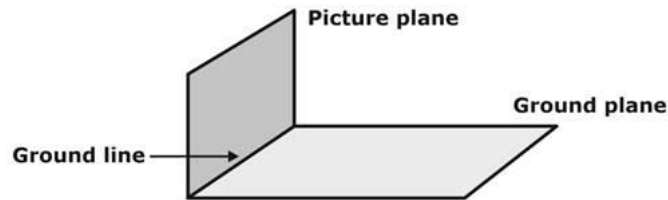gradeup

PPSC JE

Civil Engineering

Mini Mock Challenge
(May 4th - May 5th 2021)

Questions & Solutions

1.   In perspective view, the intersection of ground plane and picture plane is called

    A. Horizon   B. Ground line

    C. Vanishing point   D. Station point

Ans. B

Sol.

2.   Three forces are in equilibrium when:

    A. Force triangle closes

    B. The lines of action of three forces are concurrent

    C. Both A and B

    D. None of these

Ans. A

Sol. The lines of action of three forces acting at a point may or may not be in equilibrium, but if force triangle closes then forces are in equilibrium.

3.   Which of the following statement is correct for the stream line?

    A. Stream line are non-orthogonal to each other

    B. All flow field are elementary curvilinear

    C. It is used to determine flow patten for solid boundary on downstream side

    D. All of the above

Ans. B

Sol. ● Stream line are orthogonal to each other

    ● All flow field are elementary curvilinear

    ● It is not used to determine flow Patten for solid boundary on downstream side

4.   Which of the following parameter exist in irrotational

    A. Vorticity   B. Velocity potential

    C. Streak function   D. All of the above

Ans. D

Sol. Vorticity and stream function parameters exist in both rotational and irrotational flow, where, velocity potential function exists only for ideal flow and irrotational flow.

5. Break horse power of the centrifugal pump is

A. $\dfrac{PQH}{745}$

B. $\dfrac{PQH}{n}$

C. $\dfrac{PQH}{75n}$

D. $\dfrac{PQH}{736}$

Ans. C

Sol. Break horse power $= \dfrac{PQH}{75n}$

P = density

Q = Discharge

H = Head

n = Efficiency

6. Which of the flowing having least RPM (revolutions per minute)

A. centrifugal pump

B. Rotary pump

C. Axial flow pump

D. Reciprocating pump

Ans. D

Sol. Reciprocating pump has least RPM (revolutions per minute)

7. If specific gravity of any fluid decrease, then its equipment head compare to water

A. increase

B. decrease

C. constant

D. First increase then decrease

Ans. A

Sol. Equivalent head of any liquid $[4] = \dfrac{\text{head of water}}{\text{SG of liquid}\,[4]}$

8. To generate 400 kilowatt power under the head of 81m while working at a speed of 400 RPM ; specific speed of turbine will be

A. 33.43

B. 299

C. 46

D. 98.76

Ans. A

Sol. $N_s = \dfrac{N\sqrt{P}}{H^{5/4}} = \dfrac{400\sqrt{400}}{81^{5/4}} = 33.43$

9. Which turbine operates under low head and high discharge ?

A. Pelton turbine

B. Kaplan turbine

C. Banki turbine

D. Francis turbine

Ans. B

Sol. Kaplan turbine run at specific speed of 600-1000.

10. A hemispherical parachute is designed so that it can carry weight of 5 kN. When it drops through air (ρ = 2 Kg/m3) and to reach ground with velocity less than 8 m/seC. Assume C_d= 3/2. What should the value of parachute diameter when opened

    A. 7.5 m   B. 6.2 m

    C. 8.2 m   D. 4.5 m

Ans. C

Sol. Buoyancy and drag force will balance the weight

$$\frac{C_D \cdot \rho \cdot A \cdot v^2}{2} = w$$

(3/2) x 2 x ($\frac{\Pi}{4}$) x d^2 x 8^2 x (1/2) = 5000

d = 8.14 ≈ 8.2 m

11. Consider the following observation about the boundary layer growth for a real fluid flow along a long and thin flat plate

    A. Thickness of boundary layer decreases along the direction of flow

    B. Boundary shear stress decreases along the direction of flow

    C. Space beyond boundary layer has variable velocity and zero shear stress

    D. flow within boundary layer is laminar near the plate surface and turbulent away from it

Ans. B

Sol. The boundary shear stress is inversely proportional to Reynolds number Re and it decreases along the direction of flow.

12. Flow at constant rate through a tapering pipe is _____.

    A. steady and uniform flow   B. steady and non-uniform flow

    C. unsteady and uniform flow   D. unsteady and non-uniform flow

Ans. B

Sol. Velocity changes with respect to space so steady and non-uniform flow.

At a given point, the velocity is constant so the flow is steady. Between two different point, the velocity is changing, so the flow is non-uniform.

13. Which of the following is the unit of kinematic viscosity _____.

    A. pascal   B. poise

    C. stoke   D. faraday

Ans. C

Sol. The kinematic viscosity [m^2/s] is the ratio between the dynamic viscosity [Pa.s = 1 kg/m ·s] and the density of a fluid [kg/m^3]. The SI unit of the kinematic viscosity is m^2/s. Other units are: 1 St (Stoke) = 1 cm^2/s = 10^{-4} m^2/s.

14. Which of the following is CORRECT about the viscosity of gas?

    A. Inversely proportional to the temperature

    B. Increases with an increase in the temperature

    C. Independent of pressure

    D. Independent of temperature

Ans. B

Sol. Viscosity of gas is directly proportional to the temperature.

   If temperature increases the movement of particles increases and hence viscosity will be increased.

15. According to Dicken's formula, the flood discharge Q in cumecs is given by

    A. $CA^{2/3}$ B. $CA^{3/4}$

    C. $CA^{5/6}$ D. $CA^{7/8}$

Ans. B

Sol. The flood discharge Q in cumecs is given by $CA^{3/4}$

   Where C = Dicken's coefficient

   A = Area of the basin in sq. km.

16. Viscous force is the _____ of shear stress due to viscosity and cross sectional area of flow.

    A. Sum   B. Product

    C. Difference   D. Ratio

Ans. B

Sol. Viscous force = shear stress *cross sectional area of flow.

17. Angles of 45 ° with a chain line may be set out with:

    A. Optical square   B. French square

    C. Open cross staff   D. Prismatic square

Ans. B

Sol. Angles of 45 ° with a chain line may be set out with French square. And with optical square 90 minutes.

18. In plane surveying:

    A. The curvature of the earth is taken into consideration

    B. The curvature of the earth is not taken into consideration

    C. The degree of accuracy of surveys is high

    D. The surveys extend over large areas

Ans. B

Sol. In plane surveying the curvature of the earth is not taken into consideration. While in geodetic surveying curvature of earth surface is considered.

19. If the spacing of cross-hairs in a stadia diaphragm of tacheometer is 13 mm, and the focal length of the object glass is 26 cm, then the multiplying constant of the tacheometer is

A. 20
B. 100
C. 0.005
D. 200

Ans. A

Sol. Multiplying constant $= \frac{f}{i} = \frac{260}{13} = 20$ (26 cm = 260 mm)

20. For contouring rough countries where ordinary leveling is tedious and chaining is slow and inaccurate, the method employed is:

A. Leveling
B. Plane table surveying
C. Tacheometric surveying
D. Compass surveying

Ans. C

Sol. Tacheometric method is most suitable in hilly areas as the number of stations which can be commanded by a tacheometer is far more than those by a level and thus the number of instrument-settings is considerably reduced. And the tacheometer is used for both the vertical as well as for the horizontal measurements.

21. A line of 5cm has shrunk to 4.0 cm. The correct length corresponding to the measured length of 80m is _____ m.

A. 100
B. 101
C. 99
D. 60

Ans. A

Sol.

$$\text{Shrinkage factor} = \frac{\text{shrunk length}}{\text{original length}} = \frac{4.0}{5} = 0.8$$

$$\text{Correct length} = \frac{\text{Measured length}}{\text{Shrinkage factor}} = \frac{80}{0.8} = 100 \text{ m}$$

22. The closeness of a measurement to its true value is called as:

A. Precision
B. Accuracy
C. Correctness
D. Approximation

Ans. B

Sol. Accuracy denotes the closeness of a measurement to its true value. If the measured value is very close to its true value, it is very accurate.

Precision of a measurement denotes its closeness to another measurement of the same quantity.

23. The method of ranging adopted when the terminal stations are not intervisible and when there is no intermediate point from which the terminal stations are intervisible is _____.

A. Direct ranging
B. Reciprocal ranging
C. Indirect ranging
D. Random line method.

Ans. D

Sol. The random line method is adopted when obstructions such as forest hinder the intervisibility of terminal stations and also no intermediate point is available from which the terminal stations are intervisible.
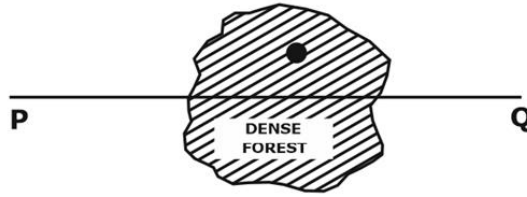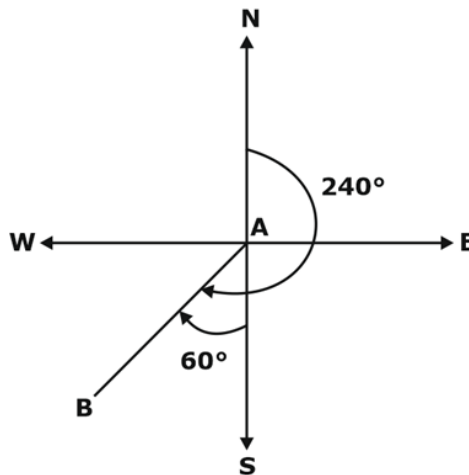

24. The whole circle bearing of a line AB is 240°. Its reduced bearing is _____.

    A. N30°W   B. S60°W

    C. N60°E   D. S30°E

Ans. B

Sol. 240°=180°+60°

    From figure, The reduced bearing is S60°W

25. The reduced bearing of a line is N 87 W, Its whole circle bearing is:

    A. 87 °   B. 173 °

    C. 273 °   D. 183 °

Ans. C

Sol.
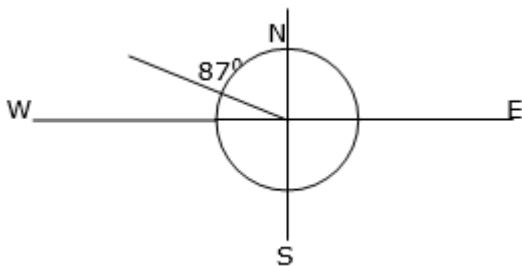
    The whole circular bearing will be 360 − 87 = 273.

26. Which of the following is the correct percentage of maximum moisture content based in sand where change in volume is maximum?

A. 5%

B. 9%

C. 12%

D. 15 %

Ans. A

Sol. Change in volume is maximum at 5% moisture content.

27. Which of the following constituents is present in the blast furnace slag?

A. 50% alumina and 20% calcium oxide

B. 45% calcium oxide and 35% silica

C. 25% calcium oxide and 15% silica

D. 25% magnesia and 15% silica

Ans. B

Sol. Ranges of chemical compositions of blast furnace slag are 32 – 43% SiO_2 (silica), 7 – 16% Al_2O_3 (alumina), 32 – 45% CaO (calcium oxide), and 5 – 15% MgO (magnesium oxide). It is the glassy material formed by water quenching of molten slag discharged from the blast furnaces in the iron making industry.

28. The main constituents of fly ash are:

A. Silica

B. Aluminium oxide

C. Ferrous oxide

D. All of the above

Ans. D

Sol. Silica, aluminium oxide, Ferrous oxide all are major constituents of fly ash.

29. Gypsum used in cement manufacturing acts as

A. accelerator

B. air entraining agent

C. plasticizer

D. retarder

Ans. D

Sol. gypsum is called the retarding agent of cement which is mainly used for regulating the setting time of cement & is an indispensable component.

Without gypsum, cement clinker can condense immediately by mixing with water & release heat. It generate a calcium aluminate hydrate, (a clotting agent) which will destroy the normal use of cement.

30. The initial setting time of Ordinary Portland Cement (OPC) is

A. 10 min.

B. 30 min.

C. 45 min.

D. 60 min.

Ans. B

Sol. The time at which cement paste loses its plasticity is called initial setting time. The initial setting time for different types of cements is as follows: For OPC (Ordinary Portland Cement) 33 Grade as per IS 269:1989 is **30 minutes**.

31. Too wet concrete may cause _____.

    A. Segregation   B. Lower density

    C. Weakness of concrete   D. All options are correct

Ans. D

Sol. Too wet concrete leads to segregation.

    Segregation = separation of coarse aggregate from cement.

    Also if cement or aggregates losses, overall density decreases and strength also reduces

32. The initial setting time for Ordinary Portland cement as per IS specifications should not be

    less than:

    A. 10 minutes   B. 30 minutes

    C. 60 minutes   D. 600 minutes

Ans. B

Sol. As per IS specifications, Initial settling time should not be less than 30 minutes for OPC

    and 60 minutes for low heat cement.

    Initial settling time is the time elapsed between the moment that the water is added to

    the cement, to the time that the paste starts losing its plasticity

33. Which of the following shows the CORRECT expression for target mean strength (f_{cm}) of

    concrete, if the characteristic strength and standard deviation is given by f_{ck} and σ

    respectively?

    A. $f_{cm} = f_{ck} + 1.65\sigma$ B. $f_{cm} = f_{ck} - 1.65\sigma$

    C. $f_{cm} = f_{ck} - \sigma/1.65$ D. $f_{cm} = f_{ck} + 1.5\sigma$

Ans. A

Sol. According to IS 10262,

    The target mean strength of the concrete mixture,

    Target mean strength, $f_m = f_{ck} + 1.65\sigma$

    Where σ is the standard deviation and initially based on prior experience and later

    determined from trial results.

34. Which of the below is not property of ferro cement?

    A. Impervious nature   B. Capacity to resist shock

    C. No need of formwork   D. Strength per unit mass is low

Ans. D

Sol. The ferro cement has reinforcement provided in mortar. It has a strength per unit mass

    higher than R.C.C. It has better tension resisting property.

35. Which of the following material is not used in making trusses?

    A. Wooden struts   B. Metal bars

    C. Channel   D. Concrete

Ans. D

Sol. Trusses are made up of steels or woods.

The material used in making truss

1. metal bars

2. channel

3. wooden struts

4. purlins etc.

36. Hollow bricks are generally used with the purpose of _____.

A. reducing the cost of construction   B. providing insulation against heat

C. increasing the bearing area   D. ornamental look

Ans. B

Sol. The air present in the hollow area of these bricks make them **thermal** insulators. They keep the interiors cool in summer and warm in winter especially the 'clay hollow bricks'. They also provide more sound insulation as compared to solid bricks.

37. The standard size of brick as per Indian standards is _____.

A. 20 cm x 10 cm x 10 cm   B. 23 cm x 12 cm x 8 cm

C. 19 cm x 9 cm x 9 cm   D. 18 cm x 9 cm x 9 cm

Ans. C

Sol. The standard or modular size of brick

19 cm x 9 cm x 9 cm

Nominal size= 20cm x 10cm x10cm

Conventional size=25cm x 15 cm x 7.5cm

38. Total number of Condition for static equilibrium are

A. 2   B. 3

C. 4   D. 1

Ans. B

Sol. The necessary internal forces to keep the segment of the beam in equilibrium are

$$\sum F_x = 0 \Rightarrow P$$
$$\sum F_y = 0 \Rightarrow V$$
$$\sum F_z = 0 \Rightarrow M$$

39. Distortion energy theory for the failure of a material at the elastic limit is called

A. Rankine theory

B. St. Venant theory

C. Guests or Trescas theory

D. Huber Henky Von Mises theory

Ans. D

Sol. Rankine theory – max principle stress

St. Venant theory – max principle strain

Guests or Trescas theory- max strain energy theory

Huber Henky Von Mises theory - Distortion energy theory

40. Reaction forces generate in a supports depend upon

A. Type of loading   B. Dimension of beam

C. Type of support   D. A & C

Ans. D

Sol. * Reaction forces generate in a supports depend upon type of loading. Example If a beam is subject to vertical load only then no horizontal reaction will generated

* Reaction forces generate in a supports depend upon type of support. Example: If a beam is simple supported and one end and fixed supported on other end. Beam is subjected to horizontal loading then horizontal support reaction will generate on fixed end only.

41. St 1: Equation of static equilibrium alone are enough to determine supports reaction of statically determinate beam

St 2: St 1: Equation of static equilibrium alone are enough to determine supports reaction of Statically indeterminate beam

A. St1 is true and St2 is false   B. St1 is False and St2 is True

C. Both are true   D. Both are false

Ans. A

Sol. * Equation of static equilibrium alone are enough to determine supports reaction of statically determinate beam because number of knowns are not more than static equilibrium condition

* In static indeterminate beam number are unknowns are more than static equilibrium conditions hence additional equations are required to find the solution.

42. Calculate the reaction forces due to the loading shown in the figure below.
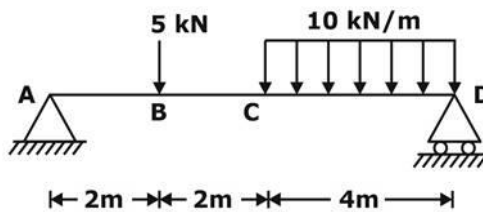
A. R_A =13.75 KN , R_D = 31.25 KN

B. H_A =0 KN , R_A = 13.75 KN , R_D = 31.25 KN

C. H_A =0 KN, R_A =31.25 KN , R_D = 13.75 KN

D. H_A =0 KN , R_A =6.25 KN , R_D = 38.75 KN

Ans. B

Sol. Let R_A , H_A are reaction forces at A. R_D is reaction force at D then

Since no horizontal force is acting on a beam so H_A =0 KN

By equation $\Sigma F_y = 0$, we get

$R_A + R_D = 45$

$Taking \sum M_A = 0 \quad R_C \times 2 - P_A + 4 \times 1 = 0$

R_D = 31.25 KN

R_A = 13.75 KN

Note: Option A is incorrect because it didn't mention about horizontal force while B mentioned about it so option B is most appropriate answer. If there was no mention of horizontal force in all four options then Both A and B was corrected

43. Find reaction forces R_A and H_B of a beam given below if total length of beam is 9 meter (Assume w= 25 KN)
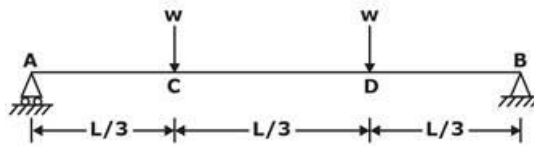
A. R_A =25 KN and H_B =0 KN

B. R_A = 25 KN and H_B = 25 KN

C. R_A =0 KN and H_B =0 KN

D. R_A and H_B can not be found

Ans. A

Sol. By equation $\Sigma F_y = 0$, we get

$R_A + R_B = 2W$

$R_A \times L - W \times \dfrac{2L}{3} - \dfrac{WL}{3} = 0$

$\Rightarrow R_A L = \dfrac{2WL}{3} + \dfrac{WL}{3} = WL$

$\Rightarrow R_A$ = 25 KN

$\Rightarrow R_B$ = 25 KN

Since no horizontal force is acting on a beam so H_B =0 KN

44. Calculate the Poisson ratio of a material whose modulus of elasticity and bulk modulus is 1.45×10^5 MPa and 2.175×10^5 MPa respectively.

A. 0.17

B. 0.25

C. 0.28

D. 0.39

Ans. D

Sol. Given,

Modulus of Elasticity (E) = 1.45 × 10^5 MPa

Bulk Modulus (K) = 2.175 ×10^5 MPa

Relation between E, K and n is

$$K = \frac{E}{3(1 - 2\mu)}$$

$$2.175 \times 10^5 = \frac{1.45 \times 10^5}{3 \times (1 - 2\mu)}$$

Which gives, μ = 0.39

45. A beam of triangular cross section carries a shear force F. Then shear stress is max at

   A. Bottom most fiber   B. Top most fiber

   C. At neutral axis   D. Mid depth of the section

Ans. D

Sol. Shear stress of a triangular section is max at mid depth

46. What is the ratio of strain energy stored in the material due to sudden loading to the strain energy stored in the material due to gradual loading?

   A. 4   B. 2

   C. 0.5   D. 0.25

Ans. A

Sol. The expression for strain energy is given by,

$$U = \frac{\sigma^2}{2E} V$$

Due to suddenly applied load, the stress in the bar is twice that of the stress due to gradually applied load.

Thus, strain energy due to sudden loading would be 4 times that of strain energy due to gradually applied load.

47. The rotation at the support of a simply supported beam of length 5 m due to a point load of 50 kN at the centre is Flexural rigidity of beam is 2×10^{11} N-mm^2

   A. 0.039 rad   B. 0.39 rad

   C. 0.089 rad   D. 0.89 rad

Ans. B

Sol. Rotation at the support due to point load at centre is given by

$$\theta = \frac{WL^2}{16EI}$$

Given,

W =50 kN = 50000 N

L = 5m = 5000 mm

EI $= 2 \times 10^{11}$ N-mm^2

So,

$$\theta = \frac{50000 \times 5000^2}{16 \times 2 \times 10^{11}} = 0.3906 \text{ rad}$$

48. The design criteria as per maximum shear strain energy theory is

(All symbols have their usual meaning)

A. $\sigma_1^2 + \sigma_2^2 - \sigma_1\sigma_2 \geq f^2$ 　　　　　　B. $\sigma_1^2 + \sigma_2^2 + \sigma_1\sigma_2 \geq f^2$

C. $\sigma_1^2 + \sigma_2^2 - \sigma_1\sigma_2 \geq f$ 　　　　　　D. $\sigma_1^2 + \sigma_2^2 + \sigma_1\sigma_2 \geq f$

Ans. A

Sol. If σ_1 and σ_2 are principal stresses acting on a body, then as per maximum shear strain energy theorem,

$$\sigma_1^2 + \sigma_2^2 - \sigma_1\sigma_2 \geq f^2$$

49. In a two-dimensional stress system, the stresses are acting such that the radius of mohr circle is 29.38 MPa. The difference of major and minor principal stress is

A. 14.69 MPa 　　　　　　　　　　B. 29.38 MPa

C. 58.76 MPa 　　　　　　　　　　D. 117.52 MPa

Ans. C

Sol. Stresses on major/minor principal plane is given by:

$$\sigma_1 / \sigma_2 = \frac{p_1 + p_2}{2} \pm \sqrt{\left(\frac{p_1 - p_2}{2}\right)^2 + q^2}$$

Where,

P_1, P_2 and q are normal and shear stresses acting on the section.

Radius of mohr circle is $\sqrt{\left(\frac{p_1 - p_2}{2}\right)^2 + q^2}$

Thus, difference of major and minor principal stress

$$\sigma_1 - \sigma_2 = 2\sqrt{\left(\frac{p_1 - p_2}{2}\right)^2 + q^2} = 2 \times 29.38 = 58.76 \text{ MPa}$$

50. The ratio of maximum bending stress in the two sections subjected to same bending moment having the following dimension

Section 1 = 200×600 mm

Section 2 = 400×600 mm

A. 0.25 　　　　　　　　　　　　　B. 1

C. 2 　　　　　　　　　　　　　　　D. 4

Ans. C

Sol. As per bending theory,

$$\frac{M}{I} = \frac{\sigma}{y} = \frac{E}{R}$$

Thus,

$$\sigma = \frac{M}{I} \times y$$

Thus,

For the same bending moment and depth

$$\frac{\sigma_1}{\sigma_2} = \frac{I_2}{I_1}$$

Moment of inertia of a rectangular beam = $\dfrac{bd^3}{12}$

Thus,

$$\frac{\sigma_1}{\sigma_2} = \frac{b_2}{b_1} = \frac{400}{200} = 2$$

51. The power transmitted by a circular shaft subjected to a torque of 6 kNm and rotating at a speed of 200 rpm is

   A. 96 .45 kW
   B. 114.35 kW
   C. 125.67 kW
   D. 138.65 kW

Ans. C

Sol. Torque (T) = 6 kNm

   N = 200 rpm

   Power transmitted by shaft $P = \dfrac{2\pi NT}{60} = \dfrac{2 \times \pi \times 200 \times 6}{60} = 125.67$ kW

52. The unit of flexural rigidity is

   A. N – mm
   B. N/mm
   C. N – mm²
   D. N/mm²

Ans. C

Sol. Flexural rigidity is defined as EI

   Where, E is young's modulus of elasticity, unit $\rightarrow$ N/mm²

   I = Moment of Inertia, unit $\rightarrow$ mm²

   So, the unit of EI is N – mm².

53. A rectangular section of width 250 mm and height 400 mm is subjected to a shear force of 45 kN. The magnitude of maximum shear stress develops in the section would be

   A. 0.45 N/mm²
   B. 0.67 N/mm²
   C. 0.78 N/mm²
   D. 0.86 N/mm²

Ans. B

Sol. Width of section (B) = 250 mm

Depth of section (D) = 400 mm

Shear force (V) = 45 kN

Maximum shear stress $\tau_{max} = \dfrac{3}{2}\dfrac{V}{BD} = \dfrac{3}{2} \times \dfrac{45 \times 1000}{250 \times 400} = 0.675$ N/mm^2

54. If the characteristic strength is defined as the value of strength of material below which not more than 50% of test results are expected to fall, then the characteristic strength will be equal to (f_m: mean strength, σ: standard deviation)

A. $f_m - 1.645\sigma$

B. $f_m + 1.645\sigma$

C. f_m

D. $f_m - 0.825\sigma$

Ans. C

Sol. For strength of material below which not more than 50% results are expected to fall f_{ck} = f_m.
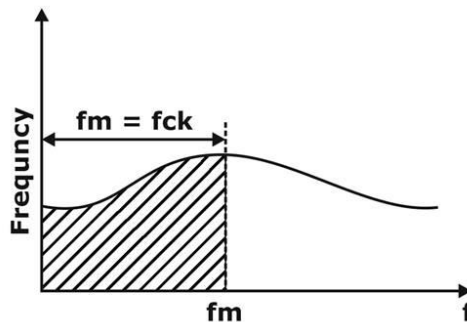
55. The centre to centre spacing of vertical stirrups, in a rectangular beam, is:

A. Increased towards the centre of the span of the beam

B. Decreased towards the centre of the span of the beam

C. Increased at the ends

D. None of these

Ans. A

Sol. The centre to centre spacing of vertical stirrups, in a rectangular beam, is Increased towards the centre of the span of the beam.

56. The minimum cover for bars in RCC slabs should be:

A. 15 mm

B. 15 mm or dia of bars

C. 25 mm or dia of bars

D. 15 mm or the size of the aggregate

Ans. B

Sol. The minimum cover for bars in RCC slabs should be 15 mm or dia of bars.

57. A reinforced concrete beam is cast during a summer month when the ambient temperature is around 42 °C. During the winter when the ambient temperature is around 5 °C, the stress in the concrete will be:

    A. Compressive

    B. Compressive as well as tensile as in flexure

    C. Tensile

    D. The same as at the time of casting

Ans. C

Sol. A reinforced concrete beam is cast during a summer month when the ambient temperature is around 42 °C. During the winter when the ambient temperature is around 5 °C, the stress in the concrete will be tensile in nature.

58. An RCC column of circular cross-section and length L runs along two stories. The ends of the column is restrained in position and direction. The effective length of the column is

    A. L   B. 0.8 L

    C. 0.65 L   D. 2 L

Ans. C

Sol. For a column that is effectively held in position and restrained against rotation at both ends the effective length recommended is 0.65L.

    For columns effectively held in position at both ends but restrained against rotation only at one end, the effective length recommended is 0.8L.

    For columns held in position at both ends but not retrained against rotation at both ends, the recommended value for effective length is L.

    For columns that are effectively held in position and restrained against rotation only at one end and the other end remaining free, the effective length recommended is 2L.

59. A singly reinforced rectangular concrete beam of width 300 mm and effective depth 400 mm is to be designed using M25 grade concrete and Fe500 steel. The limiting depth of neutral axis of the beam is:

    A. 400 mm   B. 212 mm

    C. 192 mm   D. 184 mm

Ans. D

Sol. Limiting depth of neutral axis depends on the grade of steel only.

    For Fe 250, $X_{umax} = 0.53\ d$

    For Fe 415 $X_{umax} = 0.48\ d$

    For Fe 500 $X_{umax} = 0.46\ d$

    Here the grade of steel used is Fe500. Therefore, $x_{umax} = 0.46\ d = 0.46 \times 400 = 184$ mm.

60. Maximum total acid soluble chloride content for reinforced concrete or plain concrete containing embedded metal is

A. 0.4 kg/m^3 B. 0.6 kg/m^3

C. 0.8 kg/m^3 D. 3 kg/m^3

Ans. B

Sol. Limits of Chloride Content of Concrete

Type or use of concrete	Maximum total acid soluble chloride content expressed as kg/m^3 of concrete
Concrete containing metal and steam cured at elevated temperature and pre-stressed concrete	0.4
Reinforced concrete or plain concrete containing embedded metal	0.6
Concrete not containing embedded metal or any material requiring protection from chloride	3.0

61. A plastic hinge is a zone of yielding due to:

A. tension   B. shear

C. flexure   D. All of the above

Ans. C

Sol. Plastic hinge is a yielded zone due to flexure in a structure in which infinite rotation can take place at a constant restraining moment of the section.

62. The value of maximum effective slenderness ratio for a steel member carrying compressive loads resulting from dead loads and live loads is

A. 200   B. 180

C. 150   D. 300

Ans. B

Sol. the value of slenderness ratio for a beam, strut or tension member carrying compressive loads resulting from dead loads and live loads shall not exceed 180.

63. Rolled steel T-sections are used _____.

A. as columns

B. with flat strips to connect plates in steel rectangular tanks

C. as built up sections to resist axial tension

D. None of these

Ans. B

Sol. Rolled steel T-sections are used with flat strips to connect plates in steel rectangular tanks. Flanges in T-beam increases the moment carrying capacity of tank.

64. If the unsupported length of a stanchion is 4 meters and least radius of gyration of its cross-section is 5 cm, the slenderness ratio of the stanchion is

   A. 60   B. 70
   C. 80   D. 90

Ans. C

Sol. $Slenderness\ ratio = \dfrac{l}{r}$

$= \dfrac{400}{5} = 80$

65. Find the Fundamental period of vibration for a building shown below
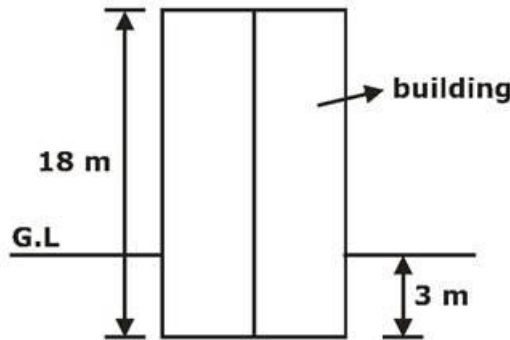
   A. 0.171 sec   B. 0.572 sec
   C. 0.655 sec   D. 0.075 sec

Ans. B

Sol. If H is height of building above ground level then

   H = 18−3 = 15 m

   Fundamental period of vibration (T)

   T = 0.075 H$^{0.75}$

   = 0.572 sec

66. A compound that imparts temporary hardness to water:

   A. Calcium sulphate   B. Magnesium chloride
   C. Calcium nitrate   D. Magnesium carbonate

Ans. D

Sol. Carbonates and bicarbonates of calcium and magnesium cause carbonate hardness. It is also called temporary hardness because this hardness can be removed by simple boiling of water. Sulphates, chlorides and nitrate of calcium and magnesium cause permanent hardness.

67. The water which is not chemically pure but does not contain anything harmful to human health is called as

   A. Pure water   B. Distilled water
   C. Drinking water   D. Wholesome water

Ans. D

Sol. Pure water, distilled water and drinking water all are chemically pure whereas wholesome water is the water which in itself does not contain any harmful particles but has not been chemically processed to remove impurities.

68. Design period for slow sand filters as suggested by CPHEEO is

A. 50 years
B. 30 years
C. 25 years
D. 10 years

Ans. D

Sol. Design period for slow sand filter is taken as 10 years.

69. The minimum diameter for public sewer is hilly areas where steep slopes are prevalent is

A. 300
B. 150
C. 100
D. 50

Ans. C

Sol. Minimum diameter for given condition is 100 mm.

70. A method of disinfection of drinking water:

A. Treatment with excess lime
B. Treatment with ozone
C. Electra-Katadyn process
D. All the above

Ans. D

Sol. * Addition of lime produces chlorine in water which acts ad disinfectant since chlorine is an oxidizing agent.

* Ozone is also used as a disinfectant since it oxidizes with the help of nascent oxygen.

* Electra-Katadyn process is also a disinfection process.

71. Which of the following in incorrect regarding a slow sand filter:

A. Incoming water should not be treated by coagulants
B. Depth of water should double the depth of filter sand
C. Loss of head is limited to a maximum of 1.2 m
D. Cleaning should not be done by back washing

Ans. B

Sol. Depth of sand for slow sand filter is 90-100 cm = 1 m, Depth of water over sand medium would be approximately the same as the depth of sand medium i.e. around 1 m.

72. 'Mathemoglobinemia' disease to children is caused due to excess presence of

A. Nitrates
B. Nitrites
C. Free ammonia
D. Albuminoid nitrogen

Ans. A

Sol. Nitrates are fully oxidized nitrogen compounds. They don't possess any threat in adults but if present in concentration more than 45 mg/l cause a disease called methamoglobinemia in small children. Due to this disease, the color of baby changes to blue and hence it is also known as blue baby diseases.

73. What is the size of the Fine screen used in pretreatment of water?

A. 5 mm

B. 25mm

C. 15mm

D. 20 mm

Ans. A

Sol. fine screens are used in the form of bars of 5mm diameter size.

74. The aeration method which offers the highest efficiency.

A. Spray nozzle method

B. Cascade aerator method

C. Tray tower method

D. Diffused air method

Ans. C

Sol. Tray tower method offers the highest efficiency among all the methods of aeration. This is because the area is increased multiple times in this method. The trays of increasing size are installed one below the other with small perforations at the bottom of each plate.

75. What is the size of the coarse screen used in pretreatment of water?

A. 25 mm

B. 50mm

C. 75mm

D. 60 mm

Ans. A

Sol. Coarse screens are used in the form of bars of 25mm diameter size and are spaced at 75mm to 100mm centers.

76. The head loss through screen depends on

A. Shape of screen elements

B. Open area, block area

C. Approach velocity

D. material of their construction, approach velocity

Ans. D

Sol. Head loss= $H_L = \dfrac{k}{2g}(v^2 - u^2)$

k= constant depends on material of construction

v= velocity of water through screens

u=velocity of approach

77. How many types of aerators are commonly used in the treatment of water?

A. 1

B. 2

C. 3

D. 4

Ans. D

Sol. There are 4 types of aeration methods:

Cascade aerator

Tray tower method

Diffused air method

Spray nozzle method

78. Which of the following sequences is the most suitable for treating raw surface water to make it suitable for drinking purposes?

A. Screening>filtration>sedimentation>disinfection

B. Screening> sedimentation>disinfection>filtration

C. sedimentation>disinfection>filtration>screening

D. screening>sedimentation>filteration>disinfection

Ans. D

Sol. the correct sequence of treatment of water includes:

1. screening

2. aeration

3. coagulation

4. flocculation

5. sedimentation

6. filtration

7. disinfection

8. softening

9. de-ferrisation

10. de-salination

79. Which one of the following statement provides the best argument that direct shear tests are not suited for determining shear parameters of a clay soil?

A. Failure plane is not the weakest plane

B. Pore pressures developed cannot be measured

C. satisfactory strain levels cannot be maintained

D. Adequate consolidated cannot be ensured

Ans. B

Sol. Since pore water pressure measurement is not possible in direct shear test, effective analysis cannot be done and hence triaxial test has to be done to determine shear parameter of clay soil.

80. The rate at which saturate clay or other soil undergo consolidation when subjected to an increase in pressure called

A. coefficient of volume change

B. Coefficient of consolidation

C. Compression index

D. Coefficient of compression

Ans. B

Sol. The rate at which saturate clay or other soil undergo consolidation when subjected to an increase in pressure called Coefficient of consolidation (C_v)

81. For drained condition in NC clay soil sample the failure envelop passes through

    A. Origin
    B. C distance on abscissa axis
    C. C distance on ordinate axis
    D. Depends on water content of sample

Ans. A

Sol. For drained condition in NC clay soil sample the failure envelop passes through Origin and for OC clay soil sample the failure envelop passes through C distance on ordinate axis

82. The initial and final void ratios of a clay sample in a consolidation test are 1.0 and 0.5 respectively. If the initial thickness of the sample is 2.4 cm, then its final thickness will be

    A. 1.3 cm
    B. 1.8 cm
    C. 1.9 cm
    D. 2.2 cm

Ans. B

Sol.

$$\Delta H = H_o \frac{\Delta e}{1 + e_o}$$

$$= 2.4 \times \frac{1 - 0.5}{1 + 1} = 0.6$$

Hence the final thickness= 2.4-0.6=1.8cm

83. The type of foundation most suitable for bridges

    A. Raft foundation
    B. Pile foundation
    C. Well foundation
    D. Combined foundation

Ans. C

Sol. The type of foundation most suitable for bridges is Well foundation.

    Note:

    Well foundation

    These foundations are used in underwater constructions. They are foundations with a hollow portion. These are the most commonly used deep foundations, especially for structures like bridges. They are generally built of timber, metal, reinforced concrete, masonry, etc.

84. A fill have volume of 1500m³ is to be constructed at a void ratio of 0.6. The borrow pit soil has void ratio of 1.2. The volume of soil required to be excavated from the borrow pit will be

    A. 10
    B. 27
    C. 30
    D. 40

Ans. B

Sol. **For void ratio 1.2**

    $e = \dfrac{V_{v1}}{V_s}$ (Volume Of solid remains constant)

$V_{v1} = V_s \times 1.2$

Total volume = $2.2V_s$

For void ratio 0.6

$e = \dfrac{V_{v2}}{V_s}$

$V_{v2} = V_s \times 0.6$

Total volume = $1.6V_s$

Change in volume = $\dfrac{2.2 - 1.6}{2.2}$ = 27%

85. Which of the following methods is not used for determination of water content?

   A. Pycnometer Method   B. Sand Bath Method

   C. Sand Replacement Method D. Torsion Balance method

Ans. C

Sol. Sand replacement method is used for determination of in-situ density.

   Rest all the three are used for determination of water content.

   Some other methods are:

   Alcohol Method

   Calcium Carbide method

   Radiation method

   Torsion Balance Method

86. If an infinite slope of clay at a depth 7m has cohesion of $2t/m^2$ and unit weight of $1t/m^3$, then the stability number is

   A. 0.29   B. 0.51

   C. 3.5   D. 4

Ans. A

Sol. Stability number = $\dfrac{C}{\gamma H} = \dfrac{2}{1 \times 7}$ = 0.29

87. Below the shrinkage limit soil

   A. Remains fully saturated   B. Does not remain fully saturated

   C. Remains fully dry   D. Remains submerged

Ans. B

Sol. As shrinkage limit is define as the lowest water content at which soil is just saturated.

   Below shrinkage limit the soil doesn't remain Fully saturated.

88. Which of the following soil has max surface area

   A. Colloidal   B. Clay

   C. Silt   D. Sand

Ans. A

Sol. Colloidal has max surface area

Colloidal > Clay > Silt > Sand

89. Pycnometer is used to determine specific gravity of soil and suitable for

A. All kind of soil   B. Cohesionless soil

C. Cohesive soil   D. None of the above

Ans. B

Sol. Removal of entrapped air is difficult for cohesive soil so this method is more suitable for **Cohesionless** soil.

90. Raft foundation are generally preferred to when the area required for individual footing, is more than:

A. 25% of total area   B. 30% of total area

C. 40% of total area   D. 50% of total area

Ans. D

Sol. Raft foundation are generally preferred whenarea required for individual footing is morethan 50%.

91. Average permeability (K_z) for flow perpendicular to the bedding planes in a layered soil is

Where K_1, K_2,….K_n- are co-efficient of permeability of respective layer

H_1, H_2, …. H_n- are thickness of respective layer.

A. $K_z = \dfrac{K_1 + K_2 + …. + K_n}{n}$

B. $K_z = \dfrac{K_1 H_1 + K_2 H_2 + …. + K_n H_n}{H_1 + H_2 + … + H_n}$

C. $K_z = \dfrac{H_1 + H_2 + …. + H_n}{\dfrac{H_1}{K_1} + \dfrac{H_2}{K_2} + … + \dfrac{H_n}{K_n}}$

D. $K_z = \dfrac{H_1 + H_2 + …. + H_n}{\dfrac{K_1}{H_1} + \dfrac{K_2}{H_2} + … + \dfrac{K_n}{H_n}}$

Ans. C

Sol.
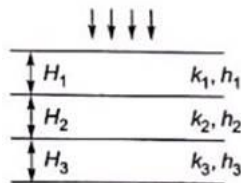
H_1, H_2, H_3 = thickness

H_1, h_2, h_3 = head loss

K_1, k_2, k_3 = permeability

$h_1 = h_1 + h_2 + h_3$

and $H = H_1 + H_2 + H_3$

$$Q = k_1 i_1 = k_v \frac{h}{H} = k_1 i_1 = k_2 i_2 = k_3 i_3$$

$$Q = k_1 i_1 A = k_2 i_2 A = k_3 i_3 A$$

$$Q = ki = k_1 i_1 = k_2 i_2 = k_3 i_3$$

$$\frac{kh}{H} = \frac{k_1 h_1}{H_1} = \frac{k_2 h_2}{H_2} = \frac{k_3 h_3}{H_3}$$

$$h_1 + h_2 + h_3 = h$$

$$h\left(\frac{k_v H_1}{Hk_1} + \frac{k_v H_2}{Hk_2} + \frac{k_v H_3}{Hk_3} \right) = h$$

$$k_v = \left(\frac{H}{\frac{H_1}{K_1} + \frac{H_2}{K_2} + \frac{H_3}{K_3}} \right)$$

*

92. Which of the following statements are correct?

A. Coefficient of consolidation is inversely proportional to the liquid limit

B. Coefficient of consolidation is inversely proportional to the plasticity index

C. Coefficient of consolidation is inversely proportional to the coefficient of volume change

D. All of the above

Ans. D

Sol. * Coefficient of consolidation is inversely proportional to the liquid limit

* Coefficient of consolidation is inversely proportional to the plasticity index

* Coefficient of consolidation is inversely proportional to the coefficient of volume change

93. The ratio between volume and voids to the volume of solids is called

A. void ratio   B. Porosity

C. air content   D. degree of saturation

Ans. A

Sol. Void ratio $(e) = \dfrac{V_v}{V_s} = \left(\dfrac{V_a + V_w}{V_s} \right)$
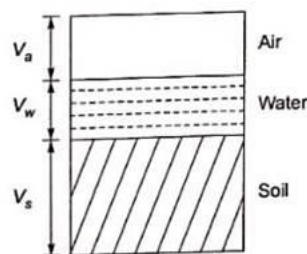
94. Method of applying water directly to the root zone of the plant is called

A. Check flooding   B. Furrow irrigation

C. Drip irrigation   D. Sprinkler irrigation

Ans. C

Sol. Drip irrigation is the latest method of irrigation. In this method water and fertilizer is supplied slowly and directly to the rootzone of the plants in order to minimize the losses due to evaporation and percolation.

Note:

Different methods of irrigation

* free flooding

* Border flooding

* Check flooding

* Basin flooding

* Furrow method

* Sprinkler method

95. Soil becomes, practically infertile if its pH value is

A. 1

B. 4

C. 11

D. 14

Ans. C

Sol. Soil becomes, practically infertile if its pH value is 11

96. Lacey assumed the shape of channel carrying incoherent alluvium as

A. Rectangular

B. Trapezoidal

C. Semi elliptical

D. Parabolic

Ans. C

Sol. According to Lacey theory, there is only one section and only one longitudinal slope at which the Chanel will carry a particular discharge with particular grade. He found that in final regime, the channel cross-section becomes semi elliptical.

97. In case of siphon aqueduct, the High flood level of the drain is

A. Above the canal bed

B. Below the bottom of channel

C. In level with the canal bed

D. None of the above

Ans. A

Sol. When the high flood level of drainage is higher bed level of the canal, then it is called siphon aqueduct.

Note:

When the bed level of canal is higher than the highest flood level of the drainage, then it is called aqueduct.

98. Water shed canal is also known as

A. Side slope canal

B. Contour canal

C. Ridge canal

D. All the above

Ans. C

Sol. <u>Ridge canal or water shed canal</u>

A canal which is aligned along the water shed line is known as watershed canal. This canal can irrigate the areas on both sides.

<u>Note:</u>

<u>Contour canal</u>

A canal which is aligned parallel to the contours of a country is called contour canal.it can irrigate only on one side of the canal

<u>Side slope canal.</u>

A canal which is aligned perpendicular to the contours of a country is called side slope canal. In side slope canal cross drainage works are completely eliminated.

99. The following are the types of

(i) Plinth area method

(ii) Cubical content method

(iii) Cost Index method

(iv) Bay- method

A. Detailed estimate   B. Approximate estimate

C. Supplementary estimate   D. Centre line estimate

Ans. B

Sol. The different types of estimates are as follows:

(i) Preliminary/approximate/abstract/ rough cost estimate

(ii) Plinth area estimate

(iii) Cube rate or cubical content estimate

(iv) Approximate quantity method estimate

(v) Detailed estimate or item rate estimate

(vi) Revised estimate

(vii)Supplementary estimate

(viii)Annual repair or maintenance estimate

Approximate estimate: It is an approximate or rough estimate prepared to obtain an approximate cost in a short time. The given methods are types of approximate estimate.

100. The area under β -distribution curve is divided into two equal parts by

A. Most likely time   B. Expected time

C. Optimistic time   D. Pessimistic time

Ans. B

Sol. Expected time is the most probable time of completion of activity and hence has a probability 50%. Therefore, it divide the area under β - distribution curve into 2 equal halves.

101. Select the related figure from the given alternatives.

    Question Figures:

    A.

    B.

    C.

    D.
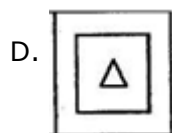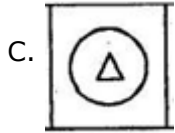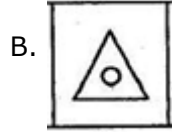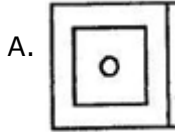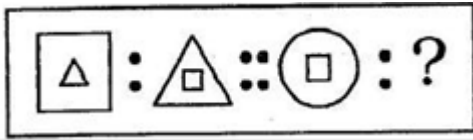
Ans. A

Sol. From first figure to second figure both the designs interchange positions as well as size.

102. **Directions:** In each of the following questions, which answer figure will complete the pattern in the question figure?

    Question Figure

    A.

    B.

    C.

    D.
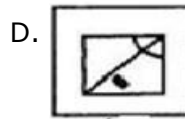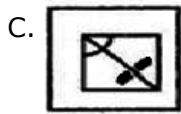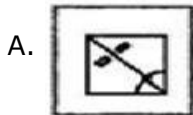
Ans. C

Sol. Option C will complete the figure.

103. Select the mirror image of the given figure when the mirror is placed to the right of the figure.

    SECRETARY

    A. ЯRATƎЯƆƎƧ

    B. ЯRATƎЯƆƎƧ

    C. ЯRATƎЯƆƎƧ

    D. **ЯRATƎЯƆƎƧ**

Ans. D

Sol.   The mirror image is:

SECRETARY | **ƎCRETARY**

Hence, the correct option is D.

104.   **Direction**: First 8 numbers, 1 to 8, are written from top to bottom. The letters of word 'Dear' are written in alphabetical order against each odd number. There are 2 letters between N and R. There are 3 letter between G and I. G is above I. K is written against number 8. (No letter is repeated against any number).

How many alphabets in English alphabetical series are there between the alphabets written against numbers 5 and 6?

A. 0   B. 1

C. 2   D. 3

E. 4

Ans.   D

Sol.   At E is written against 5 and I is written against 6 and total 3 letters are there between them, which is F, G and H.

Dear is written against odd number in alphabetical order. Odd numbers are- 1, 3, 5, 7 so A, D, E and R is written against them respectively. Two letters between N and R so N is written against 4. 3 letters between G and I and G is above I, so G is written against 2 and I is written against 6. K is written against 8

1	A
2	G
3	D
4	N
5	E
6	I
7	R
8	K

105.   **Direction:** In question below are given three or four statements followed by two or three conclusions numbered I, II and III. You have to take the given statements to be true even if they seem to be at variance with commonly known facts and then decide which of the given conclusions logically follows from the given statements, disregarding commonly known facts.

Statements:

Some pens are stars.

All stars are snow.

No star is a moon.

Some moon are ears.

Conclusion:

I. Some snow are moon.

II. At least some moon being snow is a possibility.

III. Some pen can never be ear, is a possibility.A. All follow

B. Only I not follow

C. Only II and III not follows

D. Either I or II and III follow

E. None of these

Ans. B

Sol.
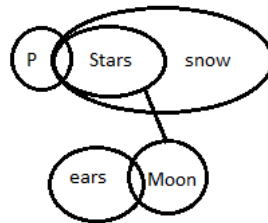
106. The rate of violent crime in this state is upto 30% from Last year. The fault lies entirely in our system of justice. Recently our judges' sentences have been so lenient that criminals can now do almost anything without fear of a long prison term.

    The argument above would be weakened if it were true that

    A. 85% of the other States in the nation have lower crime rates than does this state

    B. white-collar crime in this state has also increased by over 25% in the Last year

    C. 35% of the police in this state have been laid off in the last year due to budget cuts

    D. polls show that 65% of the population in this State opposes capital punishment

    E. None of the above

Ans. C

Sol. Thus the increase in crime rate has been contributed by other factors, not leniency in the punishment.

107. Which of the following cube in the answer figure cannot be made based on the unfolded cube in the question figure?

A.   B.

C.   D.
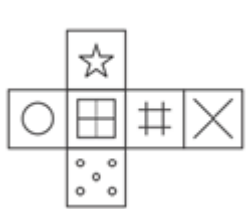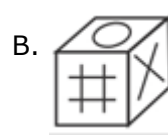
Ans. B

Sol. will be opposite to

 will be opposite to

 will be opposite to

Hence, the correct option is **B**

108. If in the word '**BANQUET'**, all the vowels are changed to the next letter and all the consonants are changed to the previous letter. Which of the following letters is fourth from the right end?

A. P   B. A

C. F   D. B

E. None of the above

Ans. A

Sol. After changing all the vowels to the next letter and all the consonants to the previous letter, we have

Hence, P is the fourth letter from the right end.

109. Pointing to a woman, Nirmal said, "She is the only daughter of my wife's grandfather's only child". How is the woman related to Nirmal?

A. Wife   B. Sister-in-law

C. Sister   D. Data inadequate

E. None of these

Ans. A

Sol. Women = Daughter of Nirmal's wife's grandfather only child

= daughter of Nirmal's wife's father

= Nirmal's wife

Hence option A is correct

110. A girl was 5 km away from her house towards North-West direction. A DOG was 3 km away towards North from the GIRL's house. Then she moved 3 km towards South and started standing towards west of the house. Again, the girl moved another 3km towards south and started facing towards her house and the DOG came back to the house. What is the final distance between the DOG & the GIRL and in which direction GIRL facing finally?

A. 5 km and North-East

B. 6 km and North

C. 10 km and East

D. None of these b

Ans. A

Sol. 5km and North-East

Initially the girl moves towards north-west for 5km from the house i.e. *Ha=5 km.*

Again the girl moves 3 km towards south i.e. *ab=3 km* and started standing west of the house

For the last time the girl moves 3km towards south i.e. *bc = 3 km*

The dog later moved from d to H, I.e. from standing north he returned back to GIRL's house.
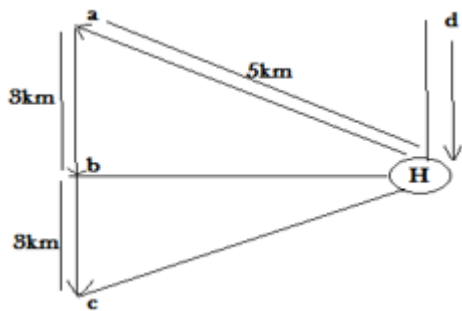
Since, the GIRL moved equal distance 3km from north-west to west of the house and west to south-west of the house in a straight line. So, girl is at equal distance from the house as she was while in *Ha i.e. Ha= cH = 5km* from the house or she is standing 5km away from the DOG's final position

The GIRL is facing towards her house finally i.e. towards north-east.

Hence the answer is 5 km and North-East

111. K is more beautiful than B. B Is not as beautiful as Y.J is not as beautiful as B or Y. Whose beauty is in the least degree?

A. B

B. J

C. Y

D. K

Ans. B

Sol. From the question,

K > B

Y > B

B, Y > J

K, Y > B > J

Hence, option B is correct.

112. If '+' means '÷', '×' means '+', '—' means '×' and '÷', means '—', then which of the following equations is correct?

A. 36 × 6 + 3 − 2 < 20

B. 36 × 6 + 3 × 2 > 20

C. 36 + 6 × 3 + 2 = 20

D. 36 + 6 − 3 > 2 x 20

Ans. B

Sol. 36 × 6 + 3 × 2 > 20

=>36+6÷3+2>20

=>36+2+2>20

Hence Option B is correct

113. A father's age is now three times that of his elder daughter. Five years back, his age was eight times that of his younger daughter. If the difference of ages of the two daughters is 5 years, what is the age of the father now?

A. 55

B. 50

C. 60

D. 45

Ans. D

Sol.

$Let\ the\ age\ of\ Daughter = x$

$so\ father = y$
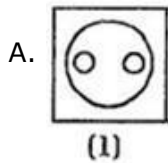
$Elder\ daughter = \dfrac{y}{3}$

$A/q,$

$y - 5 = 8(x - 5)$

$\Rightarrow 8x - y = 35 - - - -(I)$

$Elder\ daughter = \dfrac{x}{3} - y = 5 \Rightarrow y = \dfrac{x}{3} - 5 - - - -(II)$
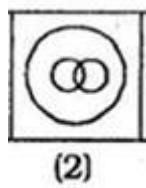
$By\ solving\ we\ get\ Ftaher\ age = 45 years.$

114. Choose the correct figure that represents the given relation :

    Mountains, Forests, Earth

    A.
    (1)

    B.
    (2)

    C.
    (3)

    D.
    (4)
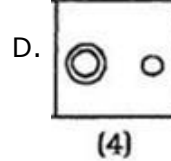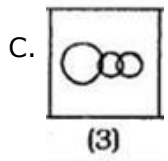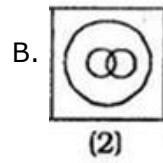
Ans. B

Sol. Forests are also found on Mountains, but both are found on the Earth.

(2)

115. Which of the following Indian authors has won the India's richest JCB Prize for Literature 2019?

    A. Madhuri Vijay
    B. Jhumpa Lahiri
    C. Chitra Banerjee Divakaruni
    D. Kiran Desai
    E. Amish Tripathi

Ans. A

Sol. * U.S. based-Indian author Madhuri Vijay's debut novel, "The Far Field" has won 2019 JCB prize for Literature (most expensive Indian award for writing).

    * Taking the reader through a complex personal story, The Far Field is set against the backdrop 1990's Kashmir conflict

    * She also received the Rs 25 lakh as the prize money, a sculpture by Delhi artist duo Thukral & Tagra entitled Mirror Melting.

    * The novel published by Fourth estate India

116. Which actor unveiled the ICC World Cup 2020 trophies for the men's and women's tournament at the Melbourne Cricket Ground (MCG)?

    A. Kareena Kapoor
    B. Anushka Sharma
    C. Deepika Padukone
    D. Aishwarya Rai
    E. Priyanka Chopra

Ans. A

Sol. * Bollywood actor Kareena Kapoor unveiled the ICC World Cup trophies for the men's and women's tournament at the Melbourne Cricket Ground (MCG).

* The 2020 ICC Women's World Cup is slated to get underway from February 21 with Australia hosting India in the inaugural fixture.

* The men's event will begin from October 19 with Bangladesh taking on a yet-to-qualify team.

117. Which Indian power company and Japanese energy major JERA have inked a pact with a group of banks for financing their new gas-fired thermal power generation project in Bangladesh?

A. Adani Power   B. Tata Power

C. Reliance Power   D. NTPC

E. NHPC

Ans. C

Sol. • Reliance Power and Japanese energy major JERA have inked a pact with a group of banks for full financing, totalling USD 642 million (approx Rs 4,798 crore), for their new gas-fired thermal power generation project in Bangladesh.

• Reliance Power and JERA, through their project company, are developing a new 745 MW natural gas combined-cycle power project in Meghnaghat in Bangladesh.

• Both partners will develop a new 745 MW natural gas combined-cycle power project in Meghnaghat in Bangladesh.

• In September, 2019 Reliance Power inducted JERA as a partner for the 750 mw-gas based combined cycle power project in Bangladesh as a part of its understanding with the country in 2015 to set up a total of 3,000 mw.

118. Which state Government announced the New Industrial Policy 2020 for the State, with an expected average annual outlay of up to Rs 8,000 crore, which is meant to provide incentives to the industries?

A. Kerala   B. Karnataka

C. Tamil Nadu   D. Gujarat

E. Maharashtra

Ans. D

Sol. • New Industrial Policy 2020 for the State to provide an estimated Rs 40,000 crore as subsidies to industries in the next 5 years. The new policy is in line with the Atma Nirbhar Bharat Abhiyan AND replaces the Gujarat Industrial Policy 2015.

• Gujarat will become the 1st state to "delink incentives from State Goods and Service Tax(SGST)", where Large industries will be provided up to 12% of fixed capital investment (FCI) to set up manufacturing operations in the state in form of capital subsidy.

119. Panna national park is located in which state?

    A. Karnataka

    B. Uttar Pradesh

    C. Madhya Pradesh

    D. Jharkhand

    E. West Bengal

Ans. C

Sol. • Panna National Park is located in Madhya Pradesh.

    • Recently, tiger has died in Panna National Park, Madhya Pradesh – the fifth in seven months.

120. What is the theme of the World Day for Audiovisual Heritage 2019?

    A. Protect and Share Your Visual Story

    B. Engage the Past Through Sound and Image

    C. It's Your Story – Don't lose it

    D. Discover, Remember and Share

    E. Our Life- Don't waste it

Ans. B

Sol. * The World Day for Audiovisual Heritage (WDAH) was celebrated to raise awareness of the significance and preservation of recorded sound and audiovisual documents (films, sound and video recordings, television and radio programmes) for future generations.

    * The theme for the year 2019 is "Engage the Past Through Sound and Images".

    * The day was approved at UNESCO (United Nations Educational, Scientific and Cultural Organization) general conference in 2005 & it was observed for the first time on October 27, 2007.

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