	Delhi Development Authority **(Recruitment Cell)** Advertisement No. 03/2022/Rectt.Cell./Pers./DDA	
Participant ID		
Participant Name		
Test Center Name	iON Digital Zone iDZ 1 GT Karnal Road	
Test Date	29/03/2023	
Test Time	4:30 PM - 6:30 PM	
Subject	Junior Engineer (Civil)	

Section : **Domain Questions**

Q.1 The total number of test strength samples required for concrete mix design to constitute an acceptable record for calculation of standard deviation shall be not less than _____ .

Ans ✔ 1. 30

✘ 2. 20

✘ 3. 25

✘ 4. 10

Question ID : **630680197358**
Status : **Answered**
Chosen Option : **1**

Q.2 Slenderness Limit for cantilever beams to ensure lateral stability, the clear distance from the free end of the cantilever to the lateral restraint as per IS 456-2000 shall NOT exceed:

Where, 'd' is the effective depth of the beam and 'b' is the breadth of the compression face midway between the lateral restraints.

Ans ✘ 1. $60b$ OR $\frac{250b^2}{d}$ whichever is less

✘ 2. $40b$ OR $\frac{200b^2}{d}$ whichever is less

✘ 3. $15b$ OR $\frac{50b^2}{d}$ whichever is less

✔ 4. $25b$ OR $\frac{100b^2}{d}$ whichever is less

Question ID : **630680197393**
Status : **Answered**
Chosen Option : **4**

Q.3 Statistical based quality control for concrete is carried out for a highway project in which 37 concrete samples were tested randomly. The average strength was found to be 40 MPa with a square of deviation of 400 MPa^2. What is the standard deviation of the test samples?

Ans
✗ 1. 4.33 MPa

✗ 2. 8.33 MPa

✗ 3. 6.33 MPa

✔ 4. 3.33 MPa

Question ID : **630680197364**

Status : **Not Attempted and Marked For Review**

Chosen Option : **--**

Q.4 Which of the following apparatuses is used for finding the initial setting and final setting time of cement paste?

Ans
✗ 1. Le Chatelier's apparatus

✔ 2. Vicat apparatus

✗ 3. Kelli ball apparatus

✗ 4. Los Angeles apparatus

Question ID : **630680197361**

Status : **Answered**

Chosen Option : **2**

Q.5 Match the following sewer appurtenances with their purpose.

Sewer appurtenances	purpose
1. Manholes	A. An inclined pipe extended from ground surface and connected to the underground sewer through which sewer will be cleaned
2. Lamp holes	B. A street inlet provided to collect grit, sand , debris
3. Cleanouts	C. To provide access to sewer so that inspection, cleaning and maintenance can be done
4. Catch basins	D. To check the obstructions in sewer

Ans
✔ 1. 1-C, 2-D, 3-A, 4-B

✗ 2. 1-C, 2-A, 3-D, 4-B

✗ 3. 1-D, 2-C, 3-A, 4-B

✗ 4. 1-C, 2-D, 3-B, 4-A

Question ID : **630680197405**

Status : **Answered**

Chosen Option : **1**

Q.6 Which of the following statements is/are correct/incorrect?

Statement A: Brittle material is strong in compression but weak in tension.

Statement B: Ductile material is approximately equally strong tension and shear, but weak in compression.

Ans ✗ 1. Both Statements A and B are incorrect

✗ 2. Both Statements A and B are correct

✔ 3. Only Statement A is correct

✗ 4. Only Statement B is correct

Q.7 Soils are classified into 8 groups of coarse-grained, 9 groups of fine-grained and one of peat in which type of soil classification?

Ans ✗ 1.
Massachusetts Institute of Technology classification system

✔ 2. Indian standard classification system

✗ 3. Unified soil classification system

✗ 4. AASHTO soil classification system

Q.8 The maximum shear stress of a rectangular cross-section of the beam is _____.

Ans ✗ 1. 1.5 times the bending stress from the extreme top fibre

✔ 2. 1.5 times the average shear stress

✗ 3. 1.5 times the average bending moment

✗ 4. 1.5 times the bending stress from the extreme bottom fibre

Q.9 A metallic rod of 10 mm diameter is bent into a circular form of radius 5 m. If the maximum bending stress developed in the rod is 125 MPa, find the value of Young's modulus of the material.

Ans ✗ 1. 150 GPa

✔ 2. 125 GPa

✗ 3. 115 GPa

✗ 4. 135 GPa

Q.10 The conditions required for maximum discharge through a triangular channel having a depth of flow y are:

Ans ✗ 1.

each sloping side makes an angle of 60° with the vertical and hydraulic mean radius $= \frac{y}{\sqrt{2}}$

✗ 2.

each sloping side makes an angle of 60° with the vertical and hydraulic mean radius $= \frac{y\sqrt{2}}{2}$

✔ 3.

each sloping side makes an angle of 45° with the vertical and hydraulic mean radius $= \frac{y}{2\sqrt{2}}$

✗ 4.

each sloping side makes an angle of 30° with the vertical and hydraulic mean radius $= \frac{y}{\sqrt{2}}$

Question ID : **630680197380**
Status : **Answered**
Chosen Option : **3**

Q.11 Match the following water distribution system with their characteristics.

Distribution system	Characteristics
1. Dead end system	A. Water enters the branches at all junctions in either directions into submains of equal diameters
2. Grid iron system	B. Supply to the inner pipes is from the mains around the boundary
3. Circular or ring system	C. Most economical system if combined pumping and gravity flow is adopted
4. Radial system	D. System is suitable for irregular developed or developing towns or cities

Ans ✗ 1. 1-B, 2-A, 3-D, 4-C

✗ 2. 1-D, 2-C, 3-B, 4-A

✔ 3. 1-D, 2-A, 3-B, 4-C

✗ 4. 1-D, 2-B, 3-A, 4-C

Question ID : **630680197408**
Status : **Answered**
Chosen Option : **3**

Q.12 Wastewater is treated in the sedimentation stage which is divided into four types as shown in the figure.

Match the following process of sedimentation corresponding to type I, II, III and IV against A, B, C, and D.

Hindered settling, discrete setting, compression settling and Flocculant settling.

Based on this, select the correct option
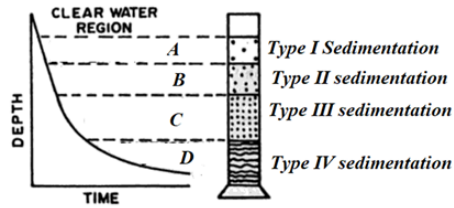
Ans ✗ 1.

A-Discrete settling, B- Hindered Setting, C - Flocculant settling, D-Compression settling

✗ 2.

A- Flocculant settling, B - Discrete settling, C-Hindered Setting, D-Compression settling

✗ 3.

A-Discrete settling, B- Compression settling, C-Hindered Setting, D- Flocculant settling

✔ 4.

A-Discrete settling, B-Flocculant settling, C-Hindered Setting, D-Compression settling
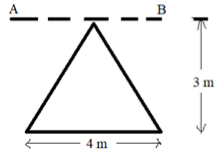
Question ID : 630680197409
Status : **Answered**
Chosen Option : **4**

Q.13 What is the purpose of providing a shear key in the design of the RCC retaining wall?

Ans ✗ 1.

To enhance the drainage by reducing pore water pressure from backfill and uplift pressure from the foundation

✗ 2.

to increase the overturning moment due to active earth pressure so as to reduce the factor of safety

✗ 3.

To reduce the pore water pressure induced by backfill and surcharge

✔ 4.

To enhance factor safety against sliding due to active earth pressure induced by backfill and surcharge

Question ID : 630680197395
Status : **Answered**
Chosen Option : **4**

Q.14 Find the moment of inertia of a triangle of height 3 m about an axis (AB) at the vertex as shown in the figure parallel to the base (4 m) of the triangle.

Ans
  ✗ 1. 81 m^4

  ✗ 2. 9 m^4

  ✗ 3. 3 m^4

  ✔ 4. 27 m^4

Q.15 Water is used as thinner in which type of paint?

Ans
  ✗ 1. Asbestos paint

  ✔ 2. Plastic paint

  ✗ 3. Bituminous paint

  ✗ 4. Cellulose paint

Q.16 RCC structures such as beams are to be designed by the working stress method. Which of the following expressions is used to check the effective depth (d) of the section?

Where M- service load moment; b- width or breadth of the section; Q- design constant

Ans

✔ 1. $d = \sqrt{\dfrac{M}{Qb}}$

✘ 2. $d = \sqrt{\dfrac{Mb}{Q}}$

✘ 3. $d = \sqrt{\dfrac{Qb}{M}}$

✘ 4. $d = \sqrt{\dfrac{QM}{b}}$

Q.17 The condition at which cavitation occurs in ogee spillway is when:

Ans ✘ 1.
the designed head on the spillway is more than the operating head

✘ 2.
the flow over the spillway changes from super-critical to sub-critical condition

✔ 3.
the operating head on the spillway is more than the designed head

✘ 4.
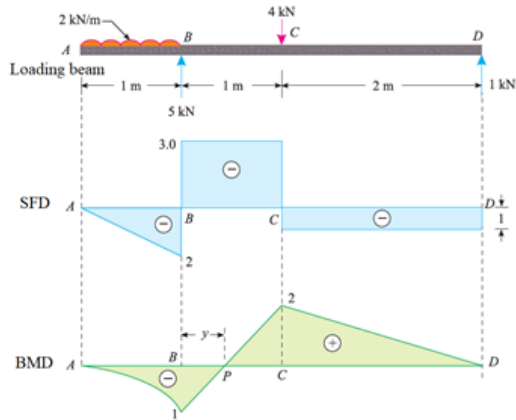the inflow discharge on the spillway is less than the outflow discharge

Q.18 The loading beam, shear force and bending moment diagrams are given below.

Find the value of 'y' (contraflexture point) from point B.

Ans
✓ 1. 0.33 m

✗ 2. 0.44 m

✗ 3. 0.22 m

✗ 4. 0.55 m

Q.19 Match the following hydraulic machineries and their types of operating principles.

Hydraulic machinery	Type of operating principle
1. Centrifugal pump	A. Positive displacement
2. Reciprocating pump	B. Axial flow
3. Pelton wheel	C. Priming
4. Kaplan turbine	D. Impulse

Ans
✗ 1. 1-C, 2-B, 3-D, 4-A

✓ 2. 1-C, 2-A, 3-D, 4-B

✗ 3. 1-B, 2-A, 3-D, 4-C

✗ 4. 1-C, 2-D, 3-A, 4-B

Q.20 The bearing capacity of soil supporting an isolated footing of size 3 m × 3m will be affected by the presence of a water table located at a depth of _____below the base of the footing.

Ans
✔ 1. 1.5 m
✖ 2. 5.5 m
✖ 3. 3.5 m
✖ 4. 4.0 m

Q.21 The placing of concrete in an underwater environment, which of the following methods or techniques is NOT suitable?

Ans
✖ 1. Grouting method
✔ 2. Chute method
✖ 3. Tremie method
✖ 4. Bucket placing method

Q.22 A composite T-section beam shown in the figure is subjected to a moment of 11 kN-m around the horizontal neutral axis which develops tension below the neutral axis. Find the bending stresses at both extreme fibres of the cross-section of the beam. The centroidal distance of 75 mm from the top and 125 mm from the bottom edges is also shown in the figure. Take a moment of inertia equal to 55×10^6 mm^4.

All dimensions are in mm
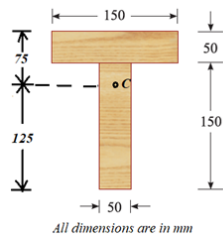
Ans
✖ 1.
Bending stress at top fibre = 15 MPa (tension) and bending stress at bottom fibre = 25 MPa (compression)

✖ 2.
Bending stress at top fibre = 25 MPa (Tension) and bending stress at bottom fibre = 15 MPa (Compression)

✖ 3.
Bending stress at top fibre = 25 MPa (compression) and bending stress at bottom fibre = 15 MPa (Tension)

✔ 4.
Bending stress at top fibre = 15 MPa (compression) and bending stress at bottom fibre = 25 MPa (Tension)

Q.23 The placing of mass concrete in lightly reinforced sections in beams, columns and slabs with a low degree of workability, the slump of such concrete as per IS 456-2000 is _____.

Ans ✗ 1. 10 to 25 mm

✔ 2. 25 to 75 mm

✗ 3. 75 to 100 mm

✗ 4. 100 to 150 mm

Q.24 Consider the following arrangements in multistage centrifugal pump and select the correct option.

1. Impellers are connected in series to produce high head.

2. Impellers are connected in parallel to discharge a large quantity of liquid.

Ans ✔ 1. Both 1 and 2 are true.

✗ 2. 1 is false and 2 is true.

✗ 3. Both 1 and 2 are false.

✗ 4. 1 is true and 2 is false.

Q.25 Circular mild steel of cross-sectional area 'A' and length 'L' is subjected to an axial pull 'P'. What is the elongation of the bar (ΔL) if the young's modulus of elasticity of materials is 'E'?

Ans ✔ 1. $\Delta L = \dfrac{PL}{AE}$

✗ 2. $\Delta L = \dfrac{AE}{PL}$

✗ 3. $\Delta L = \dfrac{PA}{LE}$

✗ 4. $\Delta L = \dfrac{PE}{AL}$

Q.26 According to IS 456-2000, the maximum permissible limit of Chlorides present in freshwater used for reinforced concrete work is _____.

Ans ✗ 1. 1000 mg/l

✗ 2. 200 mg/l

✗ 3. 2000 mg/l

✓ 4. 500 mg/l

Q.27 What is the effective length of a prismatic compression steel member of unsupported length L restrained against rotation and translation at one end and free against translation but restrained for rotation at the other end?

Ans ✗ 1. 0.65 L

✗ 2. 1.5 L

✓ 3. 1.2 L

✗ 4. 2.0 L

Q.28 A fixed beam AB is subjected to a uniformly varying load as shown in the figure. Find the fixed end moments.
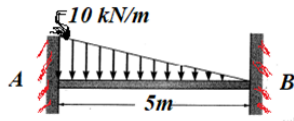
Ans ✗ 1. $FEM_{AB} = -8.33$ kN-m and $FEM_{BA} = 6.33$ kN-m

✓ 2. $FEM_{AB} = -12.5$ kN-m and $FEM_{BA} = 8.33$ kN-m

✗ 3. $FEM_{AB} = -6.25$ kN-m and $FEM_{BA} = 11.11$ kN-m

✗ 4. $FEM_{AB} = -18.5$ kN-m and $FEM_{BA} = 0$ kN-m

Q.29 A square hole is made out of circular lamina, the diagonal of the square being the radius of the circle as shown in the figure. Find the location of the centroid (*distance $\bar{X}$*) with respect to point 'A'.
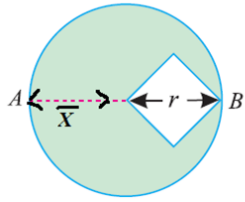
Ans

✓ 1. $\bar{X} = \dfrac{r(\pi - 0.75)}{(\pi - 0.5)}$

✗ 2. $\bar{X} = \dfrac{(\pi - 0.75)}{r(\pi - 0.5)}$

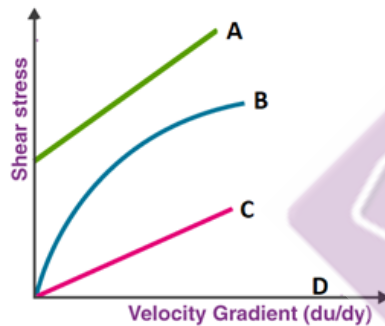✗ 3. $\bar{X} = \dfrac{r(\pi - 0.75)}{2(\pi - 0.5)}$

✗ 4. $\bar{X} = \dfrac{(\pi - 0.75)}{(r - 0.5)}$

Q.30 In the given figure, which of the following lines shows the 'ideal plastic fluid'?

Ans

✗ 1. D

✗ 2. B

✗ 3. C

✓ 4. A

Q.31 Match the following types of cement with their uses and select the correct option.

Type of cement	Uses
1. Rapid hardening cement	A. Refractory concrete in industries
2. Quick setting cement	B. Dam construction
3. High Alumina cement	C. Underwater Concretion
4. Low heat Portland cement	D. Repair of bridges

Ans
✗ 1. 1-C, 2-D, 3-A, 4-B

✗ 2. 1-B, 2-C, 3-A, 4-D

✔ 3. 1-D, 2-C, 3-A, 4-B

✗ 4. 1-D, 2-C, 3-B, 4-A

Q.32 Which of the following is NOT a use of a contour map?

Ans
✔ 1. Measurement of height of an object

✗ 2. Measurement of the drainage area

✗ 3. Tracing location of route

✗ 4. Calculation of reservoir capacity

Q.33 Which of the following statements is NOT correct with respect to the slow sand filter in the drinking water treatment plant?

Ans
✗ 1.
The effective size of sand used is in the range between 0.15 and 0.3 mm.

✗ 2.
Slow sand filtration is suitable when raw water turbidity does not exceed 30 NTU, EXCEPT occasionally for a few days.

✗ 3. It removes bacteria effectively up to 90%.
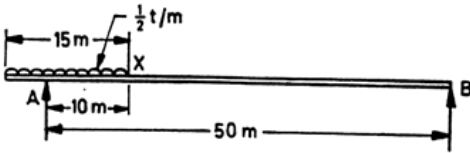
✔ 4. Backwashing is used for cleaning the filter bed.

Q.34 The maximum permissible limit of calcium concentration present in drinking water in the absence of an alternate source of water as per IS code 10500-2012 is _____.

Ans
- ✗ 1. 100 mg/l
- ✗ 2. 75 mg/l
- ✓ 3. 200 mg/l
- ✗ 4. 30 mg/l

Q.35 In the given figure, a UDL load of 0.5 T/m is applied on the beam. Find the maximum positive shear force.

Ans
- ✗ 1. 5 T
- ✗ 2. 15 T
- ✓ 3. 0.5 T
- ✗ 4. 7.5 T

Q.36 The total volume of the soil sample is 50 ml. Find the void ratio if the volume of solids is 30 ml.

Ans
- ✓ 1. 66.67%
- ✗ 2. 56.67%
- ✗ 3. 86.67%
- ✗ 4. 76.67%

Q.37 What is the main purpose of providing a ventilation column in the sewerage line?

Ans
- ✗ 1. To make provision for a person to enter inside for cleaning
- ✓ 2. To clear off the foul gas generated in the sewage while flowing
- ✗ 3. To provide sunlight inside the sewer line
- ✗ 4. To allow stormwater into the sewer

Q.38 The particle size analysis of fine grained soils can be more accurately determined in the laboratory by the _____.

Ans

✗ 1. sand bath method

✗ 2. pycnometer method

✔ 3. pipette method

✗ 4. cone penetrometer method

Question ID : **630680197365**
Status : **Answered**
Chosen Option : **3**

Q.39 According to IS 73-2013, which of the following characteristics is constant for all grades of paving bitumen grades such as VG10, VG20, VG30 and VG40?

Ans

✗ 1. Penetration

✗ 2. Softening point

✗ 3. Ductility

✔ 4. Flash point

Question ID : **630680197332**
Status : **Answered**
Chosen Option : **4**

Q.40 Which of the following admixtures is NOT matched with respective chemicals?

1. Plasticizers : Acrylic polymer

2. Retarders : Calcium sulphate

3. Accelerators : Silica Fume

4. Air entraining admixtures : Animal and vegetable fats and oils

Ans

✗ 1. 2

✔ 2. 3

✗ 3. 1

✗ 4. 4

Question ID : **630680197362**
Status : **Answered**
Chosen Option : **2**

Q.41 Two plates are placed 1.5 cm apart horizontally and filled the gap between them with an oil of viscosity 1.5 N-s/m^2.
What is the shear stress in oil if the upper plate is moved with a velocity of 3 m/s?

Ans   ✗ 1. 315 N/m^2

     ✗ 2. 250 N/m^2

     ✗ 3. 275 N/m^2

     ✔ 4. 300 N/m^2

Question ID : **630680197376**
Status : **Answered**
Chosen Option : **4**

Q.42 The following statements are related to the sewers. Select the correct option from the following.

1. Circular sewers are suitable only where a variation of discharge is not large, thus suitable even for a combined sewerage system.

2. Oval shape sewers are suitable for a combined sewerage system as they carry varying discharges.

Ans   ✗ 1.   Both statements 1 and 2 are false.

     ✔ 2.   Statement 1 is false and 2 is true.

     ✗ 3.   Both statements 1 and 2 are true.

     ✗ 4.   Statement 1 is true and 2 is false.

Question ID : **630680197406**
Status : **Answered**
Chosen Option : **2**

Q.43 Which of the following expressions is correct for the elongation in bar due to the self-weight? (W = weight, L = length of bar, E = Young's modulus of material of bar)

Ans   ✗ 1.   elongation $=\dfrac{W}{2E}$

     ✗ 2.   elongation $=\dfrac{W}{2EL}$

     ✗ 3.   elongation $=\dfrac{L}{2WE}$

     ✔ 4.   elongation $=\dfrac{WL}{2E}$

Question ID : **630680197349**
Status : **Answered**
Chosen Option : **4**

Q.44 In which of the following compaction tests for soil, are the mass of rammer and a free drop to compact 4.9 kg and 450 mm, respectively?

Ans ✗ 1. Standard proctor test

✔ 2. Heavy compaction test

✗ 3. Jodhpur mini compactor test

✗ 4. Abbot compaction test

Question ID : **630680197371**
Status : **Answered**
Chosen Option : **2**

Q.45 Select the INCORRECT characteristic of contour lines from the following.

Ans ✗ 1.
Two contour lines of different elevations cannot cross each other except in the case of an overhanging cliff or a cave.

✗ 2.
Contour lines of different elevations can unite to form one line in a vertical cliff.

✔ 3. Contour lines are parallel to the watershed line.

✗ 4.
A contour passes through any point perpendicular to the line of the steepest slope at that point.

Question ID : **630680197343**
Status : **Marked For Review**
Chosen Option : **2**

Q.46 According to IS456-2000, the slenderness limits for RCC columns having an unsupported length between end restraints shall NOT exceed _____ times the least lateral dimension of a column.

Ans ✗ 1. 40

✗ 2. 30

✗ 3. 50

✔ 4. 60

Question ID : **630680197391**
Status : **Answered**
Chosen Option : **1**

Q.47 A soil has a plastic limit of 20% and a plasticity index of 10%. Find the liquidity index if the water content of the soil in its natural condition in the field is 25%.

Ans ✗ 1. 80%

✗ 2. 75%

✗ 3. 60%

✔ 4. 50%

Question ID : **630680197368**
Status : **Answered**
Chosen Option : **4**

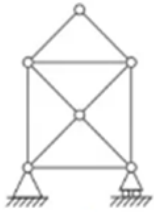**Q.48** Convert quadrantal bearing S 31°36' E to whole circle bearing.

Ans
✗ 1. 120° 36'

✔ 2. 148° 24'

✗ 3. 210° 36'

✗ 4. 329° 36'

Question ID : **630680197341**
Status : **Answered**
Chosen Option : **2**

Q.49 Identify the following truss shown in the figure in which diagonal members are connected.

Ans
✗ 1. statically determinate and unstable

✔ 2. statically indeterminate and stable

✗ 3. statically determinate and stable

✗ 4. statically indeterminate and unstable

Question ID : **630680197384**
Status : **Answered**
Chosen Option : **2**

Q.50 A manometer containing mercury and water has a gauge difference of 500 mm. What is the difference in pressure?

Ans
✗ 1. 9.3 m of water

✗ 2. 7.3 m of water

✗ 3. 8.3 m of water

✔ 4. 6.3 m of water

Question ID : **630680197374**
Status : **Not Attempted and Marked For Review**
Chosen Option : **--**

Q.51 Select the correct statement with respect to the concept of equivalent pipe used in flow through pipes.

Ans ✓ 1.
The discharge and loss of head in the equivalent pipe are equal to the sum of the discharges and loss of head of a compound pipe consisting of several pipes of different lengths.

✗ 2.
The length of an equivalent pipe is equal to the sum of the lengths of the compound pipe consisting of different pipes and not equal to the sum of the head loss of compound pipes.

✗ 3.
The velocity of flow in the equivalent pipe is equal to the sum of the velocities of the compound pipe consisting of different pipes.

✗ 4.
The diameter of the equivalent pipe is equal to the sum of the diameter of a compound pipe consisting of different pipes.

Question ID : **630680197377**
Status : **Answered**
Chosen Option : **2**

Q.52 The average compressive strength of a class-10 burnt clay brick as per IS 1077-1992 should NOT be less than _____.

Ans ✗ 1. 20 N/mm^2

✗ 2. 30 N/mm^2

✓ 3. 10 N/mm^2

✗ 4. 40 N/mm^2

Question ID : **630680197330**
Status : **Answered**
Chosen Option : **3**

Q.53 Which of the following pairs is correctly matched in case of defects and causes of wood?

Defects	Causes
A. Heart shake	Serve frost and fierce heat by sun
B. Cup shake	Excessive frost action on the sap present in tree
C. Star shake	Irregular cutting of branch
D. Upsets	Basis of branches buried by cambial activity of mother branch

Ans ✗ 1. A

✗ 2. D

✓ 3. B

✗ 4. C

Question ID : **630680197336**
Status : **Answered**
Chosen Option : **3**

Q.54 An alloy having values of modulus of elasticity and Poisson's ratio of 150 GPa and 0.25, respectively. Find the value of the bulk modulus of the alloy.

Ans
✗ 1. 125 GPa

✗ 2. 150 GPa

✗ 3. 220 GPa

✔ 4. 100 GPa

Q.55 The type of soil stabilisation used to improve the properties of soil by altering its gradation is called _____.

Ans
✔ 1. mechanical stabilisation

✗ 2. cement stabilisation

✗ 3. bituminous stabilisation

✗ 4. electrical stabilisation

Q.56 The design strength of steel members under axial tension, T_{dg} as governed by yielding of the gross section, as per IS 800:2007, is given by:

Where, f_y is the yield stress of the material, A_g is the gross area of cross-section, and γ_{mo} is the partial safety factor for failure in tension by yielding.

Ans
✔ 1. $T_{dg} = \dfrac{A_g f_y}{\gamma_{mo}}$

✗ 2. $T_{dg} = \dfrac{\gamma_{mo} f_y}{A_g}$

✗ 3. $T_{dg} = \dfrac{f_y}{A_g \gamma_{mo}}$

✗ 4. $T_{dg} = \dfrac{\gamma_{mo}}{A_g f_y}$

Q.57 Identify the roof truss shown in the figure.
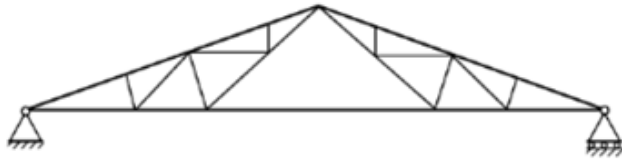
Ans
- ✔ 1. French truss
- ✘ 2. Howe truss
- ✘ 3. Pratt truss
- ✘ 4. Kingpost truss

Q.58 As per IS 456-2000, the minimum transverse reinforcement shall be _____ for a slab which is assumed to act as a compression flange of a T-beam.

Consider that the main reinforcement of the slab parallel to the beam is $500mm^2/m$.

Ans
- ✘ 1. $350 \ mm^2/m$
- ✘ 2. $250 \ mm^2/m$
- ✘ 3. $400 \ mm^2/m$
- ✔ 4. $300 \ mm^2/m$

Q.59 Which of the following statements is INCORRECT with respect to the workability of fresh concrete?

Ans
- ✘ 1.
  The higher the aggregate/cement ratio, the leaner is the concrete.
- ✘ 2.
  The higher the water content per cubic meter of concrete, the higher will be the fluidity of concrete.
- ✘ 3.
  The fine, glassy pozzolanic materials offer better lubricating effects and give better workability.
- ✔ 4.
  Flaky aggregate makes the concrete more workable than rounded aggregates.

Q.60 Which of the following type of cement hydrates at relatively low rate and liberate less heat when compared to other mentioned types?

Ans
- ✗ 1. Ordinary Portland cement
- ✓ 2. Portland Pozzolana cement
- ✗ 3. Rapid hardening Portland cement
- ✗ 4. Quick set cement

Question ID : **630680197337**
Status : **Answered**
Chosen Option : **2**

Q.61 Which of the following is NOT a mode of failure of an axially loaded RCC column?

Ans
- ✗ 1. Combined compression and bending failure
- ✗ 2. Failure by elastic instability
- ✓ 3. Failure by punching
- ✗ 4. Pure compression failure

Question ID : **630680197398**
Status : **Answered**
Chosen Option : **2**

Q.62 According to IS – 800-2007, the maximum slenderness ratio for steel tension members in which reversal of direct stress occurs due to loads other than wind or seismic forces occur is _____.

Ans
- ✗ 1. 150
- ✗ 2. 350
- ✓ 3. 180
- ✗ 4. 400

Question ID : **630680197396**
Status : **Answered**
Chosen Option : **3**

Q.63 Match the following types of stiffeners and their functions in the case of a plate girder.

Type of stiffener	function
1. Load carrying stiffener	A. To prevent local crushing of the web due to concentrated loading
2. Bearing stiffener	B. To prevent local buckling of the web due to concentrated loading
3. Diagonal stiffener	C. To improve the buckling strength of a slender web due to shear
4. Intermediate transverse web stiffener	D. To provide local reinforcement to a web under shear and bearing

Ans ✗ 1. 1-D, 2-A, 3-B, 4-C

✔ 2. 1-B, 2-A, 3-D, 4-C

✗ 3. 1-B, 2-D, 3-A, 4-C

✗ 4. 1-C, 2-A, 3-D, 4-B

Q.64 Which of the following types of varnishes is generally used for varnishing maps and pictures?

Ans ✗ 1. Flat varnish

✗ 2. Oil varnish

✔ 3. Water varnish

✗ 4. Spar varnish

Q.65 In a traverse surveying, the direction of a line AB of length 150 m measured in the whole circle bearing system is found to be 60°00'. Calculate its latitude.

Ans ✗ 1. 100 m

✗ 2. 150 m

✗ 3. 50 m

✔ 4. 75 m

Q.66 The horizontal axis of a theodolite about which the telescope and the vertical circle rotate in a vertical plane is also called the _____.

Ans
✗ 1. line of sight

✗ 2. instrument centre

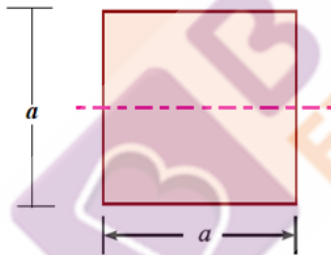✗ 3. line of collimation

✔ 4. trunnion axis

Q.67 Darcy's law is applicable for which type of soils?

Ans
✔ 1. Fine sand

✗ 2. Coarse aggregates

✗ 3. Boulders

✗ 4. Gravel

Q.68 What is the section modulus of a square section of side equal to 'a' as shown in the figure?

Ans
✔ 1. $\dfrac{a^3}{6}$

✗ 2. $\dfrac{a^2}{6}$

✗ 3. $\dfrac{a}{6}$

✗ 4. $\dfrac{a^4}{6}$

Q.69 A subtense bar in a tacheometric survey is used to measure the _____.

Ans

✔ 1. horizontal distance between two points

✘ 2. bearing of a point with respect to North

✘ 3. elevation of a point with respect to mean sea level

✘ 4. slope of terrain

**Q.70** The primary properties of a building materials are:

Density, specific weight, hardness, durability, elasticity and strength.

Select only the mechanical properties from the following options.

Ans

✔ 1. Strength, hardness, elasticity

✘ 2. Specific weight, strength, hardness

✘ 3. Density, durability, hardness

✘ 4. Strength, durability, hardness

Q.71 A beam shown in figure AB carries a moment M_o at point C. Support A is Hinged and B is a roller. What is the bending moment at C to its left and right?
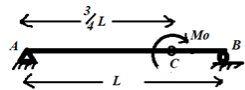
Ans ✘ 1.

$$Bending\ Moment\ at\ C - Left = \frac{L}{4}M_o \ and\ Bending\ Moment\ at\ C - Right = -\frac{3L}{4}M_o$$

✔ 2.

$$Bending\ Moment\ at\ C - Left = \frac{1}{4}M_o \ and\ Bending\ Moment\ at\ C - Right = -\frac{3}{4}M_o$$

✘ 3.

$$Bending\ Moment\ at\ C - Left = -\frac{3L}{4}M_o \ and\ Bending\ Moment\ at\ C - Right = \frac{L}{4}M_o$$

✘ 4.

$$Bending\ Moment\ at\ C - Left = -\frac{3}{4}M_o \ and\ Bending\ Moment\ at\ C - Right = \frac{1}{4}M_o$$

Q.72 Two points A and B are 1530 m apart across a wide river. The following reciprocal levels are taken with one level. Calculate the true difference in level between A and B.

Level at	Reading on A	Reading on B
A	2.165	3.810
B	0.910	2.355

Ans ✗ 1. 3.255 m

✗ 2. 3.085 m

✓ 3. 1.545 m

✗ 4. 2.260 m

Question ID : **630680197346**

Status : **Not Attempted and Marked For Review**

Chosen Option : **--**

Q.73 Design bond stress in limit state method for plain bars in tension used in M30 grade concrete as IS 456-2000 shall be:

Ans ✓ 1. 1.5 N/mm^2

✗ 2. 1.9 N/mm^2

✗ 3. 1.2 N/mm^2

✗ 4. 1.7 N/mm^2

Question ID : **630680197392**

Status : **Answered**

Chosen Option : **4**

Q.74 Which of the following conditions is to be satisfied by a transition curve?

Ans ✓ 1.
At the junction of transition and circular curves, the angle between their respective tangents should be zero.

✗ 2.
At the junction of transition and circular curves, the angle between their respective tangents should be 90°.

✗ 3.
Its curvature at its junction with the circular curve should be zero.

✗ 4.
The radius of the transition curve at its junction with the straight is infinity.

Question ID : **630680197342**

Status : **Answered**

Chosen Option : **4**

Q.75 In the plane table survey, the accuracy with which the instrument station can be established in three-point problem is known as:

Ans
  ✗ 1. strength of ranging

  ✗ 2. strength of solution

  ✗ 3. strength of levelling

  ✔ 4. strength of fix

Q.76 Which of the following types of drinking water is obtained by the reclamation process?

Ans
  ✗ 1. Groundwater

  ✗ 2. surface water

  ✗ 3. Infiltrated water

  ✔ 4. Desalinated water

Q.77 Which of the following statements related to laminates of building materials is correct?

1. A wood panel glued under pressure from an odd number (usually 3 to 13) of layers/piles of veneers is known as plywood.

2. The process of producing thin sheets of 0.4 mm to 0.6 mm thickness wood for the manufacture of wood products is known as veneers.

Ans
  ✗ 1. Both statements are false.

  ✗ 2. Statement 1 is true and 2 is false.

  ✔ 3. Both statements are true.

  ✗ 4. Statement 1 is false and 2 is true.

Q.78 The nominal maximum size of coarse aggregate should be as large as possible within the limits specified but in no case greater than:

Ans
  ✗ 1. Three times the maximum thickness of the member

  ✗ 2. two times the maximum thickness of the member

  ✗ 3. one-third of the minimum thickness of the member

  ✔ 4. one-fourth of the minimum thickness of the member

Q.79 A mild steel rod of 4 mm diameter is bent into a circular shape of a 4 m radius. Find the maximum stress induced in the rod. Take Young's Modulus of the rod equal to 200GPa.

Ans ✗ 1. 85 MPa

✗ 2. 120 MPa

✗ 3. 75 MPa

✔ 4. 100 MPa

Q.80 Which of the following statements is valid for the shear strength of a cohesionless soil?

Ans ✗ 1.
The shear strength is directly proportional to the tangent of the angle of shearing resistance.

✗ 2.
The shear strength of soil is independent of the angle of internal friction of soil.

✔ 3.
The shear strength is inversely proportional to the tangent of the angle of shearing resistance.

✗ 4.
The shear strength is proportional to the cosine of the angle of shearing resistance.

Section : **Reasoning**

Q.1 Six women, A, E, K, L, M and P, are sitting around a square table, facing the centre of the table. Four of them are sitting at the corners, while two are sitting at the exact centre of two of the sides. P and M are sitting diagonally opposite to each other. L is exactly between E and M, while E is sitting at one of the corners. A, at a corner, is sitting to the immediate right of K. No woman is sitting between A and M and between P and E. Who is sitting second to the left of A?
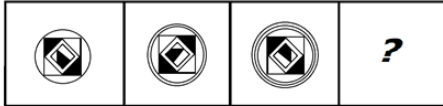
Ans ✔ 1. P

✗ 2. K

✗ 3. L

✗ 4. E

Q.2 In a certain code language, 'APPEAR' is coded as 'PAEPRA' and 'ACTIVE' is coded as 'CAITEV'. How will 'AGENDA' be coded in that language?

Ans

✅ 1. GANEAD

❌ 2. GANAED

❌ 3. ADNEGA

❌ 4. GAENAD

Q.3 Select the figure from among the given options that can replace the question mark (?) in the following series.

Ans

❌ 1.

❌ 2.

✅ 3.

❌ 4.

Q.4 If
'A & B' means 'A is the brother of B's mother',
'A = B' means 'A is the wife of B',
'A % B' means 'A is the husband of B',
'A Ø B' means 'A is the father of B' and
'A * B' means 'A is the mother of B',
then how is T related to P in the following expression?
P = Q Ø R % S * T

Ans ✗ 1. Brother's child

✗ 2. Brother

✔ 3. Son's child

✗ 4. Daughter's husband

Question ID : **630680197413**
Status : **Answered**
Chosen Option : **3**

Q.5 Select the option that is related to the third term in the same way as the second term is related to the first term.
(The words must be considered as meaningful English words and must not be related to each other based on the number of letters/number of consonants/vowels in the word)

SPADE : DIG :: AXE : ?

Ans ✗ 1. GRIND

✗ 2. SOW

✗ 3. GRIP

✔ 4. CHOP

Question ID : **630680197414**
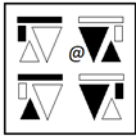Status : **Answered**
Chosen Option : **4**

Q.6 If '+' means 'division', '−' means 'addition', '×' means 'subtraction' and '÷' means 'division', what will be the value of the following expression?

[{(48 × 20) - (2 ÷ 4)} + (2 - 4)] ÷ 2

Ans ✗ 1. 6

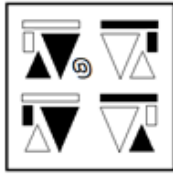✔ 2. 12

✗ 3. 10

✗ 4. 8

Question ID : **630680197418**
Status : **Answered**
Chosen Option : **2**

Q.7 Select the correct mirror image of the given figure when the mirror is placed at the right side.
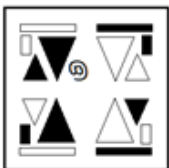

Ans

✔ 1.

✘ 2.

✘ 3.

✘ 4.

Q.8 Select the number from among the given options that can replace the question mark (?) in the following series.

25, 61, 121, 211, 337, ?
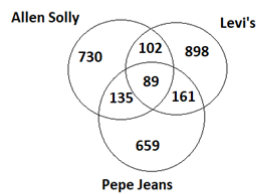
Ans ✔ 1. 505

✘ 2. 508

✘ 3. 500

✘ 4. 506

Q.9 Which two numbers should be interchanged to make the following equation correct?

$15 \times 5 \div 6 + 10 - 2 = 10$

Ans ✔ 1. 2 and 5

✘ 2. 5 and 6

✘ 3. 5 and 15

✘ 4. 2 and 6

Q.10 Study the given diagram carefully and answer the question that follows. The numbers in different sections indicate the numbers of people who buy different brands of clothes.

What is the ratio of the people who buy clothes of either only Allen Solly or only Pepe Jeans brands but not both to the people who buy all three brands?

Ans ✘ 1. 1524 : 89

✔ 2. 1389 : 89

✘ 3. 1721 : 102

✘ 4. 1904 : 102

Section : **Quantitative Aptitude**

Q.1 In an election, a candidate who gets 72% of the votes is elected by a majority of 308 votes. What is the total number of votes polled?

Ans ✘ 1. 740

✔ 2. 700

✘ 3. 720

✘ 4. 750

Q.2 If the average of the numbers 12,25,36,14, 17, 28, 32 and x is 23, then the value of x is:

Ans ✗ 1. 35

✗ 2. 25

✔ 3. 20

✗ 4. 30

Q.3 A person covers a total distance of 420 km on a bike. For the first 5 hours, the speed was 60 km/h and for the rest of the journey, it came down to 40 km/h. What is the average speed of a bike?

Ans ✗ 1. 54.5 km/h

✗ 2. 55.5 km/h

✗ 3. 53.5 km/h

✔ 4. 52.5 km/h

Q.4 The volume of a cylinder with the perimeter of the base 198cm and height 56 cm is:

Ans ✗ 1. 174705 cm^3

✗ 2. 174842 cm^3

✔ 3. 174636 cm^3

✗ 4. 174564 cm^3

Q.5 A train M leaves Amaravati at 5:00 A.M. and reaches Tirupati at 9:00 A.M. Another train N leaves Tirupati at 6:00 A.M. and reaches Amaravati at 8:00 A.M. At what time do the two trains cross each other?

Ans ✗ 1. 7:30 A.M.

✗ 2. 7:15 A.M.

✗ 3. 7:10 A.M.

✔ 4. 7:00 A.M.

Q.6

$$\sqrt{1 + \sqrt{60 + \sqrt{13 + \sqrt{9}}}}\ \text{is equal to:}$$

Ans ✗ 1. 5

   ✗ 2. 6

   ✗ 3. 7

   ✔ 4. 3

Q.7 Two numbers, both greater than 47, have HCF 47 and LCM 2585. The sum of the numbers is:

Ans ✗ 1. 846

   ✗ 2. 564

   ✔ 3. 752

   ✗ 4. 658

Q.8 If 9% of the wall is filled with mortar, then the number of bricks, each measuring 21 cm × 18 cm × 9 cm, required to construct a wall 42 m long, 2 m 70 cm high and 90 cm thick, is:

Ans ✗ 1. 27500

   ✗ 2. 27600

   ✔ 3. 27300

   ✗ 4. 27400

Q.9 By mixing two brands of tea and selling the mixture at the rate of ₹368 per kg, a shopkeeper makes a profit of 15%. If for every 2 kg of one brand costing ₹350 per kg, 3 kg of the other brand is added, then how much per kg does the other brand cost?

Ans ✗ 1. ₹400

   ✔ 2. ₹300

   ✗ 3. ₹375

   ✗ 4. ₹350

Q.10 Two pipes A and B can fill a tank in 27 minutes and 36 minutes, respectively. If both the pipes are opened simultaneously, after how much time should B be closed so that the tank is full in 21 minutes?

Ans
- ✔ 1. 8 minutes
- ✘ 2. 6 minutes
- ✘ 3. 9 minutes
- ✘ 4. 7 minutes

Section : **General Awareness**

Q.1 Which of the following organisations was established in 1884?

Ans
- ✘ 1. Poona Sarvajanik Sabha
- ✔ 2. Madras Mahajan Sabha
- ✘ 3. Bombay Presidency Association
- ✘ 4. Indian National Congress

Q.2 Which of the following mountain peaks is NOT located in the state of Rajasthan?

Ans
- ✘ 1. Guru Shikhar
- ✘ 2. Kumbhalgarh
- ✔ 3. Girnar
- ✘ 4. Dilwara

Q.3 Which of the following statements is INCORRECT about the gene?

Ans
- ✘ 1. Some genes act as instructions to make molecules called proteins.
- ✘ 2. A gene is the basic physical and functional unit of heredity.
- ✔ 3. The SRPF gene provides instructions for making a protein called the CF transmembrane.
- ✘ 4. Genes are made up of DNA.

Q.4 As of July 2022, which of the following states do NOT have a bicameral legislature?

Ans ❌ 1. Uttar Pradesh and Bihar

✅ 2. Rajasthan and Gujarat

❌ 3. Telangana and Andhra Pradesh

❌ 4. Karnataka and Maharashtra

Question ID : **630680197438**
Status : **Answered**
Chosen Option : **3**

Q.5 In 2022, which of the following teams won the 9th Women National Ice Hockey Championship?

Ans ❌ 1. Chandigarh

✅ 2. Ladakh

❌ 3. Madhya Pradesh

❌ 4. Indo-Tibetan Border Police

Question ID : **630680197439**
Status : **Not Answered**
Chosen Option : **--**

Q.6 Who became the first woman and the second Indian to feature on the 'wall of former chief economists' of the International Monetary Fund (IMF)?

Ans ✅ 1. Gita Gopinath

❌ 2. Madhabi Puri Buch

❌ 3. Falguni Nayar

❌ 4. Roshni Nadar Malhotra

Question ID : **630680197430**
Status : **Not Answered**
Chosen Option : **--**

Q.7 According to the Union Budget 2022-2023, in which sector does the Union Government expend the highest money?

Ans ❌ 1. Subsidies

❌ 2. Centrally sponsored schemes

❌ 3. Defence

✅ 4. Interest payments

Question ID : **630680197434**
Status : **Answered**
Chosen Option : **4**

Q.8 Mahabodhi Temple is situated in:

Ans ✔ 1. Bihar

✘ 2. Meghalaya

✘ 3. Manipur

✘ 4. Uttar Pradesh

Question ID : **630680197432**
Status : **Answered**
Chosen Option : **1**

Q.9 In which year was the Sapru Committee established to provide the recommendations on constitutional principles published in its report?

Ans ✘ 1. 1948

✘ 2. 1947

✘ 3. 1952

✔ 4. 1945

Question ID : **630680197437**
Status : **Not Answered**
Chosen Option : **--**

Q.10 The things a firm owns or what a firm can claim from others is/are called:

Ans ✘ 1. required reserves

✔ 2. assets

✘ 3. liabilities

✘ 4. property

Question ID : **630680197433**
Status : **Answered**
Chosen Option : **2**

Section : **English Language**

Q.1 Select the most appropriate synonym of the given word to fill in the blank.

Feasible
It is not _____ to put all the finds from excavations on public display.

Ans ✘ 1. unreasonable

✘ 2. difficult

✘ 3. impossible

✔ 4. practicable

Question ID : **630680197442**
Status : **Answered**
Chosen Option : **4**

Q.2 Parts of the following sentence have been given as options. Select the option that contains an error in spelling. If you don't find any error, mark 'No error' as your answer.

When an earthquacke occurs, shock waves radiate from its epicentre.

Ans   ✖ 1. from its epicentre

     ✔ 2. When an earthquacke occurs

     ✖ 3. No error

     ✖ 4. shock waves radiate

Question ID : **630680197443**
Status : **Answered**
Chosen Option : **2**

Q.3 Select the most appropriate meaning of the given idiom.

By hook or by crook

Ans   ✔ 1. By any means

     ✖ 2. On the whole

     ✖ 3. By virtue of

     ✖ 4. In all directions

Question ID : **630680197445**
Status : **Answered**
Chosen Option : **1**

Q.4 Select the most appropriate option to fill in the blank.

What a lovely smell! Mother _____ a cake.

Ans   ✔ 1. is baking

     ✖ 2. had baked

     ✖ 3. will bake

     ✖ 4. bakes

Question ID : **630680197441**
Status : **Answered**
Chosen Option : **2**

Q.5 Select the most appropriate meaning of the given idiom.

Blow out

Ans   ✖ 1. To pass without causing any harm

     ✔ 2. To extinguish (a flame) by an air current

     ✖ 3. To enter a building by force

     ✖ 4. To destroy by an explosion

Question ID : **630680197444**
Status : **Answered**
Chosen Option : **2**

Q.6 Sentences of a paragraph are given below in jumbled order. Arrange the sentences in the correct order to form a meaningful and coherent paragraph.

A. Then the inevitable happened.
B. After a few years he went to England and I lost touch with him.
C. Anik and I had been very close friends in school.
D. He went on to study science and I took up arts.

Ans ✘ 1. BDCA

✘ 2. ACDB

✔ 3. CADB

✘ 4. CBAD

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

They sent us photographs _____ their baby.

Ans ✘ 1. on

✔ 2. of

✘ 3. to

✘ 4. for

Comprehension:

Read the given passage and answer the questions that follow.

Under the supremacy of the British in India, the economic condition of the rural India was much affected. The peasants were ruthlessly crushed and they were forced to cultivate indigo in their lands instead of food crops. The peasants continuously crushed, gradually organised a revolt against their oppression. However the Indigo Cultivators Revolt was primarily directed against the British planters who behaved like the feudal lords in their estates. The revolt enjoyed the supports of all categories of rural population, the zamindars, moneylenders, rich peasants and even the karmacharis of indigo concerns. Right from the beginning of the 19th century many retired officials of the East India Company and some slave traders of England owned several lands from the Indian zamindars in Bihar and Bengal. In these lands they began a large-scale cultivation of indigo. First of all the price was too low in India. Hence the Indigo planters could make enormous profits by cultivating indigo in India.

The indigo planters committed great cruelty and oppressions on the indigo cultivators in the process of forcing them to grow indigo crops under terms, which were least preferable to them. In April 1860, all the cultivators of Barasat subdivision and in the districts of Patna and Nadia resorted to strike to articulate their demands. This strike was the first general strike in the history of Indian Peasantry. The peasants collectively refused to cultivate and to sow the seeds of indigo. The strike gradually spread to Jessore, Khulna, Rajshahi, Dacca, Malda, and Dinajpur and in the extensive regions of Bengal.

SubQuestion No : 8

Q.8 **The passage is mainly about:**

Ans ✗ 1. British atrocities on rural India

✗ 2. profits made by Indigo planters

✗ 3. slave traders of England

✔ 4. revolt by Indigo cultivators

Question ID : **630680197448**
Status : **Answered**
Chosen Option : **4**

Comprehension:

Read the given passage and answer the questions that follow.

Under the supremacy of the British in India, the economic condition of the rural India was much affected. The peasants were ruthlessly crushed and they were forced to cultivate indigo in their lands instead of food crops. The peasants continuously crushed, gradually organised a revolt against their oppression. However the Indigo Cultivators Revolt was primarily directed against the British planters who behaved like the feudal lords in their estates. The revolt enjoyed the supports of all categories of rural population, the zamindars, moneylenders, rich peasants and even the karmacharis of indigo concerns. Right from the beginning of the 19th century many retired officials of the East India Company and some slave traders of England owned several lands from the Indian zamindars in Bihar and Bengal. In these lands they began a large-scale cultivation of indigo. First of all the price was too low in India. Hence the Indigo planters could make enormous profits by cultivating indigo in India.
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SubQuestion No : 9

Q.9 The expression 'resorted to strike' means:

Ans ✗ 1. spread the strike

✔ 2. made use of strike

✗ 3. abandoned the strike

✗ 4. abstained from strike

Comprehension:

Read the given passage and answer the questions that follow.

Under the supremacy of the British in India, the economic condition of the rural India was much affected. The peasants were ruthlessly crushed and they were forced to cultivate indigo in their lands instead of food crops. The peasants continuously crushed, gradually organised a revolt against their oppression. However the Indigo Cultivators Revolt was primarily directed against the British planters who behaved like the feudal lords in their estates. The revolt enjoyed the supports of all categories of rural population, the zamindars, moneylenders, rich peasants and even the karmacharis of indigo concerns. Right from the beginning of the 19th century many retired officials of the East India Company and some slave traders of England owned several lands from the Indian zamindars in Bihar and Bengal. In these lands they began a large-scale cultivation of indigo. First of all the price was too low in India. Hence the Indigo planters could make enormous profits by cultivating indigo in India.

The indigo planters committed great cruelty and oppressions on the indigo cultivators in the process of forcing them to grow indigo crops under terms, which were least preferable to them. In April 1860, all the cultivators of Barasat subdivision and in the districts of Patna and Nadia resorted to strike to articulate their demands. This strike was the first general strike in the history of Indian Peasantry. The peasants collectively refused to cultivate and to sow the seeds of indigo. The strike gradually spread to Jessore, Khulna, Rajshahi, Dacca, Malda, and Dinajpur and in the extensive regions of Bengal.

SubQuestion No : 10

Q.10 Which of the following did NOT support the indigo cultivators' revolt?

Ans ✘ 1. Money lenders

✘ 2. Karmacharis of indigo concerns

✘ 3. Zamindars

✔ 4. Officials of East India Company