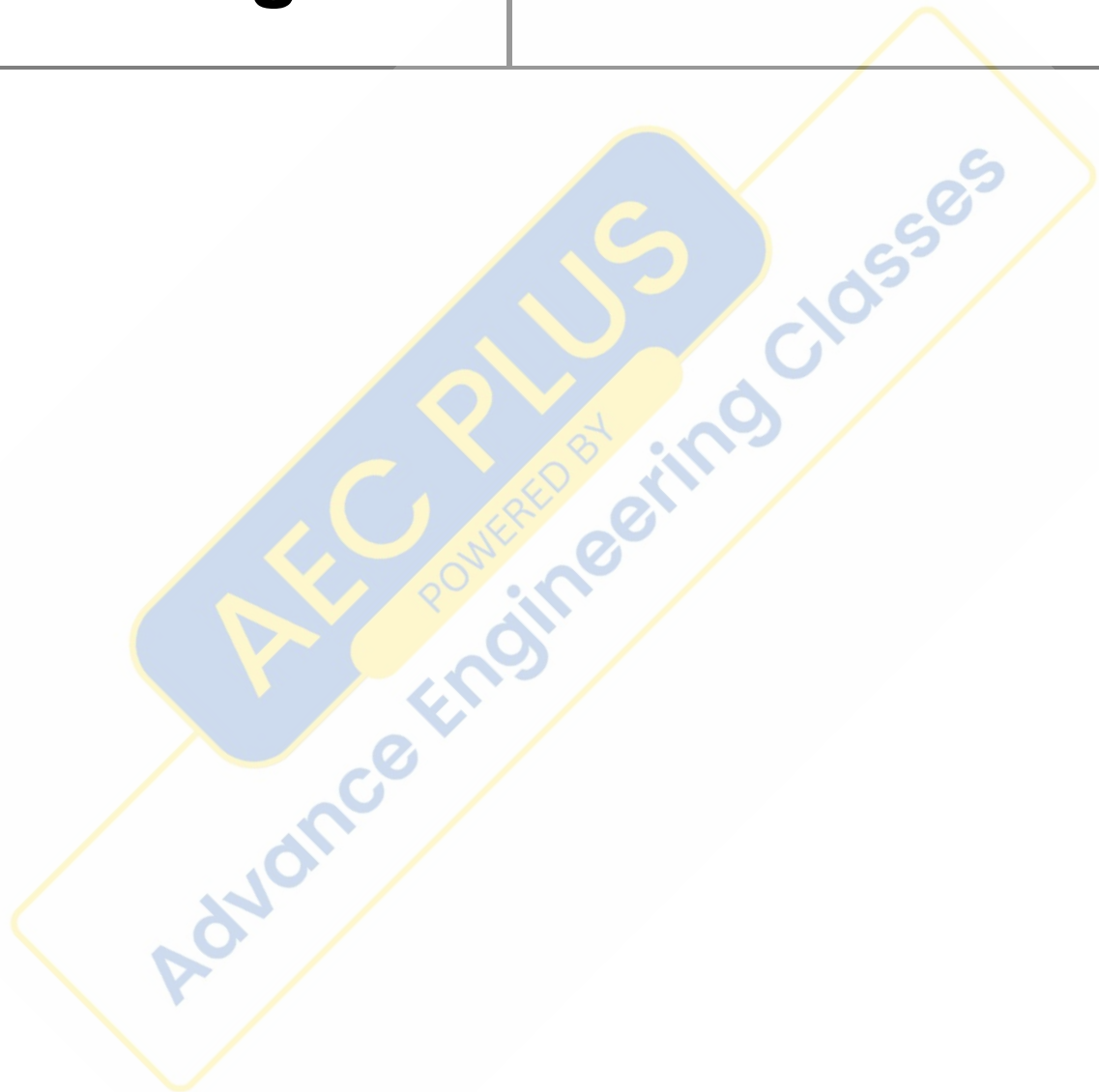


LMRC Junior Engineer

Previous Year Paper
(Civil) 20 Jan 2020 Shift 1





Uttar Pradesh Metro Rail Corporation Limited

उत्तर प्रदेश मेट्रो रेल कॉर्पोरेशन लिमिटेड

A joint Venture of Govt. of India and Govt. of Uttar Pradesh

Participants Id	
Participant Name	
Test Center Name	
Test Date	20/01/2020
Test Time	9:00 AM - 11:00 AM
Subject	NE 01 Jr Engineer (Civil)

Section : Technical

Q.1 The process of compaction of soil involves:

- Ans
- 1. expulsion of air and water from the soil
 - 2. expulsion of water only from the soil
 - 3. reducing the dry density of soil by tamping, rolling or vibration of soil
 - 4. expulsion of air only from the soil

Question ID : 931207194
Chosen Option : 4

Q.2 In a plane table survey, scale selected is 1 cm = 100 m. If area plotted on the sheet is 200 cm², how much is the actual area on field?

- Ans
- 1. 0.2 km²
 - 2. 50000 m²
 - 3. 20 km²
 - 4. 2000000 m²

Question ID : 931207164
Chosen Option : 4

Q.3 If the surface tension at air-water interface is 0.07N/m, then the pressure difference between the inside and outside of an air bubble of diameter 0.02 mm will be:

- Ans
- 1. 28 kPa
 - 2. 0.09 kPa
 - 3. 14 kPa
 - 4. 35 kPa

Question ID : 931207202
Chosen Option : 3

Q.4 Using Rankine's formula, what is the minimum depth of foundation, if safe bearing capacity of soil is 90 kN/m^2 and

unit weight 18 kN/m^3 ? Take $\sin \phi = \frac{1}{3}$.

Where ϕ is angle of repose.

- Ans
- 1. 1.25 m
 - 2. 1.5 m
 - 3. 1.0 m
 - 4. 0.8 m

Question ID : 931207197
Chosen Option : --

Q.5 In the rainy season it has to carry combined discharge to its maximum capacity and in summer it may be even be 5 to 10 % of the maximum, which of the following types of sewer will be most suitable?

- Ans
- 1. Rectangular
 - 2. Egg shaped
 - 3. Circular
 - 4. Semi circular

Question ID : 931207228
Chosen Option : 3

Q.6 Self-cleansing velocity should be maintained at least once in _____.

- Ans
- 1. a month
 - 2. a day
 - 3. a week
 - 4. 8 hours

Question ID : 931207223
Chosen Option : 2

Q.7 In a tacheometer, stadia hairs are located on the:

- Ans
- 1. stadia rod
 - 2. diaphragm
 - 3. object glass
 - 4. eye piece

Question ID : 931207170
Chosen Option : 4

Q.8 The unit of viscosity is:

- Ans
- 1. poise
 - 2. cumecs
 - 3. m/s
 - 4. N/m

Question ID : 931207201
Chosen Option : 1

Q.9 Which of the following statements is/are true about settlements continuing to occur at an appreciable rate after many years for a building founded above thick clay strata?

- i. Low permeability of clay and consequent time required for the escape of pore water.
- ii. Plastic action in absorbed water near grain to grain contacts, which does not allow quick transmission of the applied stress to the grains and the effective stress to reach a constant value.
- iii. Effective stress in the soil at any point is decreased by an amount equal to the seepage force for the downward flow.

- Ans
- 1. ii is true
 - 2. i is true
 - 3. i and ii both are true
 - 4. ii and iii both are true

Question ID : 931207180
Chosen Option : 4

Q.10 Which of the following is/are NOT true about Plane Surveying?

- i. Effect of curvature of the earth is neglected assuming the earth's surface to be plane.
- ii. Effect of curvature of the earth is taken into account.
- iii. Generally suitable for area more than 500 km².
- iv. Degree of accuracy is low.

- Ans
- 1. ii and iv are not true
 - 2. ii and iii are not true
 - 3. i and iv are not true
 - 4. i and iii are not true

Question ID : 931207156
Chosen Option : 2

Q.11 If reduced bearing of a line is $N23^{\circ} 20' W$, then what will be the whole circle bearing?

- Ans
- 1. $336^{\circ} 40'$
 - 2. $N336^{\circ} 40' W$
 - 3. $N23^{\circ} 20' W$
 - 4. $156^{\circ} 40'$

Question ID : 931207162
Chosen Option : 1

Q.12 _____ is a kind of passage to allow water from upstream to downstream of a dam which has flood gates to control the flow.

- Ans
- 1. Flume
 - 2. Gallery
 - 3. Spillway
 - 4. Sluiceway

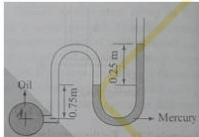
Question ID : 931207209
Chosen Option : 3

Q.13 Which of the following is INCORRECT about Piezometer?

- Ans
- 1. It is a simple form of manometer
 - 2. It can be used to measure the positive gauge pressures of a liquid
 - 3. It can be used to measure gas pressure
 - 4. It can be used to measure pressure of a moving liquid

Question ID : 931207206
Chosen Option : 3

Q.14 The figure below shows a manometer connected to a pipeline containing oil of specific gravity 0.8. If the specific gravity of mercury is 13.6, the pressure of oil in terms of height of the water will be:



- Ans
- 1. 5 m
 - 2. 4m
 - 3. 1m
 - 4. 3.2 m

Question ID : 931207205
Chosen Option : --

Q.15 True bearing of station A when observed from station M was 210° and magnetic bearing of A was found to be 238° . The magnetic bearing of another line MN was 126° . What is the true bearing of line MN?

- Ans
- 1. 28°
 - 2. 176°
 - 3. 154°
 - 4. 98°

Question ID : 931207163
Chosen Option : 3

Q.16 The flow in a pipe is laminar if:

- Ans
- 1. Reynolds number is less than 2000
 - 2. Reynolds number is between 2000 and 4000
 - 3. Reynolds number is more than 6000
 - 4. Reynolds number is more than 4000

Question ID : 931207211
Chosen Option : 1

Q.17 A vertical separator partition is hinged at the base. If oil of unit weight 9 kN/m^3 is stored to a height of h_1 m on one side and the height of water stored on other side is h_2 m that maintains the separator in a vertical position, then the ratio of h_1 to h_2 will be:

- Ans
- 1. 1 : 3
 - 2. $\sqrt[3]{9} : \sqrt[3]{10}$
 - 3. $\sqrt[3]{100} : \sqrt[3]{81}$
 - 4. $\sqrt[3]{10} : \sqrt[3]{9}$

Question ID : 931207204
Chosen Option : 4

Q.18 In a 1250 cm^3 soil sample, 10 cm^3 is volume of voids in which 3 cm^3 is volume of air voids. The degree of saturation will be:

- Ans
- 1. 70%
 - 2. 30%
 - 3. 12.5%
 - 4. 40%

Question ID : 931207182
Chosen Option : 1

Q.19 The arbitrary limit of water content at which the soil tends to pass from the semi-solid to solid state is called:

- Ans
- 1. plastic limit
 - 2. shrinkage limit
 - 3. plasticity index
 - 4. liquid limit

Question ID : 931207176
Chosen Option : 2

Q.20 The vertical distance between the centreline of the centrifugal pump and the liquid surface in the pump is called as:

- Ans
- 1. dynamic head
 - 2. manometric head
 - 3. delivery head
 - 4. Suction head

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Question ID : 931207214
Chosen Option : 4

Q.21 The permissible limits for pH of drinking water must be:

- Ans
- 1. 1 to 14
 - 2. 1 to 7
 - 3. 6.5 to 8.5
 - 4. 7 to 8

Question ID : 931207216
Chosen Option : 4

Q.22 Seasoning of timber does NOT increases its:

- Ans
- 1. strength
 - 2. durability
 - 3. stiffness
 - 4. self-weight

Question ID : 931207155
Chosen Option : 4

Q.23 Which of the following statements is INCORRECT about asbestos?

- Ans
1. It is an excellent insulator for electricity
 2. It is porous
 3. It is an excellent insulator for heat
 4. It is fire proof

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

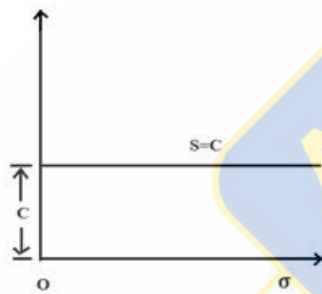
Question ID : 931207147
Chosen Option : 1

Q.24 A metallic tape originally 20m is now found to be 20.2m long. Two points on the ground are to be marked 50m apart. What measurement must be made using this tape?

- Ans
1. 51.505 m
 2. 49.200 m
 3. 50.000 m
 4. 49.505 m

Question ID : 931207158
Chosen Option : 4

Q.25 If Coulomb's envelop takes the shape as shown in the figure, it must be:



- Ans
1. sandy soil
 2. pure clay
 3. either sandy soil or pure clay
 4. $c-\phi$ soil

Question ID : 931207187
Chosen Option : 1

Q.26 Autoclave test on cement is done to know:

- Ans
- 1. permeability of cement
 - 2. specific gravity of cement
 - 3. soundness of cement
 - 4. fineness of cement

Question ID : 931207143
Chosen Option : 3

Q.27 Which of the following is NOT correct with reference to Terzaghi's theory of one-dimensional consolidation?

- Ans
- 1. The compression is one-dimensional
 - 2. Soil is non-homogeneous
 - 3. Flow of water in the soil voids is one-dimensional
 - 4. Soil is completely saturated

Question ID : 931207179
Chosen Option : 2

Q.28 In which of the following is compass surveying NOT advisable?

- Ans
- 1. Survey of long narrow strips of roads, railways etc.
 - 2. When the area under survey cannot be divided into triangles conveniently.
 - 3. Where long straight lines and convenient tie lines cannot be drawn on account of obstructions.
 - 4. In places abounding in magnetic rock or iron ore.

Question ID : 931207160
Chosen Option : 4

Q.29 $\frac{A \cdot L \cdot N}{60}$ Q = cumecs is an equation for discharge, where, A is a cross-sectional area of cylinder / piston, L is the stroke length of the piston and N is the rpm of the crank.

- Ans
- 1. A single acting reciprocating pump
 - 2. A double acting reciprocating pump
 - 3. Triple cylinder pump
 - 4. Diffuser pump

Question ID : 931207213
Chosen Option : --

Q.30 How much shall be the compressive strength of OPC 53 Grade cement after 28 days of curing?

- Ans
- 1. 53 MPa
 - 2. 63 MPa
 - 3. 33 MPa
 - 4. 43 MPa

Question ID : 931207151
Chosen Option : 1

Q.31 In a laboratory soil test, the sample has an area of cross section 12.50 cm^2 , hydraulic gradient is 2 and discharge measured is 150 ml in 120 sec. The coefficient of permeability will be _____. (Apply Darcy's law)

- Ans
- 1. 0.5 mm/s
 - 2. 0.2 mm/s
 - 3. 5.0 mm/s
 - 4. 0.1 mm/s

Question ID : 931207178
Chosen Option : 1

Q.32 The Vane Shear Test is suitable for:

- Ans
- 1. sandy soil
 - 2. gravely soil
 - 3. cohesion-less soil
 - 4. clay

Question ID : 931207192
Chosen Option : 4

Q.33 In Bernoulli's equation, Total head =?

- Ans
- 1. Pressure head - Kinetic head + Potential head
 - 2. Pressure head + Kinetic head - Potential head
 - 3. Pressure head + Kinetic head + Potential head
 - 4. Pressure head - Kinetic head - Potential head

Question ID : 931207208
Chosen Option : 3

Q.34 A centrifugal pump having a wheel of π^{-1} m outside diameter rotates at 1200 rpm. The vanes are radial at exit and the velocity of water in the delivery pipe is 5m/s. What is the height through which the pump lifts the water? Neglect frictional losses and consider $g = 10 \text{ m/s}^2$.

- Ans**
- 1. 25.00 m
 - 2. 38.75 m
 - 3. 22.30 m
 - 4. 12.38 m

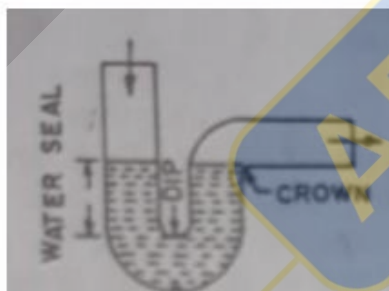
Question ID : 931207215
Chosen Option : --

Q.35 Sometimes while surveying a small area, the direction of survey lines are expressed in terms of the angle between a fixed reference line or convenient direction at site. This fixed reference line or convenient direction at site is called as:

- Ans**
- 1. geographical meridian
 - 2. arbitrary meridian
 - 3. grid meridian
 - 4. true meridian

Question ID : 931207159
Chosen Option : 3

Q.36 The given figure is an example of a _____.



- Ans**
- 1. P-trap
 - 2. Q-trap
 - 3. half-S-trap
 - 4. S-trap

Question ID : 931207230
Chosen Option : 1

Q.37 Which of the following is NOT a sewage appurtenances?

- Ans
- 1. Manhole
 - 2. Inverted siphon
 - 3. Trickling filter
 - 4. Catch basins

Question ID : 931207229
Chosen Option : 3

Q.38 Chlorine usage in the treatment of $25000 \text{ m}^3/\text{day}$ is 9 kg. The dosage in milligram per litre is:

- Ans
- 1. 0.0028
 - 2. 0.36
 - 3. 360
 - 4. 2.778

Question ID : 931207218
Chosen Option : 4

Q.39 In a residential district, for water to be supplied up to 5 storey height, the pressure in the distribution main must be:

- Ans
- 1. 5.5 to 7 kg/cm^2
 - 2. up to 1.2 kg/cm^2
 - 3. 1.2 to 2 kg/cm^2
 - 4. 2 to 4 kg/cm^2

Question ID : 931207219
Chosen Option : 4

Q.40 In levelling between two points A and B on opposite banks of a river, the instrument was set up near A and the staff readings on A and B were 2.107 and 3.335 respectively. The instrument was then moved and set up near B and the respective staff reading on A and B were 1.934 and 3.076 respectively. What is the true difference of level of A and B?

- Ans
- 1. 2.613 m
 - 2. 1.128 m
 - 3. 0.216 m
 - 4. 1.185 m

Question ID : 931207166
Chosen Option : 4

Q.41 For distribution of water the main pipe line runs through the centre of the populated area, sub-mains take-off from it to both sides, which divide into several branch lines. This is a:

- Ans**
- 1. reticulation system
 - 2. dead end system
 - 3. ring system
 - 4. radial system

Question ID : 931207221
Chosen Option : 4

Q.42 The horizontal distance between two consecutive contours is termed as _____.

- Ans**
- 1. contour equivalent
 - 2. horizontal interval
 - 3. contour interval
 - 4. horizontal equivalent

Question ID : 931207168
Chosen Option : 2

Q.43 Which of the following is a correct statement with reference to determining reduced level of a point using rise and fall method?

- Ans**
- 1.
If a staff reading (fore reading) is greater than that at the preceding point, then there is a fall and if smaller then there is a rise.
 - 2.
If reading of a preceding point is greater, then there is a fall.
 - 3.
If a staff reading (fore reading) is greater than that at the preceding point, then there is a rise.
 - 4.
If a staff reading (fore reading) is smaller than that at the preceding point, then there is a fall and if greater then there is a rise.

Question ID : 931207165
Chosen Option : 4

Q.44 Which of the following tests is NOT conducted on limestone?

- Ans**
- 1. Stud pull-off test
 - 2. Heat test
 - 3. Acid test
 - 4. Ball test

Question ID : 931207149
Chosen Option : 4

Q.45 The ratio of pH to pOH of freshly distilled water will be:

- Ans
- 1. 1.2
 - 2. 0.5
 - 3. 2
 - 4. 1

Question ID : 931207217
Chosen Option : 4

Q.46 The time needed to complete BOD and COD tests on wastewater is _____ respectively.

- Ans
- 1. 5 days and 3 hours
 - 2. 5 days and 3 days
 - 3. 3 days and 5 hours
 - 4. 5 hours and 3 hours

Question ID : 931207226
Chosen Option : 1

Q.47 In a Plate Load Test, after every increment in load on plate, settlements are recorded till the settlement is less than _____ and thereafter the load is increased and the test is continued until a load of about _____ times the anticipated ultimate load is applied.

- Ans
- 1. 0.01 mm/ hour, 2
 - 2. 0.02 mm/ hour, 2
 - 3. 0.01 mm/ hour, 1.5
 - 4. 0.02 mm/ hour, 1.5

Question ID : 931207198
Chosen Option : --

Q.48 A strip footing rests on the surface of a dry cohesionless soil. If the water table rises temporarily to the surface due to flooding, then what percentage reduction factor (RY) is to be applied to bearing capacity factor (NY) according Terzaghi's equation?

- Ans
- 1. 37%
 - 2. 50%
 - 3. 80%
 - 4. 75%

Question ID : 931207200
Chosen Option : 2

Q.49 When liquidity index is greater than 1:

- Ans
- 1. soil is in plastic state
 - 2. soil is in solid state
 - 3. soil is in semi-solid state
 - 4. soil is in liquid state

Question ID : 931207185
Chosen Option : 4

Q.50 A curve which is a combination of two reverse curves is provided in order to avoid intervening obstructions such as the bend of river or a building, etc. is called _____.

- Ans
- 1. compound curve
 - 2. super elevation curve
 - 3. serpentine curve
 - 4. deviation curve

Question ID : 931207167
Chosen Option : 1

Q.51 A rectangular weir $10\sqrt{10}$ m wide has a constant head of 1m. If the coefficient of discharge is 0.6 and $g = 9.8 \text{ m/s}^2$, the discharge over the notch will be:

- Ans
- 1. 56000 litres per sec
 - 2. 28000 litres per sec
 - 3. 63600 litres per sec
 - 4. 71096 litres per sec

Question ID : 931207210
Chosen Option : --

Q.52 Where rosin is used as resin in varnish, a suitable solvent will be:

- Ans
- 1. linseed oil
 - 2. turpentine
 - 3. wood naphtha
 - 4. methylated spirit of wine

Question ID : 931207146
Chosen Option : --

Q.53 The difference in length between the arc and the subtended chord on the earth's surface is taken as 500mm in:

- Ans
- 1. 18.2 km
 - 2. 500 km
 - 3. 100 km
 - 4. 91km

Question ID : 931207157
Chosen Option : 4

Q.54 Which of the following is true for compaction test on soil using light compaction under Indian standard compaction test?

- Ans
- 1. 12 N rammer falls through a height of 150 mm
 - 2. 48.9 N rammer falls through a height of 310 mm
 - 3. 48.9 N rammer falls through a height of 450 mm
 - 4. 26 N rammer falls through a height of 310 mm

Question ID : 931207195
Chosen Option : 3

Q.55 Bulking of sand is more in:

- Ans
- 1. gravelly sand
 - 2. fine sand
 - 3. medium sand
 - 4. coarse sand

Question ID : 931207153
Chosen Option : 2

Q.56 Which of the following is INCORRECT about the efficiency of a basin in a horizontal flow sedimentation tank?

- Ans
1. It is a function of detention period
 2. It is function of surface area of the basin relative to the rate of flow
 3. It is function of settling velocities of particles
 4. It is not a function of depth of basin

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Question ID : 931207227
Chosen Option : 4

Q.57 The minimum velocity of water in a distribution main pipe 10 cm diameter must be:

- Ans
- 1. 1.8 m/s
 - 2. 1.5 m/s
 - 3. 1.2 m/s
 - 4. 0.9 m/s

Question ID : 931207220
Chosen Option : 2

Q.58 If the pressure at any point in the liquid approaches the _____ (1), the liquid starts vaporising. Vapour bubbles that are created in the region of _____ (2) are carried with the liquid to the region of _____ (3). Bubbles explode and collapse there which damage the walls of a conduit and also creates air pockets. The phenomenon is known as _____ (4).

- Ans
- 1.
(1) saturation vapour pressure, (2) low pressure, (3) high pressure, (4) cavitation
 - 2.
(1) atmospheric pressure, (2) low pressure, (3) high pressure, (4) cavitation
 - 3.
(1) cavitation low pressure, (2) high pressure, (3) saturation vapour pressure (4) meniscus effect
 - 4.
(1) saturation vapour pressure, (2) high pressure, (3) low pressure, (4) cavitation

Question ID : 931207203
Chosen Option : 1

Q.59 Imh_{off} cone is used to determine quantity of _____ in sewage.

- Ans
- 1. collide solids
 - 2. suspended settleable solids
 - 3. dissolved solids
 - 4. suspended non-settleable solids

Question ID : 931207224
Chosen Option : 2

Q.60 The compressive strength of any individual brick tested in the sample shall not fall below the minimum compressive strength specified for the corresponding class of brick by more than:

- Ans
- 1. 20%
 - 2. 12.5%
 - 3. 10%
 - 4. 15%

Question ID : 931207144
Chosen Option : 4

Q.61 Which of the following is INCORRECT with reference to Unconfined Compression Test on soil?

- Ans**
- 1. This test cannot be performed on coarse-grained soil.
 - 2. This test cannot be performed on remoulded cohesive soil.
 - 3.
- It is a special case of triaxial compression test in which vertical axial stress is the major principal stress and other two principal stresses are zero.
- 4. Failure plane is not predetermined.

Question ID : 931207191
Chosen Option : --

Q.62 In a prismatic compass:

- Ans**
- 1. 0° is marked at the south end of the magnetic needle
 - 2. 180° is marked at the south end of the magnetic needle
 - 3. 90° is marked at the south end of the magnetic needle
 - 4.
- 0° is marked both at the south end as well as the north end of the magnetic needle

Question ID : 931207161
Chosen Option : 1

Q.63 Fine grained soil is said to be silts and clay of low compressibility, if liquid limit is:

- Ans**
- 1. more than 70%
 - 2. between 35% and 50%
 - 3. between 50% and 70%
 - 4. less than 35%

Question ID : 931207177
Chosen Option : --

Q.64 As per IS 8041:1990, for rapid hardening cement, the setting time of cement when tested by the Vicat apparatus method is:

- Ans**
- 1.
initial setting time shall not be less than 30 minutes and final setting time shall not be less than 600 minutes
 - 2.
initial setting time shall not be more than 10 minutes and final setting time shall not be more than 90 minutes
 - 3.
initial setting time shall not be less than 30 minutes and final setting time shall not be more than 600 minutes
 - 4.
initial setting time shall not be more than 30 minutes and final setting time shall not be more than 600 minutes

Question ID : 931207141
Chosen Option : 1

Q.65 A series of closed contour on the map having higher values outside is a:

- Ans
- 1. Plane ground
 - 2. Hill
 - 3. Depression
 - 4. Saddle

Question ID : 931207169
Chosen Option : 3

Q.66 A principal is defined as:

- Ans
- 1. a plane subjected to only shear stresses
 - 2. a plane subjected to only normal stress but no shear stress
 - 3. a plane subjected to either normal or shear stresses
 - 4. a plane subjected to normal as well as shear stresses

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Question ID : 931207186
Chosen Option : 2

Q.67 Soil-phase diagram for a soil sample can be called a unit-phase diagram if volume of _____ in the soil sample is considered as unity.

- Ans
- 1. air voids
 - 2. air and water voids together
 - 3. solids
 - 4. water voids

Question ID : 931207183
Chosen Option : 3

Q.68 At about what temperature do two important constituents of brick clay, namely, alumina and sand bind themselves together resulting in increase of strength and density of brick?

- Ans
- 1. 1100 °C
 - 2. 105 °C to 120 °C
 - 3. 1400 °C
 - 4. 650 °C

Question ID : 931207154
Chosen Option : 3

Q.69 Stones are classified as under:

Igneous	Sedimentary	Metamorphic
Basalt	Slate	Gneiss
Granite	Marble	Lime stone

Which of the classifications are INCORRECT?

- Ans
1. Basalt and lime stone
 2. Slate and gneiss
 3. Granite and marble
 4. Slate and lime stone

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Question ID : 931207142
Chosen Option : 4

Q.70 Which of the following is a base for paint?

- Ans
1. Spirit of turpentine
 2. Oxide of iron
 3. Linseed oil
 4. Litharge

Question ID : 931207145
Chosen Option : 3

Q.71 A saturated soil sample can be represented by:

- Ans
1. two phase system
 2. three phase system
 3. one phase system
 4. no phase system

Question ID : 931207171
Chosen Option : 1

Q.72 A vane 12 cm long and 6 cm in diameter was pressed into soft clay. Both the top and the bottom of the vane partake in shearing the soil. What will be the shear strength of clay on a horizontal plane if torque applied at failure is 47520 N/mm?

- Ans**
1. 0.04 N/mm²
 2. 0.042 N/mm²
 3. 0.06 N/mm²
 4. 0.022 N/mm²

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Question ID : 931207193

Chosen Option : 2

Q.73 In a penetration test to determine bearing capacity of soil, Penetration Number indicates the number of blows required to cause _____ penetration of a split-spoon sampler into the soil under test by means of a _____ hammer falling through _____.

- Ans**
1. 300 mm, 75 kg, 500 mm
 2. 750 mm, 75 kg, 750 mm
 3. 300 mm, 65 kg, 750 mm
 4. 500mm, 65 kg, 300 mm

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Question ID : 931207199

Chosen Option : 1

Q.74 In Triaxial Compression Test on a soil sample to determine its shear strength, compressive stresses are applied in three mutually perpendicular directions and:

- Ans**
1. two of the three stresses are increased till the specimen fails while the third remains constant
 2. all three stresses are maintained constant till the specimen fails
 3. all three stresses are increased till the specimen fails
 4. one of the three stresses are increased till the specimen fails while other two remain constant

Question ID : 931207190

Chosen Option : 3

Q.75 A dry soil sample has void ratio 0.4. Without any change in void ratio, water is added to the sample so that its degree of saturation is 35%. Considering the unit weight of water as 10 kN/m^3 , the increase in unit weight of the sample will be:

- Ans**
1. 1.4 kN/m^3
 2. 1 kN/m^3
 3. 1.35 kN/m^3
 4. 10 kN/m^3

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Question ID : 931207173
Chosen Option : --

Q.76 As reported by the Press Information Bureau, Government of India, Ministry of Consumer Affairs, Food & Public Distribution, dated 16th November 2019, Bureau of Indian Standards has collected tap water samples and tests were conducted as per IS 10500:2012. All 10 samples from which of the following cities complied with all the requirements?

- Ans**
1. Chennai
 2. Mumbai
 3. Chandigarh
 4. Delhi

Question ID : 931207222
Chosen Option : 1

Q.77 Which of the following statements is/are INCORRECT about the most efficient triangular section open channel?

- Top width of flow of water is twice of the depth of water.
- Sides of a channel make 45° with the vertical.
- Hydraulic depth is 75% of the depth of water.

- Ans**
1. i and ii both are incorrect
 2. iii is incorrect
 3. i is incorrect
 4. ii is incorrect

Question ID : 931207212
Chosen Option : 3

Q.78 At least _____ of dissolved oxygen must be present in treated wastewater while discharging it into another water body.

- Ans**
1. 7 ppm
 2. 2 ppm
 3. 8.4 ppm
 4. 4 ppm

Question ID : 931207225
Chosen Option : 4

Q.79 Porosity of a soil sample is the ratio of:

- Ans
- 1. volume of voids to volume of solids
 - 2. total volume of sample to volume of voids
 - 3. volume of voids to total volume of sample
 - 4. volume of solids to volume of voids

Question ID : 931207172
Chosen Option : 3

Q.80 A freshly cut surface of timber should exhibit:

- Ans
- 1. hardness and light/dull colour
 - 2. hardness and should shine
 - 3. softness and light/dull colour
 - 4. softness and should shine

Question ID : 931207148
Chosen Option : 3

Q.81 Which of the following cases will result in reduction in the bearing capacity of soil?

- i. Depth of water table below the base of the footing is equal to or greater than width of the footing
- ii. Depth of water table below the base of the footing is less than width of the footing.
- iii. Water table is at the level of base of the footing.
- iv. Water table is above the base of the footing.

- Ans
- 1. Only i
 - 2. Only iv
 - 3. ii, iii and iv
 - 4. Both iii and iv

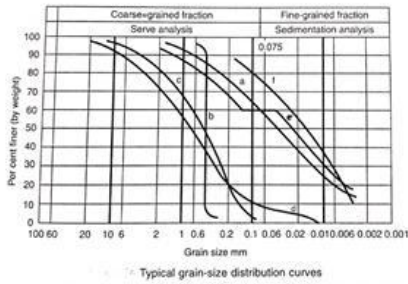
Question ID : 931207196
Chosen Option : 3

Q.82 Sand replacement method or core cutter method is used to determine:

- Ans
- 1. in-situ unit weight of soil
 - 2. permeability of soil
 - 3. consistency limits of soil
 - 4. consolidation of soil

Question ID : 931207184
Chosen Option : 4

Q.83 In the following typical grain-size distribution curves for soil, curve 'b' indicates:



- Ans
- 1. gap graded soil
 - 2. predominantly fine grained soil
 - 3. poorly graded soil
 - 4. uniform soil

Question ID : 931207175
Chosen Option : 4

Q.84 Which of the following is NOT true about the Direct Shear Test?

- Ans
- 1. Two types of applications of shear are possible, one is shear stress controlled type and other is shear strain controlled type.
 - 2. Gradually increasing shear force is applied to the upper half of the shear box.
 - 3. After placing a soil sample in a shear box, a constant vertical force is applied at the top which produces normal stress.
 - 4. Shearing plane is vertical from centre of the specimen.

Question ID : 931207189
Chosen Option : 1

Q.85 Bernoulli's equation is NOT applicable for:

- Ans
- 1. Incompressible flow
 - 2. Rotational flow
 - 3. One dimensional flow
 - 4. Flow of ideal fluid with zero viscosity

Question ID : 931207207
Chosen Option : 2

Q.86 What is the required duration for seasoning of stone?

- Ans
- 1. 8 to 12 hours
 - 2. 6 to 12 months
 - 3. 1 to 2 months
 - 4. 7 to 10 days

Question ID : 931207152
Chosen Option : 3

Q.87 A particle passes through a 4.75 mm IS sieve and retained on a 0.075 mm IS sieve is called as:

- Ans
- 1. clay
 - 2. silt
 - 3. sand
 - 4. gravel

Question ID : 931207174
Chosen Option : 3

Q.88 Which of the following is exclusively a field test to determine shear strength of soil?

- Ans
- 1. Direct shear test
 - 2. Triaxial compression test
 - 3. Unconfined compression test
 - 4. Penetration test

Question ID : 931207188
Chosen Option : 3

Q.89 A layer of soft clay is 6m thick and lies under a newly constructed building. The weight of sand overlying the clayey layer produces a pressure of 250 kN/m^2 and the new construction increases the pressure by 20%. If the effective compression index is 0.5 and the void ratio is 1, the consolidation settlement will be _____. Take $\log_{10} 1.2 = 0.08$

- Ans
- 1. 22.6 cm
 - 2. 20 cm
 - 3. 8.8 cm
 - 4. 12 cm

Question ID : 931207181
Chosen Option : 4

Q.90 The type of cement which contains admixtures which decreases wetting ability of cement grains is:

- Ans
- 1. hydrophobic cement
 - 2. rapid hardening cement
 - 3. quick setting cement
 - 4. expanding cement

Question ID : 931207150
Chosen Option : 4

Section : Quantitative Aptitude & Logical Ability

Q.1 A dealer marks his goods 25% above the cost price and gives a discount of 8%. Find the profit percentage.

- Ans
- 1. 15%
 - 2. 10%
 - 3. 17%
 - 4. 25%

Question ID : 931207232
Chosen Option : 1

Q.2 Find value of $\tan^2 30 + \sin^2 45$.

- Ans
- 1. $\frac{\sqrt{3}}{\sqrt{2}}$
 - 2. $\frac{3}{2}$
 - 3. $\frac{2}{3}$
 - 4. $\frac{\sqrt{2}}{\sqrt{3}}$

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Question ID : 931207239
Chosen Option : 4

Q.3 If $a - b = 2$ and $ab = 24$, then find $a^2 + b^2$.

- Ans
- 1. 52
 - 2. 48
 - 3. 46
 - 4. 54

Question ID : 931207237
Chosen Option : 1

Q.4 The distance between two towns is 90 km which is covered in 1 hour and 40 minutes. If the speed is decreased by 6 km/h, then what would be the increase in time?

- Ans**
- 1. 8 minutes
 - 2. $12\frac{1}{2}$ minutes
 - 3. $10\frac{1}{2}$ minutes
 - 4. 14 minutes

Question ID : 931207235
Chosen Option : 2

Q.5 A child ran 500 m towards the north from a park. He then took a left turn and ran 500 m. Then he took a right turn and ran 500 m. Finally, he took a left turn and ran 100 m. Which direction is the child facing now?

- Ans**
- 1. East
 - 2. South
 - 3. North
 - 4. West

Question ID : 931207248
Chosen Option : 4

Q.6 Without using tables find the value of $\frac{5 \sin 62^\circ}{\cos 28^\circ} - \frac{2 \sec 34^\circ}{\operatorname{cosec} 56^\circ}$

- Ans**
- 1. 7
 - 2. 3
 - 3. 2
 - 4. 8

Question ID : 931207240
Chosen Option : 2

Q.7 Select the number that can replace the question mark (?) in the following series.

4, 9, 14, 19, ?

- Ans**
- 1. 29
 - 2. 24
 - 3. 21
 - 4. 31

Question ID : 931207244
Chosen Option : 2

Q.8 Five friends, A, B, C, D and E, study in the same school. D is not taller than B. A is taller than E but not as tall as D. B is taller than E. Who among the following is the tallest?

- Ans**
1. B
 2. D
 3. C
 4. E

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Question ID : 931207243
Chosen Option : 1

Q.9 Select the mirror image of the following figure from the given option figures.

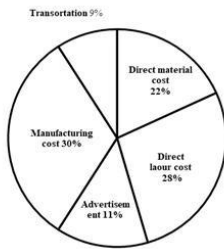


Ans

1.
2.
3.
4.

Question ID : 931207242
Chosen Option : 4

Q.10 The following pie chart shows the percentage distribution of expenditure incurred in manufacturing a certain product 'X'. Study the pie chart and answer the given question.



The price of product 'X' is marked 25% above the C.P. If the marked price of the product is ₹200, then what is the approximate manufacturing cost?

- Ans**
- 1. ₹35
 - 2. ₹48
 - 3. ₹50
 - 4. ₹45

Question ID : 931207245

Chosen Option : 2

Q.11 If '+' means 'divided by', '-' means 'add', '×' means 'minus' and '÷' means 'multiplied by', then what will be the value of the following expression?

$$[{\{(15 \times 3) \div 2\} + (3 - 3)]/2$$

- Ans**
- 1. 8
 - 2. 4
 - 3. 6
 - 4. 2

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Question ID : 931207241

Chosen Option : 4

Q.12 A wire is bent to form the shape of a rectangle whose length is 45 cm and breadth 29 cm. If the same wire is bent to form a square, then what would be the area of the square so formed?

- Ans**
- 1. 1369 cm²
 - 2. 1325 cm²
 - 3. 1296 cm²
 - 4. 1310 cm²

Question ID : 931207236

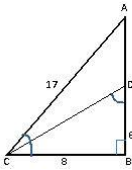
Chosen Option : 1

Q.13 Four letter-clusters have been given, out of which three are alike in some manner and one is different. Select the odd one.

- Ans** 1. ABCI
 2. QRSU
 3. LMNP
 4. BCDF

Question ID : 931207250
Chosen Option : 1

Q.14 Observe the following triangle and find $\sin\theta$ and $\sin\Phi$ (Angle $ACB = \theta$ and angle $COB = \Phi$) when $BD = 6$, $BC = 8$, $AC = 17$.



- Ans** 1. $15/17$ and $3/4$
2. $15/17$ and $4/5$
3. $8/17$ and $8/9$
4. $6/17$ and $4/5$

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Question ID : 931207238
Chosen Option : 2

Q.15 A sum of money invested @ 5% for 3 years yields ₹2,175 and the same if invested @ 8% for 5 years yields ₹5,800. Find the sum.

- Ans** 1. ₹14,500
2. ₹12,000
3. ₹13,400
4. ₹15,200

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Question ID : 931207233
Chosen Option : 1

Q.16 In a certain code language, 'HOCKEY' is written as 'IQFOJE'. How will 'CRICKET' be written as in that language?

- Ans** 1. DTNIRMC
 2. DTKFOJZ
 3. DTLGPKA
 4. DTMHQLB

Question ID : 931207247
Chosen Option : 3

Q.17 Select the option that is related to the third term in the same way as the second term is related to the first term.

Bore : Augur :: Scoop : ?

- Ans
- 1. Axe
 - 2. Shovel
 - 3. Tongs
 - 4. Oar

Question ID : 931207246
Chosen Option : 2


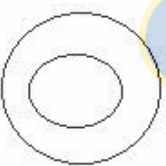

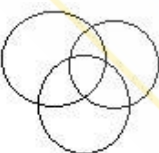
Q.18 By what number should 4^{-8} be multiplied to get 16?

- Ans
- 1. 4^{-2}
 - 2. 4^5
 - 3. 4^{10}
 - 4. 4^{-9}

Question ID : 931207231
Chosen Option : 3

Q.19 Select the Venn diagram that best represents the relationship between the following classes.

Dollar, Honey, Currency

- Ans
- 1. 
 - 2. 
 - 3. 
 - 4. 

Question ID : 931207249
Chosen Option : 2

Q.20 20 men can do a painting in 30 days. How many men should be engaged to do the same painting in 24 days?

- Ans
- 1. 22
 - 2. 24
 - 3. 25
 - 4. 27

Question ID : 931207234
Chosen Option : 3

Section : General English

Q.1 Select the most appropriate meaning of the idiom underlined in the given sentence.

The Lilies bloom once in a blue moon.

- Ans
- 1. a rare occurrence
 - 2. frequent incident
 - 3. a shade of the moon
 - 4. a sign of bad luck

Question ID : 931207258
Chosen Option : 1

Q.2 Select the option that expresses the given sentence in passive voice.

Meena was peeling the potatoes.

- Ans
- 1. The potatoes were being peeled by Meena.
 - 2. The potatoes are being peeled by Meena.
 - 3. The potatoes were peeled by Meena.
 - 4. The potatoes are peeled by Meena.

Question ID : 931207252
Chosen Option : 1

Q.3 Parts of the following sentence are given as options. Identify the part that has an error.

He moves far away from the cottage after the accident.

- Ans
- 1. far away from
 - 2. He moves
 - 3. the accident
 - 4. the cottage after

Question ID : 931207257
Chosen Option : 2

Q.4 Select the most appropriate synonym of the given word.

HUMBLE

- Ans
- 1. arrogant
 - 2. modest
 - 3. proud
 - 4. haughty

Question ID : 931207255
Chosen Option : 2

Q.5 Select the option that expresses the given sentence in indirect speech.

Remy asked Tej, "Did you speak to Stella?"

- Ans
- 1. Remy asked Tej if he was speaking to Stella.
 - 2. Remy asked Tej if he spoke to Stella.
 - 3. Remy asked Tej whether he had spoken to Stella.
 - 4. Remy asked Tej whether he has spoken to Stella.

Question ID : 931207253
Chosen Option : 3

Q.6 Select the most appropriate ANTONYM of the given word.

FIGHT

- Ans
- 1. battle
 - 2. truce
 - 3. quarrel
 - 4. clash

Question ID : 931207256
Chosen Option : 2

Q.7 Select the most appropriate option to fill in the blank.

The kids were playing in the garden when the car _____ into the tree.

- Ans
- 1. crash
 - 2. is crashing
 - 3. crashes
 - 4. crashed

Question ID : 931207254
Chosen Option : 4

Q.8 Parts of a sentence are given below in jumbled order. Arrange the parts in the right order to form a meaningful sentence.

to consider / of every action/ always remember / the consequences / you take

- Ans
- 1.
The consequences you take always remember of every action to consider.
 - 2.
Of every action the consequences you take always remember to consider.
 - 3.
To consider the consequences always remember you take of every action.
 - 4.
Always remember to consider the consequences of every action you take.

Question ID : 931207259
Chosen Option : 4

Q.9 Parts of the following sentence are given as options. Identify the part that has an error.

Dev has not yet understand the flaws in his master plan.

- Ans
- 1. yet understand
 - 2. the flaws in
 - 3. Dev has not
 - 4. his master plan

Question ID : 931207251
Chosen Option : 1

Q.10 Select the option that can be used as a one-word substitute for the given phrase.

The study of celestial bodies

- Ans
- 1. entomology
 - 2. sociology
 - 3. astronomy
 - 4. geology

Question ID : 931207260
Chosen Option : 3

Section : General Awareness

Q.1 The book 'Mind Master: Winning Lessons from a Champion's Life' is co-authored by:

- Ans
- 1. VVS Laxman
 - 2. Satya Nadella
 - 3. Barack Obama
 - 4. Viswanathan Anand

Question ID : 931207268
Chosen Option : 4

Q.2 Which of the following won the Safaigiri Award, 2019, for creating awareness and infrastructure in health and sanitation?

- Ans
- 1. Global Interfaith WASH Alliance
 - 2. Water Literacy Foundation (WLF) and Ayyappa Masagi
 - 3. Hindustan Unilever
 - 4. Siruthuli (an NGO)

Question ID : 931207278
Chosen Option : --

Q.3 Which of the following is defined as the number of females per 1000 males in the population?

- Ans
- 1. Death rate
 - 2. Sex ratio
 - 3. Sex index
 - 4. Birth rate

Question ID : 931207265
Chosen Option : 2

Q.4 Ishwar Chandra Vidyasagar emphasised on:

- Ans
- 1. women employment
 - 2. family planning
 - 3. widow remarriage
 - 4. abolition of dowry system

Question ID : 931207277
Chosen Option : 3

Q.5 IMPS, NEFT and RTGS are three platforms that enable instant money transfers. What is the full form of NEFT?

- Ans
- 1. Nominal Electronic Funds Transfer
 - 2. National Electronic Foreign Transaction
 - 3. National Electronic Funds Transfer
 - 4. National Emergency Funds Transfer

Question ID : 931207262
Chosen Option : 3

Q.6 Which of the following is NOT a step in drinking water treatment?

- Ans
- 1. Coagulation and flocculation
 - 2. Sedimentation
 - 3. Decantation
 - 4. Disinfection

Question ID : 931207273
Chosen Option : 3

Q.7 'Chemically, these soils are rich in lime, iron, magnesia and alumina. They also contain potash. But they lack in phosphorous, nitrogen and organic matter.' Name the soil type.

- Ans
- 1. Arid soil
 - 2. Laterite soil
 - 3. Black soil
 - 4. Alluvial soil

Question ID : 931207275
Chosen Option : --

Q.8 Shown here is the image of the Meenakshi temple. Where is it located?



- Ans
- 1. Tejjpur, Assam
 - 2. Puri, Odisha
 - 3. Madurai, Tamil Nadu
 - 4. Tirupati, Andhra Pradesh

Question ID : 931207261
Chosen Option : 3

Q.9 Which of the following players received the Lifetime Achievement Award in Sports in September 2019?

- Ans
- 1. Pulella Gopichand
 - 2. Sunil Chhetri
 - 3. Manuel Fredricks
 - 4. Smriti Mandhana

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Question ID : 931207270
Chosen Option : 2

Q.10 Bonalu is a Hindu festival of Telangana where Goddess _____ is worshipped.

- Ans
- 1. Mahakali
 - 2. Saraswati
 - 3. Durga
 - 4. Lakshmi

Question ID : 931207271
Chosen Option : 1

Q.11 Name the country that shares its borders with the Indian states of Nagaland, Mizoram, Arunachal Pradesh and Manipur and whose present capital is Naypyidaw.

- Ans
- 1. Myanmar
 - 2. Bhutan
 - 3. China
 - 4. Indonesia

Question ID : 931207266
Chosen Option : 1

Q.12 The motion of a swing is an example of _____ motion.

- Ans
- 1. rectilinear
 - 2. curvilinear
 - 3. oscillatory
 - 4. rotatory

Question ID : 931207263
Chosen Option : 3

Q.13 What is the full form of UNEP?

- Ans
- 1. United Nations Educational Programme
 - 2. United Nations Economic Programme
 - 3. United Nations Environment Project
 - 4. United Nations Environment Programme

Question ID : 931207274
Chosen Option : 1

Q.14 What is the type of farming that relies on crop rotation, green manure, compost, biological pest control and mechanical cultivation?

- Ans
- 1. Organic farming
 - 2. Vertical farming
 - 3. Multicrop farming
 - 4. Polyhouse farming

Question ID : 931207276
Chosen Option : 3

Q.15 UCI World Championships is a _____ event.

- Ans
- 1. cricket
 - 2. boating
 - 3. cycling
 - 4. boxing

Question ID : 931207280
Chosen Option : 3

Q.16 Curd (yogurt) is rich in:

- Ans
- 1. iron and sulphur
 - 2. calcium and phosphorus
 - 3. sodium and chlorine
 - 4. potassium and magnesium

Question ID : 931207264
Chosen Option : 2

Q.17 In which Schedule of the Constitution of India would one find the Union List, State List and Concurrent List?

- Ans
- 1. Tenth Schedule
 - 2. Second Schedule
 - 3. Fifth Schedule
 - 4. Seventh Schedule

Question ID : 931207269
Chosen Option : 3

Q.18 The Congress-League Scheme, 1916, is also known as the:

- Ans
- 1. Kanpur pact
 - 2. Lucknow pact
 - 3. Delhi pact
 - 4. Allahabad pact

Question ID : 931207267
Chosen Option : 4

Q.19 Which Article of the Constitution of India makes provision for free and compulsory education for children?

- Ans
- 1. 98
 - 2. 68
 - 3. 290
 - 4. 45

Question ID : 931207279
Chosen Option : 4

Q.20 Which of the following is NOT true about ROM?

- Ans
- 1. It is cheaper than RAM
 - 2. It is static and does not require refreshing
 - 3. It is easy to test
 - 4. It is volatile in nature

Question ID : 931207272
Chosen Option : 4

