4. 3, 1/3

Correct Option - **4**

Que. 59 When the water table is under the base of the footing at a depth equal to half of the width of the footing, the bearing capacity of the soil is reduced to its

1. One-fourth
2. One-half
3. Three-fourth
4. None of the above

Correct Option - **3**

Que. 60 The cement concrete from which entrained air and excess water are removed after placing it in position is called

1. Light weight concrete
2. Prestressed concrete
3. Air entrained concrete
4. Vacuum concrete

Correct Option - **4**

Que. 61 Efflorescence in cement is caused due to the excess of
1. Silica
2. Lime
3. Iron oxide
4. Alkalies

Correct Option - **4**

Que. 62 The average shear stress for structural steel rolled beams is calculated by dividing the shear force at the cross-section be the
1. Gross sectional area of the beam
2. Depth of beam
3. Gross sectional area of web
4. Width of flange

Correct Option - **3**

Que. 63 Web crippling in steel beam occurs due to:
1. Column action of compression flange
2. Failure of web under concentrated load
3. Excessive bending moment
4. Secondary bending moment

Correct Option - **2**

Que. 64 PERT stands for
1. Project Evaluation and Review Technique
2. Project Evaluation and Reporting Technique
3. Process Execution and Reporting Technique
4. Project Execution and Results Technique

Correct Option - **1**

Que. 65 As per mohr's scale the hardness of quartz and topaz respectively are
1. 7 & 8

2. 8 & 7

3. 9 & 10

4. 10 & 9

Correct Option **- 1**

Que. 66 The whole period of cultivation from the time when irrigation water is first supplied for preparation of the ground at the time of sowing to its last watering before harvesting is called

1. Base period

2. Growth period

3. Kor period

4. None of the above

Correct Option **- 1**

Que. 67 If the crop rice requires about 10 cms depth of water at an average interval of about 10 days and the crop period of the rice is 110 days, the delta for the crop rice will be

1. 10 cms

2. 50 cms

3. 68 cms

4. 110 cms

Correct Option **- 4**

Que. 68 A barrel camber for highway consists of

1.   Two straight slopes with a parabolic crown in the centre

2. A continuous curve either parabolic or elliptical

3. Two straight slopes joining at the centre

4. None of the above

Correct Option **- 2**

Que. 69 Creep of rails can be checked by using

1.   Chairs

2. Bearing plates

3. Spikes

4. Anchors

Correct Option **- 4**

Que. 70 The formation width of a highway with no transverse slope on an embankment is B. The height of the embankment is d and side slope of the embankment is S: 1 The area of cross-section of the embankment is

1. $B + d + S \times d$

2. $B \times D + S \times d$

3. $B \times d + S \times d^2$

4. $\frac{1}{2}\left(B \times d + Sd^2\right)$

Correct Option **- 3**

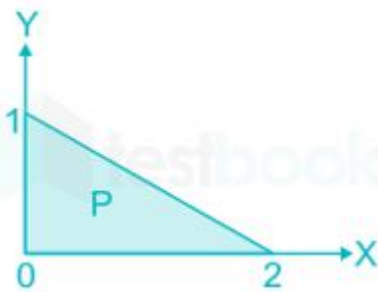
Que. 71

Equation of the line normal to function $f(x) = (4-x)^{\frac{1}{2}} + 1$ at Q(0,3) is

1. y = 3 – 4x
2. y = 3 + 4x
3. 4y = 12 - x
4. 4y = 12 + x

Correct Option - **2**

Que. 72 Consider the shaded triangular region P shown in the figure. What is $\iint\limits_{P} xy\, dx\, dy$?

1. 1/6
2. 2/9
3. 7/16
4. 1

Correct Option - **1**

Que. 73 The distance between the origin and the point nearest to it on the surface $z^2 = 1 + xy$ is

1. 1
2. $\frac{\sqrt{3}}{2}$
3. √3
4. 2

Correct Option - **1**

Que. 74 At x = 0, the function f(x) = |x| has

1. A minimum
2. A maximum
3. A point of inflexion
4. neither a maximum nor minimum

Correct Option - **1**

Que. 75 The general solution of the differential equation $\frac{dy}{dx} = \cos(x+y)$, with c as a constant, is

1. $\tan\left(\frac{x+y}{2}\right) = y + c$
2. $\sin\left(\frac{x+y}{2}\right) = y + c$
3. $\cos\left(\frac{x+y}{2}\right) = x + c$
4. $\tan\left(\frac{x+y}{2}\right) = x + c$

Correct Option - **4**

Que. 76 A box contains 2 blue, 3 black and 4 red balls. Balls are drawn from the box at random one at a time without replacement. The probability of drawing 2 blue balls first followed by 3 black balls and subsequently 4 red balls is

1. 2/350
2. 1/629
3. 1/1260
4. 1/24

Correct Option - **3**

Que. 77 Using the trapezoidal rule, and dividing the interval of integration into three equal subintervals, the definite integral $\int\limits_{-1}^{+1} |x|\,dx$ is _____

1. 1.11
2. 2.22
3. 3.33
4. 4.44

Correct Option - **1**

Que. 78 A circular ring of radius 42 cm is cut and bent into the form of a rectangle whose sides are in the ratio of 6 : 5. The small side of the rectangle is

1. 80 cm
2. 30 cm
3. 120 cm
4. 60 cm

Correct Option - **4**

Que. 79 A tank is normally filled in 8 hours but takes 2 hours longer to fill because of a leak at the bottom. If the tank is full and due to leakage alone, the tank will get empty in _____ hours (Assume no further filling happens)

1. 20
2. 40
3. 30
4. 50

Correct Option - **2**

Que. 80 From a circular sheet of paper having radius 50 cm, a sector of 40% area is removed in the shape of an arc section. If the remaining part is used to make a conical surface, then the ratio of the radius to height of the cone is

1. $\frac{4}{3}$
2. $\frac{5}{4}$
3. $\frac{3}{4}$
4. $\frac{7}{8}$

Correct Option - **3**