# Uttar Pradesh Metro Rail Corporation Limited
## उत्तर प्रदेश मेट्रो रेल कॉर्पोरेशन लिमिटेड

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

**UP Metro Rail Corporation**

| 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** 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** ✗ A.

(1) atmospheric pressure, (2) low pressure, (3) high pressure, (4) cavitation

✗ B.

(1) cavitation low pressure, (2) high pressure, (3) saturation vapour pressure (4) meniscus effect

✔ C.

(1) saturation vapour pressure, (2) low pressure, (3) high pressure, (4) cavitation

✗ D.

(1) saturation vapour pressure, (2) high pressure, (3) low pressure, (4) cavitation

Question ID : 931207203
Chosen Option : 3

**Q.2** Porosity of a soil sample is the ratio of:

**Ans** ✗ A. volume of solids to volume of voids

✔ B. volume of voids to total volume of sample

✗ C. volume of voids to volume of solids

✗ D. total volume of sample to volume of voids

Question ID : 931207172
Chosen Option : 2

**Q.3** Which of the following statements is/are INCORRECT about the most efficient triangular section open channel?

    i.       Top width of flow of water is twice of the depth of water.

    ii.      Sides of a channel make 45° with the vertical.

    iii.     Hydraulic depth is 75% of the depth of water.

**Ans** ✘ A. i and ii both are incorrect

    ✘ B. ii is incorrect

    ✔ C. iii is incorrect

    ✘ D. i is incorrect

> Question ID : 931207212
> Chosen Option : 3

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**Q.4** In Triaxial Compression Test on a soil sample to determine its shear strength, compressive stresses are applied in three mutually perpendicular directions and:

**Ans** ✘ A. all three stresses are increased till the specimen fails

    ✔ B.
one of the three stresses are increased till the specimen fails while other two remain constant

    ✘ C.
two of the three stresses are increased till the specimen fails while the third remains constant

    ✘ D.
all three stresses are maintained constant till the specimen fails

> Question ID : 931207190
> Chosen Option : 4

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**Q.5** $\frac{ALN}{60}$ 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** ✘ A. Diffuser pump

    ✔ B. A single acting reciprocating pump

    ✘ C. Triple cylinder pump

    ✘ D. A double acting reciprocating pump

> Question ID : 931207213
> Chosen Option : 2

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**Q.6** The permissible limits for pH of drinking water must be:

**Ans** ✔ A. 6.5 to 8.5

    ✘ B. 1 to 14

    ✘ C. 7 to 8

    ✘ D. 1 to 7

> Question ID : 931207216
> Chosen Option : 1

**Q.7** A series of closed contour on the map having higher values outside is a:

**Ans**
- ✗ A. Plane ground
- ✗ B. Saddle
- ✓ C. Depression
- ✗ D. Hill

Question ID : **931207169**
Chosen Option : **3**

**Q.8** The horizontal distance between two consecutive contours is termed as _____.

**Ans**
- ✗ A. contour equivalent
- ✗ B. contour interval
- ✓ C. horizontal equivalent
- ✗ D. horizontal interval

Question ID : **931207168**
Chosen Option : **3**

**Q.9** 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**
- ✓ A. dead end system
- ✗ B. reticulation system
- ✗ C. ring system
- ✗ D. radial system

Question ID : **931207221**
Chosen Option : **4**

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

**Ans**
- ✗ A. 1.8 m/s
- ✓ B. 0.9 m/s
- ✗ C. 1.5 m/s
- ✗ D. 1.2 m/s

Question ID : **931207220**
Chosen Option : **4**

**Q.11** 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 km$^2$.

    iv.     Degree of accuracy is low.

**Ans**

  ✗ A.  i and iii are not true

  ✗ B.  i and iv are not true

  ✔ C.  ii and iii are not true

  ✗ D.  ii and iv are not true

Question ID : 931207156
Chosen Option : 3

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**Q.12** In Bernoulli's equation, Total head =?

**Ans**

  ✔ A.  Pressure head + Kinetic head + Potential head

  ✗ B.  Pressure head + Kinetic head – Potential head

  ✗ C.  Pressure head – Kinetic head + Potential head

  ✗ D.  Pressure head – Kinetic head – Potential head

Question ID : 931207208
Chosen Option : 1

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**Q.13** Which of the following is exclusively a field test to determine shear strength of soil?

**Ans**

  ✗ A.  Triaxial compression test

  ✗ B.  Direct shear test

  ✗ C.  Unconfined compression test

  ✔ D.  Penetration test

Question ID : 931207188
Chosen Option : 4

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**Q.14** 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**

  ✗ A.  750 mm, 75 kg, 750 mm

  ✔ B.  300 mm, 65 kg, 750 mm

  ✗ C.  500mm, 65 kg, 300 mm

  ✗ D.  300 mm, 75 kg, 500 mm

Question ID : 931207199
Chosen Option : 2

**Q.15** The unit of viscosity is:

Ans ✔ A. poise

✘ B. m/s

✘ C. cumecs

✘ D. N/m

Question ID : **931207201**
Chosen Option : **1**

**Q.16** लकड़ी की ताजी काटी गई सतह किस तरह की होनी चाहिए?

Ans ✔ A. कठोर और चमकदार होनी चाहिए

✘ B. नरम और हल्के/मंद रंग की

✘ C. नरम और चमकदार होनी चाहिए

✘ D. कठोर और हल्के/मंद रंग की

Question ID : **931207148**
Chosen Option : **1**

**Q.17** Which of the following statements is INCORRECT about asbestos?

Ans ✘ A. It is an excellent insulator for electricity

✔ B. It is porous

✘ C. It is an excellent insulator for heat

✘ D. It is fire proof

Question ID : **931207147**
Chosen Option : **2**

**Q.18** 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 m/s², the discharge over the notch will be:

Ans ✔ A. 56000 litres per sec

✘ B. 71096 litres per sec

✘ C. 28000 litres per sec

✘ D. 63600 litres per sec

Question ID : **931207210**
Chosen Option : **1**

Q.19 Which of the following is INCORRECT about the efficiency of a basin in a horizontal flow sedimentation tank?

Ans ✔ A. It is a function of detention period

✘ B. It is function of settling velocities of particles

✘ C. It is not a function of depth of basin

✘ D.

It is function of surface area of the basin relative to the rate of flow

Question ID : 931207227
Chosen Option : 3

Q.20 Self-cleansing velocity should be maintained at least once in _____.

Ans ✘ A. 8 hours

✘ B. a month

✔ C. a day

✘ D. a week

Question ID : 931207223
Chosen Option : 3

Q.21 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 ✘ A. $176°$

✘ B. $154°$

✔ C. $98°$

✘ D. $28°$

Question ID : 931207163
Chosen Option : 3

Q.22 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 swear will be most suitable?

Ans ✘ A. Circular

✘ B. Rectangular

✔ C. Egg shaped

✘ D. Semi circular

Question ID : 931207228
Chosen Option : 3

Q.23 Which of the following is NOT correct with reference to Terzaghi's theory of one-dimensional consolidation?

Ans ✗ A. Soil is completely saturated

✗ B. Flow of water in the soil voids is one-dimensional

✔ C. Soil is non-homogeneous

✗ D. The compression is one-dimensional

Question ID : 931207179
Chosen Option : 3

Q.24 What is the required duration for seasoning of stone?

Ans ✗ A. 7 to 10 days

✗ B. 8 to 12 hours

✔ C. 6 to 12 months

✗ D. 1 to 2 months

Question ID : 931207152
Chosen Option : 3

Q.25 In a residential district, for water to be supplied up to 5 storey height, the pressure in the distribution main must be:

Ans ✗ A. up to $1.2 \, kg/cm^2$

✗ B. $5.5$ to $7 \, kg/cm^2$

✗ C. $1.2$ to $2 \, kg/cm^2$

✔ D. $2$ to $4 \, kg/cm^2$

Question ID : 931207219
Chosen Option : --

Q.26 As reported by the Press Information Bureau, Government of India, Ministry of Consumer Affairs, Food & Public Distribution, dated 16<sup>th</sup> 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 ✔ A. Mumbai

✗ B. Chennai

✗ C. Delhi

✗ D. Chandigarh

Question ID : 931207222
Chosen Option : 2

**Q.27** The difference in length between the arc and the subtended chord on the earth's surface is taken as 500mm in:

Ans ✗ A. 18.2 km
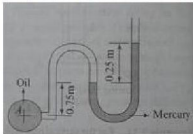
✗ B. 100 km

✔ C. 91km

✗ D. 500 km

**Q.28** A centrifugal pump having a wheel of $\pi^{-1}$ 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 m/s$^2$.

Ans ✗ A. 22. 30 m

✗ B. 12. 38 m

✔ C. 38.75 m

✗ D. 25.00 m

**Q.29** 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 ✗ A. 3.2 m

✗ B. 5 m

✗ C. 1m

✔ D. 4m

**Q.30** 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 ✔ A. $\sqrt[3]{10} : \sqrt[3]{9}$

✗ B. $\sqrt[3]{100} : \sqrt[3]{81}$

✗ C. $\sqrt[3]{9} : \sqrt[3]{10}$

✗ D. $1 : 3$

**Q.31** Which of the following is NOT true about the Direct Shear Test?

Ans ✗ A.

Gradually increasing shear force is applied to the upper half of the shear box.

✔ B. Shearing plane is vertical from centre of the specimen.

✗ C.

Two types of applications of shear are possible, one is shear stress controlled type and other is shear strain controlled type.

✗ D.

After placing a soil sample in a shear box, a constant vertical force is applied at the top which produces normal stress.

Question ID : **931207189**
Chosen Option : **2**

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**Q.32** 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 ✗ A. 40%

✗ B. 12.5%

✔ C. 70%

✗ D. 30%

Question ID : **931207182**
Chosen Option : **3**

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**Q.33** Which of the following is INCORRECT about Piezometer?

Ans ✗ A.

It can be used to measure the positive gauge pressures of a liquid

✗ B. It can be used to measure pressure of a moving liquid

✗ C. It is a simple form of manometer

✔ D. It can be used to measure gas pressure

Question ID : **931207206**
Chosen Option : **4**

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**Q.34** 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 ✗ A. 5.0 mm/s

✔ B. 0.5 mm/s

✗ C. 0.1 mm/s

✗ D. 0.2 mm/s

Question ID : **931207178**
Chosen Option : **2**

**Q.35** 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/m² 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 $\log_{10} 1.2 = 0.08$
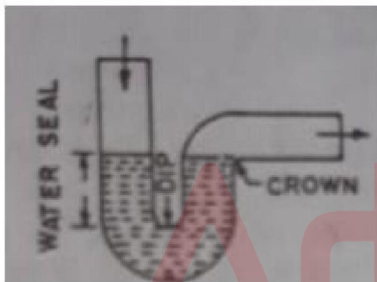
Ans ✗ A. 8.8 cm

✔ B. 12 cm

✗ C. 22.6 cm

✗ D. 20 cm

Question ID : 931207181
Chosen Option : --

**Q.36** Which of the following is a base for paint?

Ans ✗ A. Litharge

✗ B. Spirit of turpentine

✗ C. Linseed oil

✔ D. Oxide of iron

Question ID : 931207145
Chosen Option : 4

**Q.37** The given figure in an example of a _____.



Ans ✗ A. S–trap

✗ B. Q–trap

✔ C. P–trap

✗ D. half–S–trap

Question ID : 931207230
Chosen Option : 1

**Q.38** The process of compaction of soil involves:

**Ans**
- ✔ A. expulsion of air only from the soil
- ✘ B.
  reducing the dry density of soil by tamping, rolling or vibration of soil
- ✘ C. expulsion of air and water from the soil
- ✘ D. expulsion of water only from the soil

Question ID : 931207194
Chosen Option : 2

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**Q.39** Fine grained soil is said to be silts and clay of low compressibility, if liquid limit is:

**Ans**
- ✘ A. more than 70%
- ✘ B. between 35% and 50%
- ✔ C. less than 35%
- ✘ D. between 50% and 70%

Question ID : 931207177
Chosen Option : 3

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**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**
- ✘ A. 1.128 m
- ✘ B. 2.613 m
- ✔ C. 1.185 m
- ✘ D. 0.216 m

Question ID : 931207166
Chosen Option : 4

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**Q.41** 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**
- ✘ A. 1 $kN/m^3$ s
- ✘ B. 1.4 $kN/m^3$
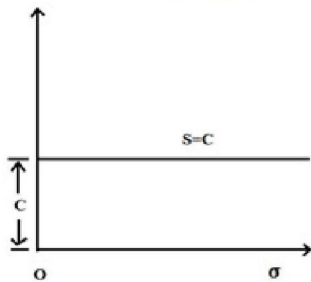- ✔ C. 1.35 $kN/m^3$
- ✘ D. 10 $kN/m^3$

Question ID : 931207173
Chosen Option : 3

**Q.42** The time needed to complete BOD and COD tests on wastewater is _____ respectively.

Ans ✗ A. 5 hours and 3 hours

✓ B. 5 days and 3 hours

✗ C. 5 days and 3 days

✗ D. 3 days and 5 hours

Question ID : **931207226**
Chosen Option : **3**

**Q.43** If Coulomb's envelop takes the shape as shown in the figure, it must be:



Ans ✓ A. pure clay

✗ B. sandy soil

✗ C. c-φ soil

✗ D. either sandy soil or pure clay

Question ID : **931207187**
Chosen Option : **1**

**Q.44** 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 ✗ A. 75%

✗ B. 80%

✓ C. 50%

✗ D. 37%

Question ID : **931207200**
Chosen Option : **3**

**Q.45** The type of cement which contains admixtures which decreases wetting ability of cement grains is:

Ans  ✗ A. expanding cement

✔ B. hydrophobic cement

✗ C. quick setting cement

✗ D. rapid hardening cement

Question ID : 931207150
Chosen Option : 2

**Q.46** The vertical distance between the centreline of the centrifugal pump and the liquid surface in the pump is called as:

Ans  ✗ A. delivery head

✔ B. Suction head

✗ C. dynamic head

✗ D. manometric head

Question ID : 931207214
Chosen Option : 2

**Q.47** A particle passes through a 4.75 mm IS sieve and retained on a 0.075 mm IS sieve is called as:

Ans  ✔ A. sand

✗ B. clay

✗ C. gravel

✗ D. silt

Question ID : 931207174
Chosen Option : 1

**Q.48** A principal is defined as:

Ans  ✗ A. a plane subjected to only shear stresses

✔ B. a plane subjected to only normal stress but no shear stress

✗ C. a plane subjected to normal as well as shear stresses

✗ D. a plane subjected to either normal or shear stresses

Question ID : 931207186
Chosen Option : 2

**Q.49** निम्नलिखित में से कौन सा एक सीवेज अनुलग्नक नहीं है?

Ans

✔ A. ट्रिकलिंग फिल्टर

✗ B. कैच बेसिन

✗ C. मैनहोल

✗ D. इनवर्टेड साइफन

Question ID : 931207229
Chosen Option : 1

**Q.50** _____ एक प्रकार का मार्ग है, जो जल को ऐसे किसी बांध के ऊपर से नीचे की ओर प्रवाहित करने की अनुमति देता है, जिसमें प्रवाह को नियंत्रित करने के लिए फ्लड गेट (flood gate) होते हैं।

Ans

✔ A. अधिप्लव मार्ग (Spillway)

✗ B. फ्लूम (Flume)

✗ C. गैलरी (Gallery)

✗ D. स्लूइसवे (Sluiceway)

Question ID : 931207209
Chosen Option : 4

**Q.51** When liquidity index is greater than 1:

Ans

✗ A. soil is in plastic state

✗ B. soil is in semi-solid state

✔ C. soil is in liquid state

✗ D. soil is in solid state

Question ID : 931207185
Chosen Option : 3

**Q.52** Sand replacement method or core cutter method is used to determine:

Ans

✗ A. permeability of soil

✗ B. consolidation of soil

✔ C. in-situ unit weight of soil

✗ D. consistency limits of soil

Question ID : 931207184
Chosen Option : 2

**Q.53** 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**

  ✗ A.  ii and iii both are true

  ✗ B.  i is true

  ✗ C.  ii is true

  ✔ D.  i and ii both are true

Question ID : 931207180
Chosen Option : 1

**Q.54** 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**

  ✔ A.  solids

  ✗ B.  air voids

  ✗ C.  air and water voids together

  ✗ D.  water voids

Question ID : 931207183
Chosen Option : 3

**Q.55** Chlorine usage in the treatment of $25000 \text{ m}^3/\text{day}$ is 9 kg. The dosage in milligram per litre is:

**Ans**

  ✗ A.  360

  ✗ B.  2.778

  ✗ C.  0.0028

  ✔ D.  0.36

Question ID : 931207218
Chosen Option : 2

**Q.56** 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**

  ✗ A.  $0.042 \text{ N/mm}^2$

  ✔ B.  $0.06 \text{ N/mm}^2 s$

  ✗ C.  $0.022 \text{ N/mm}^2$

  ✗ D.  $0.04 \text{ N/mm}^2$

Question ID : 931207193
Chosen Option : --

**Q.57** 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**
❌ A. 0.02 mm/ hour, 2

❌ B. 0.01 mm/ hour, 2

✅ C. 0.02 mm/ hour, 1.5

❌ D. 0.01 mm/ hour, 1.5

Question ID : 931207198
Chosen Option : --

**Q.58** As per IS 8041:1990, for rapid hardening cement, the setting time of cement when tested by the Vicat apparatus method is:

**Ans**
❌ A.
initial setting time shall not be less than 30 minutes and final setting time shall not be less than 600 minutes

❌ B.
initial setting time shall not be more than 10 minutes and final setting time shall not be more than 90 minutes

✅ C.
initial setting time shall not be less than 30 minutes and final setting time shall not be more than 600 minutes

❌ D.
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 : 3

**Q.59** Bernoulli's equation is NOT applicable for:

**Ans**
❌ A. Flow of ideal fluid with zero viscosity

✅ B. Incompressible flow

❌ C. One dimensional flow

❌ D. Rotational flow

Question ID : 931207207
Chosen Option : 4

**Q.60** 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**
❌ A. 51.505 m

❌ B. 49.200 m

❌ C. 50.000 m

✅ D. 49.505 m

Question ID : 931207158
Chosen Option : 4

**Q.61** In a prismatic compass:

**Ans** ✗ A. 90° is marked at the south end of the magnetic needle

✗ B. 180° is marked at the south end of the magnetic needle

✗ C.
0° is marked both at the south end as well as the north end of the magnetic needle

✔ D. 0° is marked at the south end of the magnetic needle

Question ID : **931207161**
Chosen Option : **4**

**Q.62** 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** ✗ A. 12.5%

✗ B. 20%

✔ C. 15%

✗ D. 10%

Question ID : **931207144**
Chosen Option : **--**

**Q.63** Stones are classified as under:

| Igneous | Sedimentary | Metamorphic |
|---------|-------------|-------------|
| Basalt  | Slate       | Gneiss      |
| Granite | Marble      | Lime stone  |

Which of the classifications are INCORRECT?

**Ans** ✗ A. Granite and marble

✗ B. Slate and gneiss

✗ C. Basalt and lime stone
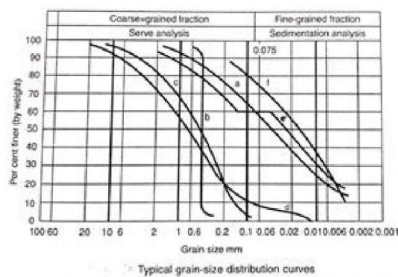
✔ D. Slate and lime stone

Question ID : **931207142**
Chosen Option : **4**

**Q.64** At least _____ of dissolved oxygen must be present in treated wastewater while discharging it into another water body.

**Ans**

&#10007; A. 2 ppm

&#10007; B. 8.4 ppm

&#10007; C. 7 ppm

&#10003; D. 4 ppm

Question ID : **931207225**
Chosen Option : **4**

**Q.65** In the following typical grain-size distribution curves for soil, curve 'b' indicates:



Typical grain-size distribution curves

**Ans**

&#10007; A. poorly graded soil

&#10007; B. predominantly fine grained soil

&#10007; C. gap graded soil

&#10003; D. uniform soil

Question ID : **931207175**
Chosen Option : **4**

**Q.66** The arbitrary limit of water content at which the soil tends to pass from the semi-solid to solid state is called:

**Ans**

&#10007; A. plastic limit

&#10007; B. plasticity index

&#10007; C. liquid limit

&#10003; D. shrinkage limit

Question ID : **931207176**
Chosen Option : **4**

**Q.67** 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 ✔ A. 28 kPa

✗ B. 0.09 kPa

✗ C. 14 kPa

✗ D. 35 kPa

Question ID : 931207202
Chosen Option : 3

**Q.68** The ratio of pH to pOH of freshly distilled water will be:

Ans ✗ A. 1.2

✗ B. 2

✗ C. 0.5

✔ D. 1

Question ID : 931207217
Chosen Option : 4

**Q.69** Which of the following is a correct statement with reference to determining reduced level of a point using rise and fall method?

Ans ✗ A.

If a staff reading (fore reading) is greater than that at the preceding point, then there is a rise.

✔ B.

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.

✗ C.

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.

✗ D.

If reading of a preceding point is greater, then there is a fall.

Question ID : 931207165
Chosen Option : 3

**Q.70** Using Rankine's formula, what is the minimum depth of foundation, if safe bearing capacity of soil is 90 kN/m² and unit weight 18 kN/m³ ? Take $\sin \phi = \frac{1}{3}$.

Where ϕ is angle of repose.

Ans ✗ A. 1.0 m

✗ B. 1.5 m

✔ C. 1.25 m

✗ D. 0.8 m

Question ID : 931207197
Chosen Option : 3

**Q.71** In which of the following is compass surveying NOT advisable?

Ans ✗ A.

When the area under survey cannot be divided into triangles conveniently.

✔ B. In places abounding in magnetic rock or iron ore.

✗ C. Survey of long narrow strips of roads, railways etc.

✗ D.

Where long straight lines and convenient tie lines cannot be drawn on account of obstructions.

Question ID : 931207160
Chosen Option : 2

**Q.72** 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 ✗ A. Both iii and iv

✔ B. ii, iii and iv

✗ C. Only i

✗ D. Only iv

Question ID : 931207196
Chosen Option : 2

**Q.73** How much shall be the compressive strength of OPC 53 Grade cement after 28 days of curing?

Ans ✗ A. 33 MPa

✔ B. 53 MPa

✗ C. 63 MPa

✗ D. 43 MPa

Question ID : 931207151
Chosen Option : 2

**Q.74** 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 ✗ A. grid meridian

✔ B. arbitrary meridian

✗ C. true meridian

✗ D. geographical meridian

Question ID : 931207159
Chosen Option : 2

**Q.75** Which of the following is INCORRECT with reference to Unconfined Compression Test on soil?

**Ans** ✔ A. This test cannot be performed on remoulded cohesive soil.

✘ B.

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.

✘ C. Failure plane is not predetermined.

✘ D. This test cannot be performed on coarse-grained soil.

Question ID : 931207191
Chosen Option : 1

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**Q.76** Seasoning of timber does NOT increases its:

**Ans** ✘ A. strength

✔ B. self-weight

✘ C. durability

✘ D. stiffness

Question ID : 931207155
Chosen Option : 2

---

**Q.77** Which of the following is true for compaction test on soil using light compaction under Indian standard compaction test?

**Ans** ✔ A. 26 N rammer falls through a height of 310 mm

✘ B. 12 N rammer falls through a height of 150 mm

✘ C. 48.9 N rammer falls through a height of 450 mm

✘ D. 48.9 N rammer falls through a height of 310 mm

Question ID : 931207195
Chosen Option : --

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**Q.78** $Imh_{off}$ cone is used to determine quantity of _____ in sewage.

**Ans** ✘ A. dissolved solids

✘ B. collide solids

✔ C. suspended settleable solids

✘ D. suspended non-settleable solids

Question ID : 931207224
Chosen Option : 3

**Q.79** A saturated soil sample can be represented by:

**Ans**

❌ A. one phase system

❌ B. three phase system

✅ C. two phase system

❌ D. no phase system

Question ID : **931207171**
Chosen Option : **2**

**Q.80** If reduced bearing of a line is N23° 20´W, then what will be the whole circle bearing?

**Ans**

❌ A. N336° 40´W

❌ B. 156° 40´

✅ C. 336° 40´

❌ D. N23° 20´W

Question ID : **931207162**
Chosen Option : **3**

**Q.81** Bulking of sand is more in:

**Ans**

✅ A. fine sand

❌ B. medium sand

❌ C. coarse sand

❌ D. gravelly sand

Question ID : **931207153**
Chosen Option : **1**

**Q.82** Autoclave test on cement is done to know:

**Ans**

❌ A. permeability of cement

❌ B. fineness of cement

✅ C. soundness of cement

❌ D. specific gravity of cement

Question ID : **931207143**
Chosen Option : **3**

**Q.83** In a plane table survey, scale selected is 1 cm = 100 m. If area plotted on the sheet is 200 cm$^2$, how much is the actual area on field?

**Ans**  ✔ A. 2000000 m$^2$

✘ B. 50000 m$^2$

✘ C. 0.2 km$^2$

✘ D. 20 km$^2$

Question ID : 931207164
Chosen Option : 3

**Q.84** 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**  ✘ A. 650 °C

✘ B. 105 °C to 120 °C

✔ C. 1100 °C

✘ D. 1400 °C

Question ID : 931207154
Chosen Option : 2

**Q.85** The Vane Shear Test is suitable for:

**Ans**  ✘ A. cohesion-less soil

✘ B. sandy soil

✔ C. clay

✘ D. gravely soil

Question ID : 931207192
Chosen Option : 3

**Q.86** In a tacheometer, stadia hairs are located on the:

**Ans**  ✘ A. stadia rod

✘ B. object glass

✔ C. diaphragm

✘ D. eye piece

Question ID : 931207170
Chosen Option : 3

**Q.87** Where rosin is used as resin in varnish, a suitable solvent will be:

Ans ✔ A. turpentine

✘ B. linseed oil

✘ C. wood naphtha

✘ D. methylated spirit of wine

Question ID : 931207146
Chosen Option : 4

**Q.88** The flow in a pipe is laminar if:

Ans ✘ A. Reynolds number is more than 6000

✘ B. Reynolds number is between 2000 and 4000

✘ C. Reynolds number is more than 4000

✔ D. Reynolds number is less than 2000

Question ID : 931207211
Chosen Option : 4

**Q.89** 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 ✔ A. deviation curve

✘ B. super elevation curve

✘ C. compound curve

✘ D. serpentine curve

Question ID : 931207167
Chosen Option : 4

**Q.90** Which of the following tests is NOT conducted on limestone?

Ans ✘ A. Heat test

✘ B. Ball test

✔ C. Stud pull-off test

✘ D. Acid test

Question ID : 931207149
Chosen Option : 2

Section : **Quantitative Aptitude & Logical Ability**

**Q.1** If $a - b = 2$ and $ab = 24$, then find $a^2 + b^2$.

**Ans**
- ✗ A. 46
- ✗ B. 54
- ✗ C. 48
- ✓ D. 52

Question ID : **931207237**
Chosen Option : **4**

**Q.2** By what number should $4^{-8}$ be multiplied to get 16?

**Ans**
- ✗ A. $4^{-2}$
- ✗ B. $4^5$
- ✗ C. $4^{-9}$
- ✓ D. $4^{10}$

Question ID : **931207231**
Chosen Option : **4**

**Q.3** Four letter-clusters have been given, out of which three are alike in some manner and one is different. Select the odd one.

**Ans**
- ✓ A. ABCI
- ✗ B. LMNP
- ✗ C. QRSU
- ✗ D. BCDF

Question ID : **931207250**
Chosen Option : **1**

**Q.4** 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**
- ✗ A. ₹13,400
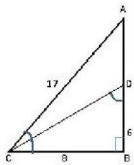- ✗ B. ₹12,000
- ✓ C. ₹14,500
- ✗ D. ₹15,200

Question ID : **931207233**
Chosen Option : **3**

**Q.5** In a certain code language, 'HOCKEY' is written as 'IQFOJE'. How will 'CRICKET' be written as in that language?

**Ans**
   ✗ A. DTNIRMC

   ✔ B. DTLGPKA

   ✗ C. DTKFOJZ

   ✗ D. DTMHQLB

Question ID : **931207247**
Chosen Option : **2**

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



**Ans**
   ✗ A. 8/17 and 8/9

   ✗ B. 6/17 and 4/5

   ✔ C. 15/17 and 4/5

   ✗ D. 15/17 and ¾

Question ID : **931207238**
Chosen Option : **3**

**Q.7** Find value of $\tan^2 30 + \sin^2 45$.

**Ans**
   ✗ A. $\dfrac{\sqrt{2}}{\sqrt{3}}$

   ✔ B. $\dfrac{2}{3}$

   ✗ C. $\dfrac{3}{2}$

   ✗ D. $\dfrac{\sqrt{3}}{\sqrt{2}}$

Question ID : **931207239**
Chosen Option : **1**

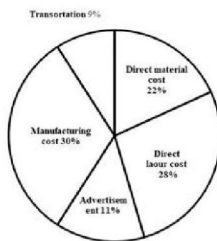**Q.8** Select the option that is related to the third term in the same way as the second term is related to the first term.

Bore : Augur :: Scoop :?

**Ans** ✗ A. Oar

✔ B. Shovel

✗ C. Tongs

✗ D. Axe

Question ID : **931207246**
Chosen Option : **1**

**Q.9** 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** ✗ A. ₹50

✗ B. ₹45

✗ C. ₹35

✔ D. ₹48

Question ID : **931207245**
Chosen Option : **4**

**Q.10** Select the number that can replace the question mark (?) in the following series.

4, 9, 14, 19,?

**Ans** ✗ A. 31

✗ B. 21

✗ C. 29

✔ D. 24

Question ID : **931207244**
Chosen Option : **4**

**Q.11** 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**

✗ A. $10 \frac{1}{2}$ minutes

✓ B. $12 \frac{1}{2}$ minutes

✗ C. 14 minutes

✗ D. 8 minutes

Question ID : **931207235**
Chosen Option : **2**

**Q.12** 20 men can do a painting in 30 days. How many men should be engaged to do the same painting in 24 days?

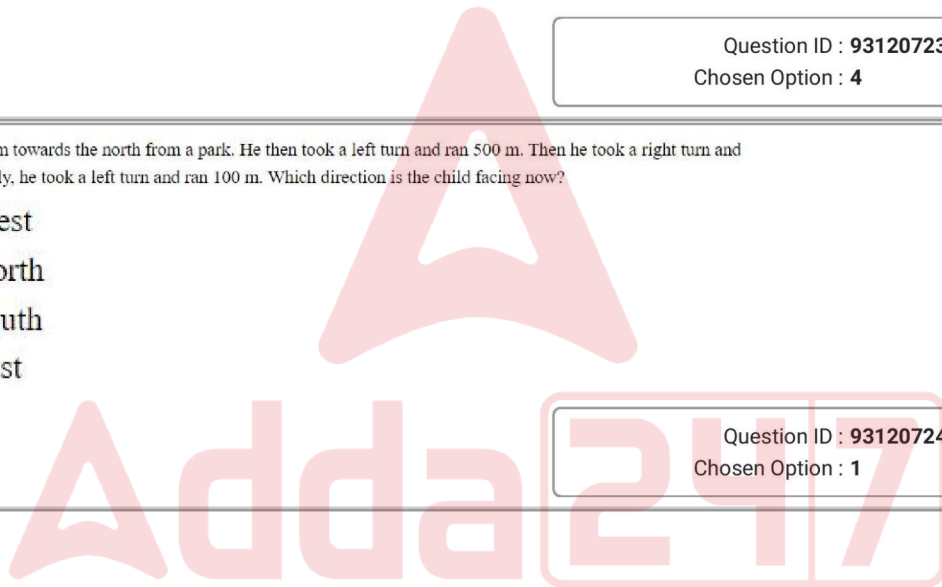**Ans** ✗ A. 27

✗ B. 24

✗ C. 22

✓ D. 25

Question ID : **931207234**
Chosen Option : **4**

**Q.13** 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** ✓ A. West

✗ B. North

✗ C. South

✗ D. East

Question ID : **931207248**
Chosen Option : **1**

**Q.14** Select the mirror image of the following figure from the given option figures.



Ans

✗ A. 

✗ B. 

✔ C. 

✗ D. 

Question ID : 931207242
Chosen Option : 3

**Q.15** 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?
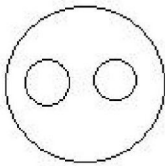
Ans ✗ A. D

✗ B. E

✔ C. B

✗ D. C

Question ID : 931207243
Chosen Option : 3

**Q.16** Select the Venn diagram that best represents the relationship between the following classes.
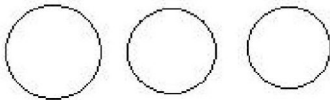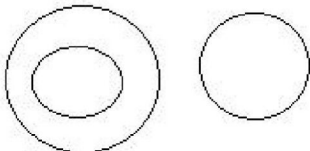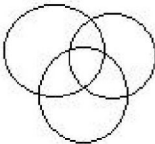
Dollar, Honey, Currency

Ans

✗ A. 

✗ B. 

✓ C. 

✗ D. 

Question ID : 931207249
Chosen Option : 3

**Q.17** A dealer marks his goods 25% above the cost price and gives a discount of 8%. Find the profit percentage.

Ans
✗ A. 25%
✓ B. 15%
✗ C. 17%
✗ D. 10%

Question ID : 931207232
Chosen Option : 2

**Q.18** 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
✗ A. 4
✗ B. 2
✓ C. 8
✗ D. 6

Question ID : 931207241
Chosen Option : 2

**Q.19** Without using tables find the value of $\dfrac{5 \sin 62°}{\cos 28°} - \dfrac{2 \sec 34°}{\csc 56°}$

Ans  ✗ A. 7

   ✔ B. 3

   ✗ C. 2

   ✗ D. 8

Question ID : 931207240
Chosen Option : 2

**Q.20** 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  ✗ A. $1296 \text{ cm}^2$

   ✔ B. $1369 \text{ cm}^2$

   ✗ C. $1325 \text{ cm}^2$

   ✗ D. $1310 \text{ cm}^2$

Question ID : 931207236
Chosen Option : 2

Section : **General English**

**Q.1** 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  ✔ A. He moves

   ✗ B. the cottage after

   ✗ C. the accident

   ✗ D. far away from

Question ID : 931207257
Chosen Option : --

**Q.2** Select the most appropriate meaning of the idiom underlined in the given sentence.

The Lilies bloom once in a blue moon.

Ans  ✗ A. a sign of bad luck

   ✗ B. a shade of the moon

   ✗ C. frequent incident

   ✔ D. a rare occurrence

Question ID : 931207258
Chosen Option : 4

**Q.3** Select the option that expresses the given sentence in passive voice.

Meena was peeling the potatoes.

Ans ✔ A. The potatoes were being peeled by Meena.

✘ B. The potatoes are peeled by Meena.

✘ C. The potatoes are being peeled by Meena.

✘ D. The potatoes were peeled by Meena.

Question ID : 931207252
Chosen Option : 1

**Q.4** Select the option that can be used as a one-word substitute for the given phrase.

The study of celestial bodies

Ans ✘ A. sociology

✘ B. entomology

✘ C. geology

✔ D. astronomy

Question ID : 931207260
Chosen Option : 2

**Q.5** 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 ✔ A.

Always remember to consider the consequences of every action you take.

✘ B.

To consider the consequences always remember you take of every action.

✘ C.

The consequences you take always remember of every action to consider.

✘ D.

Of every action the consequences you take always remember to consider.

Question ID : 931207259
Chosen Option : 1

**Q.6** 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  ✗ A. Dev has not

✔ B. yet understand

✗ C. the flaws in

✗ D. his master plan

Question ID : 931207251
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  ✗ A. is crashing

✗ B. crash

✔ C. crashed

✗ D. crashes

Question ID : 931207254
Chosen Option : 3

**Q.8** Select the option that expresses the given sentence in indirect speech.

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

Ans  ✔ A. Remy asked Tej whether he had spoken to Stella.

✗ B. Remy asked Tej if he was speaking to Stella.

✗ C. Remy asked Tej if he spoke to Stella.

✗ D. Remy asked Tej whether he has spoken to Stella.

Question ID : 931207253
Chosen Option : 1

**Q.9** Select the most appropriate ANTONYM of the given word.

FIGHT

Ans ✔ A. truce

✗ B. quarrel

✗ C. battle

✗ D. clash

Question ID : 931207256
Chosen Option : 1

**Q.10** Select the most appropriate synonym of the given word.

HUMBLE

Ans ✗ A. proud

✗ B. arrogant

✔ C. modest

✗ D. haughty

Question ID : 931207255
Chosen Option : 3

Section : **General Awareness**

**Q.1** What is the full form of UNEP?

Ans ✗ A. United Nations Economic Programme

✔ B. United Nations Environment Programme

✗ C. United Nations Educational Programme

✗ D. United Nations Environment Project

Question ID : 931207274
Chosen Option : 1

**Q.2** The book 'Mind Master: Winning Lessons from a Champion's Life' is co-authored by:

Ans ✔ A. Viswanathan Anand

✗ B. Satya Nadella

✗ C. Barack Obama

✗ D. VVS Laxman

Question ID : 931207268
Chosen Option : 4

**Q.3** Shown here is the image of the Meenakshi temple. Where is it located?



**Ans**
✗ A. Tirupati, Andhra Pradesh

✗ B. Tejpur, Assam

✗ C. Puri, Odisha

✔ D. Madurai, Tamil Nadu

Question ID : 931207261
Chosen Option : --

**Q.4** भारत के संविधान की किस अनुसूची में संघ सूची, राज्य सूची और समवर्ती सूची शामिल है?

**Ans**
✔ A. सातवीं अनुसूची

✗ B. पांचवी अनुसूची

✗ C. दूसरी अनुसूची

✗ D. दसवीं अनुसूची

Question ID : 931207269
Chosen Option : 3

**Q.5** The motion of a swing is an example of _____ motion.

**Ans**
✔ A. oscillatory

✗ B. curvilinear

✗ C. rectilinear

✗ D. rotatory

Question ID : 931207263
Chosen Option : 1

**Q.6** 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**
✔ A. Myanmar

✗ B. Indonesia

✗ C. China

✗ D. Bhutan

Question ID : 931207266
Chosen Option : 1

**Q.7** Bonalu is a Hindu festival of Telangana where Goddess _____ is worshipped.

Ans
✔ A. Mahakali
✘ B. Saraswati
✘ C. Lakhsmi
✘ D. Durga

Question ID : **931207271**
Chosen Option : **--**

**Q.8** Which of the following is defined as the number of females per 1000 males in the population?

Ans
✔ A. Sex ratio
✘ B. Birth rate
✘ C. Death rate
✘ D. Sex index

Question ID : **931207265**
Chosen Option : **1**

**Q.9** ROM के बारे में निम्नलिखित में से कौन सा सही नहीं है?

Ans
✘ A.
यह स्थैतिक होती है और इसे रिफ्रेश करने की आवश्यकता नहीं होती है
✘ B. इसका परीक्षण करना आसान है
✘ C. यह RAM से सस्ती होती है
✔ D. इसकी प्रकृति अस्थिर होती है

Question ID : **931207272**
Chosen Option : **4**

**Q.10** Ishwar Chandra Vidyasagar emphasised on:

Ans
✘ A. family planning
✘ B. abolition of dowry system
✘ C. women employment
✔ D. widow remarriage

Question ID : **931207277**
Chosen Option : **4**

**Q.11** IMPS, NEFT and RTGS are three platforms that enable instant money transfers. What is the full form of NEFT?

Ans
- ✗ A. National Electronic Foreign Transaction
- ✗ B. National Emergency Funds Transfer
- ✔ C. National Electronic Funds Transfer
- ✗ D. Nominal Electronic Funds Transfer

Question ID : **931207262**
Chosen Option : **3**

**Q.12** Which Article of the Constitution of India makes provision for free and compulsory education for children?

Ans
- ✗ A. 98
- ✗ B. 290
- ✗ C. 68
- ✔ D. 45

Question ID : **931207279**
Chosen Option : **--**

**Q.13** Curd (yogurt) is rich in:

Ans
- ✗ A. iron and sulphur
- ✗ B. potassium and magnesium
- ✗ C. sodium and chlorine
- ✔ D. calcium and phosphorus

Question ID : **931207264**
Chosen Option : **4**

**Q.14** Which of the following won the Safaigiri Award, 2019, for creating awareness and infrastructure in health and sanitation?

Ans
- ✔ A. Hindustan Unilever
- ✗ B. Water Literacy Foundation (WLF) and Ayyappa Masagi
- ✗ C. Siruthuli (an NGO)
- ✗ D. Global Interfaith WASH Alliance

Question ID : **931207278**
Chosen Option : **2**

**Q.15** Which of the following is NOT a step in drinking water treatment?

**Ans** ✗ A. Disinfection

✗ B. Sedimentation

✗ C. Coagulation and flocculation

✓ D. Decantation

Question ID : **931207273**
Chosen Option : **4**

**Q.16** The Congress-League Scheme, 1916, is also known as the:

**Ans** ✗ A. Delhi pact

✓ B. Lucknow pact

✗ C. Kanpur pact

✗ D. Allahabad pact

Question ID : **931207267**
Chosen Option : **2**

**Q.17** What is the type of farming that relies on crop rotation, green manure, compost, biological pest control and mechanical cultivation?

**Ans** ✗ A. Multicrop farming

✗ B. Vertical farming

✗ C. Polyhouse farming

✓ D. Organic farming

Question ID : **931207276**
Chosen Option : **4**

**Q.18** Which of the following players received the Lifetime Achievement Award in Sports in September 2019?

**Ans** ✗ A. Sunil Chhetri

✓ B. Manuel Fredricks

✗ C. Smriti Mandhana

✗ D. Pulella Gopichand

Question ID : **931207270**
Chosen Option : **1**

**Q.19** 'रासायनिक रूप से, ये मिट्टी चूना, लोहा, मैग्नेशिया और एल्यूमिना में समृद्ध होती है। इसमें पोटाश भी शामिल होता है। लेकिन उनमें फॉस्फोरस, नाइट्रोजन और कार्बनिक पदार्थों की कमी होती है।' मिट्टी के इस प्रकार का नाम बताएं।

**Ans**

  ✗ A. जलोढ़ मिट्टी

  ✗ B. लैटेराइट मिट्टी

  ✔ C. काली मिट्टी

  ✗ D. शुष्क मिट्टी

> Question ID : 931207275
> Chosen Option : 2

**Q.20** यूसीआई (UCI) विश्व चैंपियनशिप _____ की प्रतियोगिता है।

**Ans**

  ✗ A. मुक्केबाज़ी

  ✔ B. साइकिलिंग

  ✗ C. बोटिंग

  ✗ D. क्रिकेट

> Question ID : 931207280
> Chosen Option : 2