BTSC JE CIVIL

Q1. The combined correction for curvature and refraction for a distance of 3400 m will be nearly
(a) 0.2 m
(b) 0.4 m
(c) 0.6 m
(d) 0.8 m

Q2. A 100 m tape is suspended between the ends under a pull of 200 N. If the weight of the tape is 30 N, the correct distance between the tape ends will be nearly
(a) 100.5 m
(b) 100.3 m
(c) 100.1 m
(d) 99.9 m

Q3. A coarse-grained soil has a void ratio of 0.78 and specific gravity as 2.67. The critical gradient at which a quick sand condition occurs will be
(a) 0.62
(b) 0.74
(c) 0.82
(d) 0.94

Q4. Which of the following assumptions of the Rankine theory of lateral earth pressure are correct?
1. The soil mass is semi-infinite, homogeneous, dry and cohesionless.
2. The ground surface is a plane which may be horizontal or inclined.
3. The wall yields about the base and thus satisfies the deformation condition for plastic equilibrium.
(a) 1 and 2 only
(b) 1 and 3 only
(c) 1, 2 and 3
(d) 2 and 3 only

Q5. The ratio of the horizontal stress to the vertical stress is called coefficient of
(a) Active earth pressure
(b) Passive earth pressure
(c) Earth pressure
(d) Plastic earth pressure

Q6. A bed consists of compressible clay of 4 m thickness with pervious sand on top and impervious rock at the bottom. In a consolidation test on an undisturbed specimen of clay from this deposit 90% settlement was reached in 4 hours. The specimen was 20 mm thick. The time for the building founded over this deposit to reach 90% of its final settlement will be
(a) 91 years
(b) 82 years
(c) 73 years
(d) 64 years

Q7. A 30 cm square bearing plate settles by 8 mm in the plate load test on cohesionless soil when the intensity of loading is $180\ kN/m^2$. The settlement of a shallow foundation of 1.5 m square under the same intensity of loading will be nearly
(a) 30 mm
(b) 26 mm
(c) 22 mm
(d) 18 mm

Q8. When the observed value of Nexceeds 15, the corrected penetration number N_C as per Terzaghi and Peck recommendation in the silty fine sands will be
(a) $15-\frac{1}{2}(N_R-15)$
(b) $15-\frac{1}{2}(N_R+15)$
(c) $15+\frac{1}{2}(N_R-15)$
(d) $15+\frac{1}{2}(N_R+15)$

Q9. Calculate the maximum shear strain at the point where principal strains are
100×10^{-6} and -200×10^{-6}
(a) 100×10^{-6}
(b) 200×10^{-6}
(c) 300×10^{-6}
(d) 400×10^{-6}

Q10. A solid shaft transmits a torque T. the allowable shear stress is τ. The diameter of
(a) $\sqrt[3]{\frac{16T}{\pi\tau}}$
(b) $\sqrt[3]{\frac{32T}{\pi\tau}}$
(c) $\sqrt[3]{\frac{4T}{\pi\tau}}$
(d) $\sqrt[3]{\frac{64T}{\pi\tau}}$

Q11. The ratio of Euler's buckling loads of columns with same parameter having
1. Both ends fixed
2. One and fixed and the other end free, is
(a) 1
(b) 4
(c) 8
(d) 16

Q12. Two springs of stiffness K_1 & K_2 respectively are connected in series, what will be the stiffness of the composite spring-

(a) $K = \frac{K_1+K_2}{K_1K_2}$
(b) $K = K_1 K_2$
(c) $K = K_1 + K_2$
(d) $K = \frac{K_1K_2}{K_1+K_2}$

Q13. Calculate the quantity (cubic meter) of the cement required for 1 cubic meter of brick work with cement mortar (1:4).
(a) 0.05
(b) 0.06
(c) 0.2
(d) 0.24

Q14. What is the approximate cost of the labour as a percentage of the total cost of the building?
(a) 0.1
(b) 0.25
(c) 0.4
(d) 0.05

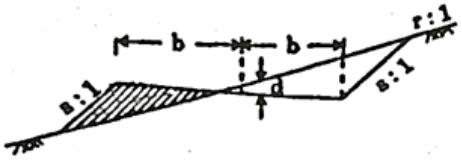
Q15. Central line method for estimation is suitable for .....
(a) Building having large number of cross walls
(b) Building having large numbers junctions
(c) Wall having different widths
(d) Walls having same widths

Q16. Find the value of building if the plinth area 350m^2 and the cost of construction of a similar building in a similar locality is Rs. 1700/m^2
(a) 595003
(b) 595002
(c) 595001
(d) 595000

Q17. Estimate for electrical wiring is prepared on the basis of?
(a) Voltage
(b) Number of points
(c) Number of appliances
(d) Power

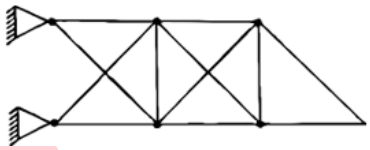
Q18. Calculate the quantity of the earth works in cubic meter for a canal embankment of 100 m long having cross section areas at the two sections are 20 square meters and 80 square meters. Use trapezoidal method.
(a) 2000
(b) 5000
(c) 7000
(d) 10000

Q19. The cross-section of a road partly in banking and partly in cutting is shown in the following figure, the area of the shaded portion is:



(a) $\frac{1}{2} \times \frac{(b-rd)^2}{r-s}$
(b) $\frac{1}{3} \times \frac{(b-rd)^2}{r-s}$
(c) $\frac{1}{2} \times \frac{(b+rd)^2}{r-s}$
(d) $\frac{1}{3} \times \frac{(b+rd)^2}{r-s}$

Q20. What is the total degree of indeterminacy (both internal and external) of the cantilever plane truss shown in the figure?



(a) 2
(b) 3
(c) 4
(d) 5

Q21. The conditions required to be satisfied for the analysis of indeterminate structure are-
(a) Equilibrium
(b) Compatibility
(c) Force-displacement
(d) All of these

Q22. Which method not fall under the category of displacement method?
(a) Moment distribution method
(b) Slope deflection method
(c) Method of consistent deformation
(d) Kani's method

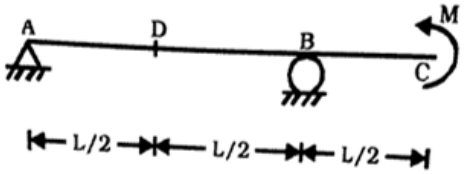
Q23. Static indeterminacy of a beam fixed at both the ends is:
(a) 6
(b) 3
(c) 2
(d) 1

Q24. Moment distribution method of structural analysis is applicable to:
(a) Stable but statically indeterminate structure
(b) Stable but statically determine structures
(c) Unstable but statically indeterminate structure
(d) Unstable but statically determinate structures

Q25. The unit of elastic modulus is the same as those of
(a) Stress, shear modulus and pressure
(b) Strain, shear modulus and force
(c) Shear modulus, stress and force
(d) Stress, strain and pressure

Q26. Which of the following statements is incorrect about Poisson's ratio:
(a) Can be negative
(b) Can be zero
(c) Can be positive
(d) Can be Fractional value

Q27. Shear force at the mid-span point D in the following beam is



(a) Zero
(b) 2 M/L
(c) M/L
(d) 3 M/L

Q28. In an experiment it found that the bulk modulus of a material is equal to its shear modulus. This Poisson's ratio is.
(a) 0.125
(b) 0.250
(c) 0.375
(d) 0.500

Q29. The ratio of actual evapo–transpiration to potential evapo-transpiration is in the range
(a) 0.0 to 0.4
(b) 0.6 to 0.9
(c) 0 to 1
(d) 1.0 to 2.0

Q30. If area of the catchment is 62.5sq. mm and axial length of the catchment is 10mm, the form factor will be:
(a) 0.625
(b) 0.31
(c) 6.25
(d) 1

Q31. For calculating the maximum flood discharge in Northern India by Dicken's formula the value of coefficient 'C' is
(a) 13.9
(b) 19.5
(c) 11.4
(d) 22.4

Q32. Eutrophication of water bodies is caused by
(a) Discharge of toxic substances
(b) Excessive discharge of nutrients
(c) Excessive discharge of suspended solids
(d) Excessive discharge of chlorides

Q33. Irrigation efficiency of an irrigation system is the ration of:
(a) Water actually stored in root zone to water delivered to the farm
(b) Water actually utilized by growing crops to water delivered from the source
(c) Water reaching the farm to water delivered from the source
(d) Crop yield to total amount of water used in a field

Q34. Which of the following crops has longest base period been regard to irrigation?
(a) Rice
(b) Maize
(c) Sugarcane
(d) Cotton

Q35. If the optimum depth of kor watering for a crop is 15.12 cm, the outlet factor for the crop for four weeks period in hectare/cumec is
(a) 1200
(b) 1400
(c) 1600
(d) 1800

Q36. If the duty of water for a crop of base period 120 days is 1400 hect/cumec, then delta (Δ) for the crop is
(a) 740 mm
(b) 843 mm
(c) 949 mm
(d) 1056 mm

Q37. The maximum irrigation requirement of rice crop is exhibited its
(a) Maximum delta value
(b) Maximum duty value
(c) Minimum duty value
(d) None of the above

Q38. If the sediment size is 0.81 mm the silt factor will be -
(a) 1.721
(b) 1.010
(c) 0.900
(d) 1.584

Q39. One of the benefits of lining water canals for irrigation is that, it:
(a) Helps increase the command area
(b) Increases potential chances of beaching
(c) Increases channel cross section
(d) Increases seepage of water

Q40. A one dimensional flow is one which
(a) Is uniformly flow
(b) Is steady uniform flow
(c) Takes place in straight lines
(d) Involves zero transverse component of flow

Q41. A pitot tube is used to measure
(a) Pressure
(b) Difference in pressure
(c) Velocity of flow
(d) None of these.

Q42. The property of steam function ψ is:
(a) ψ is constant everywhere on any stream line
(b) The flow around any path in the fluid is zero for continuous flow
(c) The velocity vector may be found by differentiating the stream function
(d) All the above.

Q43.
The compressibility of the fluid is given as $5 \times 10^{-11}\ Pa^{-1}$. What is the Bulk Modulus (GPa) of fluid?
(a) 25
(b) 20
(c) 15
(d) 10

Q44. If the volume of a liquid weighing 3000 kg is 4 cubic meters, 0.75 is its
(a) Specific weight
(b) Specific mass
(c) Specific gravity
(d) None of these

Q45. A liquid compressed in cylinder has a volume of 0.04 m^3 at 50 N/cm^2 and a volume of 0.039 m^3 at 150 N/cm^2. The bulk modulus of elasticity of liquid is:
(a) 400 N/cm^2
(b) 4000 N/cm^2
(c) 40000 N/cm^2
(d) 40 N/cm^2

Q46. Specific weight of sea water is more than that of pure water because it contains
(a) Dissolved air
(b) Dissolved salt
(c) Suspended matter
(d) All options are correct

Q47. The vapor pressure over the concave surface is
(a) Less than the vapor pressure over the plane surface
(b) Equal to the vapor pressure over the plane surface
(c) Greater than the vapor pressure over the plane surface
(d) Zero

Q48. Consider the following statements;
1. Piezometer is used to measure small variation of pressure above or below ambient pressure.
2. Thixotropic fluid exhibits decrease in viscosity with time.
Which of the above statements is/are correct?
(a) Only 1
(b) Only 2
(c) Both 1 and 2
(d) Neither 1 nor 2

Q49. A pump has a delivery head of 75 m water. Which of the following can be a convenient method for measuring this pressure?
(a) Piezometer
(b) Pitot rube
(c) Single column manometer with mercury
(d) Bourdon gauge

Q50. A water supply scheme has to be designed for a city having a population of 100,000 people. If the average consumption is 250 lpcd the estimated average daily draft is –
(a) 35 MLD
(b) 25 MLD
(c) 45 MLD
(d) 15 MLD

Q51. The rate of demand of water per capita per day for population between 50,000 to 2,00,000 is –
(a) 110 to 150 litres
(b) 180 to 210 litres
(c) 150 to 180 litres
(d) 210 to 240 litres

Q52. The population forecasting method which that is based on the assumption that the percentage increase in population from one decade to the other decade remains constant is called……
(a) Incremental increase
(b) Geometrical increase
(c) Arithmetical increase
(d) Decrease rate of growth

Q53. The Buston's formula for estimating water required for fire demand is ____.
(a) $7500\sqrt{P}$
(b) $3182\sqrt{P}$
(c) $4637\sqrt{P}$
(d) $5663\sqrt{P}$

Q54. Turbidity is the measure of relative clarity of a liquid (water), and one of its units of measurement is
(a) MPN
(b) NTU
(c) Moles
(d) Grams

Q55. Workability of concrete is directly proportional to:
(i) Time of transit
(ii) Water cement ratio
(iii) Grading of aggregate
(iv) Strength of concrete
(v) Aggregate cement ratio
(a) (ii), (iii), (v)
(b) (ii), (iii)
(c) (iii), (iv), (v)
(d) (i), (ii), (iv)

Q56. Presence of oil in water for concrete:
(a) Gives smooth surface
(b) Gives more slumps
(c) improves strength
(d) reduces strength

Q57. If Q is the total quantity of water required by a town per year in litres, and P is the population of the town, then the per capita demand of water will be:
(a) $\frac{2Q}{P\times270}$
(b) $\frac{2Q}{P\times365}$
(c) $\frac{Q}{P\times365}$
(d) $\frac{Q}{P\times270}$

Q58. What is the peak factor of population above 2 lakh?
(a) 1.0
(b) 1.9
(c) 3.9
(d) 2.0

Q59. The most common constiuents of alkalinity in natural water are measured by titrating the water sample with 0.02 N H_2SO_4 using _____.
(a) Phenolphthalein and methyl orange indicators
(b) Ferroin and phenolphthalein indicators
(c) Methyl orange and erichrome black-T indicators
(d) Erichrome black-T and Ferrion indicators

Q60. From the engineering point of view, sandstone and limestone belong to which types of rocks?
(a) Intrusive rock
(b) Igneous rock
(c) Metamorphic rocks
(d) Sedimentary rocks

Q61. A very thin sheet of wood which is cut from the round logs with 0.5 to 5 mm thickness is called:
(a) Blockboard
(b) Chipboard
(c) Veneer
(d) Fibre wood

Q62. The surface of a liquid acts like a stretched elastic membrane under tension. This is mainly due to _____.
(a) Viscosity
(b) Capillarity
(c) Surface tension
(d) Velocity of flow

Q63. The Central Pollution Control Board of India functions under the:
(a) Ministry of Environment, Forest and Climate Change
(b) Ministry of Science and Technology
(c) Ministry of Earth Sciences
(d) Ministry of Home Affairs

Q64. Which of the following is NOT a fundamental building block in estimating construction labour estimates?
(a) Work hour unit rates per quantity
(b) Project quantities
(c) Project owner
(d) Crew mix

Q65. The theory for the time rate of one-dimensional consolidation is NOT based on which of the following assumptions?
(a) The clay layer is homogeneous
(b) The compression of the soil layer is due to the change in volume only
(c) Darcy's Law is valid
(d) The clay layer is not saturated

Q66. For calculation of volume of earthwork, which of the following formulas assumes that short lengths in parabolic arcs are considered as parallel to each other?
(a) Trapezoidal rule formula
(b) Average area formula
(c) Mid-section formula
(d) Simpson's rule formula

Q67. For laminar flow through pipes, the Reynolds number should be:
(a) Greater than 4000
(b) 2000 to 3000
(c) Less than 2000
(d) 3000 to 4000

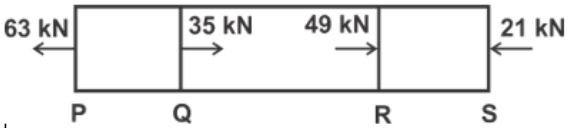
Q68. In which of the following cases, valuation is not required?
(a) Compulsory acquisition
(b) Buying and selling of property
(c) Security of loans against the property to be mortgaged
(d) A government building is to be constructed on government land

Q69. According to IS 456:2000, The expression for equivalent shear is given by _____
WHERE
V_U = SHEAR
V_E = EQUIVALENT SHEAR
T_U = TORSIONAL MOMENT
b = breadth of the beam
(a) $V_e = V_u + T_u/b$
(b) $V_e = V_u + 1.6\, b/T_u$
(c) $V_e = V_u - 1.6\, T_u/b$
(d) $V_e = V_u + 1.6\, T_u/b$

Q70. For which material the Poisson's ratio is more than unity?
A. Steel
B. Copper
C. aluminium
D. cast iron
(a) only A
(b) only B
(c) only C
(d) None of these

Q71. Percentage reduction of area in performing tensile test on cast iron may be of the order of
(a) 50%
(b) 25%
(c) 0%
(d) 15%

Q72. A cross – sectional bar of area 700 mm^2 is subjected to an axial load as shown in the figure below what is the value of stress (MPa) in the section QR



(a) 30
(b) 40
(c) 50
(d) 60

Q73. On the application of a given load, the length of a wire is stated to increase by 1 mm. if the same force is now applied to a wire of same material but of the length and radius twice the first, the extension produced would be
(a) 0.25 mm
(b) 0.5 mm
(c) 2.0 mm
(d) 4.0 mm

Q74. Consider a bar of length/and tapering uniformly from diameter d_2 to d_1 and subjected to axial load W. the extension of the bar will be
(a) $4Wl/\pi d_1 d_2 E$
(b) $4WEl/\pi d_1 d_2$
(c) $\pi WEl/4 d_1 d_2$
(d) $\pi Wl/4 d_1 d_2 E$

Q75. When a block of ice floating on water in a container melts, the level of water in the container-
(a) rises
(b) falls
(c) first falls and then rises
(d) remains the same

Q76. If φ is the velocity potential function in 2-D flow field, then the velocity components U and V are defined as –
(a) $U = \frac{\partial \phi}{\partial x}$ and $V = \frac{\partial \phi}{\partial y}$
(b) $U = \frac{-\partial \phi}{\partial x}$ and $V = \frac{-\partial \phi}{\partial y}$
(c) $U = \frac{-1\partial \phi}{\partial x}$ and $V = \frac{\partial \phi}{\partial y}$
(d) $U = \frac{\partial \phi}{\partial x}$ and $V = \frac{-\partial \phi}{\partial y}$

Q77. A pitot-static tube is used to measure the velocity of water in a pipe. The stagnation pressure head is 16 m and static pressure head 13.5 m. the velocity of flow is - (Velocity co-efficient = 0.98)
(a) 5.34 m/s
(b) 5.5 m/s
(c) 6 m/s
(d) 6.86 m/s

Q78. If a fluid jet discharging from a 75 mm diameter orifice has a 60 mm diameter at its vena-contracta, then its co-efficient of contraction will be-
(a) 0.32
(b) 0.64
(c) 0.96
(d) 1.64

Q79. For laminar flow in pipes the momentum correction factor is
(a) > 1
(b) 1.03
(c) 2.00
(d) 1.33

Q80. A structure through which discharge can be regulated is known as _____.
(a) Weir
(b) Orifice
(c) Notch
(d) Regulator

Q81. Which of the following Harappan sites used mud-bricks in ample for the construction of houses?
(a) Mohenjodaro
(b) Harappa
(c) Kalibangan
(d) Chanhudaro

Q82. The Mughal emperor who issued a Farman to English East India Company in 1717 to trade freely in Bengal is?
(a) Farrukhsiyar
(b) Bahadur Shah
(c) Jahandar Shah
(d) Shah Alam

Q83.Consider the following statements and choose the correct one?
1. In the First Round Table Conference, Dr. B.R. Ambedkar demanded separate electorates for the depressed classes.
2. INC did not take part in the first Round table Conference

(a) Only 1
(b) Only 2
(c) Both 1 and 2
(d) None of these

Q84. Which of the following was the Person of the British EIC who introduced the Subsidiary Alliance system in India?
(a) Sir John Shore
(b) Lord Wellesley
(c) Lord Cornwallis
(d) Lord Clive

Q85. How does La-Nina affect the Pacific Ocean?
(a) Decreases salinity of ocean
(b) Cools downs the temperature of water
(c) Maintains stable temperature of water
(d) Increases salinity of ocean

Q86. The order of the layer of the atmosphere from the earth's surface (moving away from the surface) is:
(a) Mesosphere - Troposphere - Stratosphere - Thermosphere
(b) Mesosphere - Stratosphere - Troposphere - Thermosphere
(c) Stratosphere - Troposphere - Mesosphere - Thermosphere
(d) Troposphere - Stratosphere - Mesosphere – Thermosphere

Q87. Which longitude has been selected as the Standard Meridian of India?
(a) 82°30'E
(b) 82°32'E
(c) 81°30'E
(d) 82°31'E

Q88. The architects of the Indian Constitution borrowed the concept of Directive Principles of state policy from which country Constitution?
(a) The Constitution of UK
(b) The Constitution of Ireland.
(c) The Constitution of USA.
(d) The constitution of Germany

Q89. Which of the following amendment Act makes the Right to Education the fundamental right to all the children under the age of 6-14 years by inserting Article 21A to the constitution?
(a) 86th Amendment
(b) 84th Amendment
(c) 89th Amendment
(d) 87th Amendment

Q90. Which of the following statements related to Money Bills is ***not*** correct?
(a) It cannot be introduced in the Council of States
(b) If any question arises whether the Bill is Money Bill or not, the decision of the Speaker is final
(c) In case of deadlock over a Money Bill, the president can summon a joint sitting of the Parliament
(d) A Money Bill cannot be introduced except on the recommendation of the president

Q91. Where is the Headquarter of Amnesty International?
(a) New York
(b) London
(c) Paris
(d) Geneva

Q92. Who is the author of the book 'Wings of Fire'
(a) Abul Kalam Azad
(b) Abdul Kalam
(c) Arundhati Roy
(d) Chetan Bhagat

Q93. Prime Minister Narendra Modi has inaugurated the first phase of the international airport at Mopa in north Goa recently. The airport has been named after _____.
(a) Manohar Parrikar
(b) Rajiv Gandhi
(c) Sushma Swaraj
(d) Arun Jaitley

Q94. Prime Minister Narendra Modi announced a new project under which India will provide essential medical supplies to any developing country affected by natural disasters or humanitarian crisis. What is the name of the project?
(a) Aarogya Nidhi
(b) Aarogya Vishesh
(c) Aarogya Maitri
(d) Aarogya Vidhi

Q95. In which battle was Siraj-ud–Daulah defeated by Lord Clive?
(a) Battle of Plassey
(b) Battle of Buxer
(c) Battle of Panipat
(d) Battle of Haldighati

Q96. NASA's Dragonfly mission to explore Titan is scheduled for launch in 2027. What is Titan?
(a) Jupiter's Moon
(b) Constellation
(c) Saturn's Moon
(d) Sun's Aurora

Q97. Panna National Park is a national park located in-
(a) Maharashtra
(b) Gujarat
(c)Madhya Pradesh
(d) Rajasthan

Q98. The famous Khajuraho Dance Festival was held in which state?
(a) Andhra Pradesh
(b) Odisha
(c) Kerala
(d) Madhya Pradesh

Q99. Which one of the following SI unit is not correctly matched?
(a) Work - Joule
(b) Force - Newton
(c) Mass - kg
(d) Pressure – Dyne

Q100. Which of the following is a chemical formula of quicklime?
(a) Ca_2O
(b) Ca_2CO_3
(c) CaO_2
(d) CaO

Solutions

S1. Ans.(d)
Sol.

$$\text{Combined correction (C)} = -0.06735\, d^2$$
$$= -0.0673 \times 3.4^2$$
$$= 0.77798 \text{ m}$$
$$\approx 0.8 \text{ m}$$

S2. Ans.(d)
Sol.

$$\text{Sag correction } (C_s) = \frac{w^2 l}{24 P_m^2}$$
$$C_s = \frac{30^2 \times 100}{24 \times 200^2}$$
$$= \frac{30 \times 30 \times 100}{24 \times 200 \times 200}$$
$$= \frac{9}{24 \times 2 \times 2} = \frac{9}{48 \times 2} = 0.09375 \approx 0.1 \text{ (negative)}$$

Measured length of tape= 100 m
Correct length of tape = 100 − 0.1
= 99.9 m

S3. Ans.(d)
Sol.
Critical hydraulic gradient,

$$i_c = \frac{G-1}{1+e} = \frac{2.67-1}{1+0.78}$$
$$= 0.938$$

S4. Ans.(c)

S5. Ans.(c)

Sol.

$$\frac{\text{Horizontal stress}}{\text{Vertical stress}} = \frac{\sigma_h}{\sigma_V} = K$$

K = Earth pressure coefficient.

S6. Ans.(c)

Sol.

By taking single drainage in field slab,

In lab, $(T_V)_{90} = C_V \frac{t}{d^2}$

$$\frac{(T_V)_{90}}{C_V} = \frac{4 \text{ hrs}}{(20\times10^{-3})^2}$$

In field, $(T_V)_{90} = C_V \frac{t}{d^2}$

$$t = \frac{(T_V)_{90}}{C_V} \times d^2 = \frac{4}{(20\times10^{-3})^2} \times 4^2$$

t = 18.26 years

Note : Answer is not matching, hence try assuming double drainage in laboratory.

In lab, $(T_V)_{90} = C_V \frac{t}{d^2} = C_V \times \frac{4 \text{ hrs}}{(10\times10^{-3})^2}$

In field, $(T_V)_{90} = C_V \frac{t}{(4\text{m})^2}$

$$t = \frac{(T_V)_{90}}{C_V} \times (4\text{ m})^2 = \frac{4}{(10\times10^{-3})^2} \times 4^2$$

= 73.059 years

Alternatively,

$$t \propto H^2$$

$$\frac{t_{field}}{t_{lab}} = \left(\frac{H_{field}}{H_{lab}}\right)^2$$

$$H_{lab} = \frac{20}{2} = 10 \text{ mm}$$

$$\therefore \quad t_{field} = \left(\frac{4\times10^3}{10}\right)^2 \times \frac{4}{24\times365} = 73 \text{ years}$$

S7. Ans.(c)

Sol.

B_f = 1.5 m. B_p = 0.3 m, S_p = 8 mm

For cohesionless soil,

$$\frac{S_f}{S_p} = \left\{\frac{B_f(B_p+0.3)}{B_p(B_f+0.3)}\right\}^2$$

$$S_f = 8\left\{\frac{1.5(0.3+0.3)}{0.3(1.5+0.3)}\right\}^2$$

= 22.22 mm

S8. Ans.(c)

S9. Ans.(c)

Sol.

Maximum shear strain (γ_{xy})

$$\frac{\gamma_{xy}}{2} = \frac{\epsilon_1 - \epsilon_1}{2}$$

$$\gamma_{xy} = 100\times10^{-6} - (-200\times10^{-6})$$

$$= 300\times10^{-6}$$

S10. Ans.(a)

Sol.

we know that, the torsion equation

$$\frac{\tau}{J} = \frac{\tau}{r} = \frac{G\theta}{L}$$

$$\frac{T}{J} = \frac{\tau}{r} \qquad \left[J = \frac{\pi}{32} d^4\right]$$

$$\frac{T}{\frac{\pi}{32}d^4} = \frac{\tau}{d/2}$$

$$\tau = \frac{16T}{\pi d^3}$$

$$d^3 = \frac{16T}{\pi\tau}$$

$$d = \sqrt[3]{\frac{16T}{\pi\tau}}$$

S11. Ans.(d)

Sol.

Euler's buckling load $P_{Cr} = \frac{\pi^2 EI}{le^2}$

For having both End fixed $[le = l/2]$

$$P_{CR} = \frac{\pi^2 EI}{(l/2)^2} = \frac{4\pi^2 EI}{l^2}$$

For having end fixed and the other end free, $B(le = 2l)$

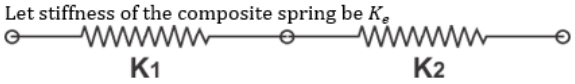
$$P_{Cr\ (one\ fixed\ or\ free)} = \frac{\pi^2 EI}{le^2} = \frac{\pi^2 EI}{(2l)^2} = \frac{\pi^2 EI}{4l^2}$$

$$Ratio = \frac{P_{CR(both\ fixed)}}{P_{Cr(one\ end\ free\ \ one\ fixed)}} = \frac{4\pi^2 EI/l^2}{\pi^2 EI/4l^2} = 16$$

S12. Ans.(d)

Sol.

Let stiffness of the composite spring be K_e



K_1 and K_2 are two springs connected in series for series combination,

$$\delta_C = \delta_1 + \delta_2$$

$$\frac{W}{K_e} = \frac{W_1}{K_1} + \frac{W_2}{K_2}$$

But,

$$W_1 = W_2 = W$$

$$\frac{1}{K_e} = \frac{1}{K_1} + \frac{1}{K_2}$$

$$K_e = \frac{K_1 K_2}{K_1 + K_2}$$

S13. Ans.(b)

Sol.

1 m^3 of dry volume of cement mortar is 0.3 m^3 of wet volume of cement mortar.

Proportion of cement mortar = 1:4

Quantity of cement in $1m^3 = \frac{0.30\times1}{5}$ = 0.06 m^3

S14. Ans.(b)

Sol.

$$\frac{Cost\ of\ labour}{Cost\ of\ building} = 25\%\ or\ \frac{1}{4}\ or 0.25$$

S15. Ans.(d)

Sol. Center line method→ This method is suitable for symmetrical cross-sections like circular, hexagonal and other geometric shapes. This method is suitable for walls have the same thickness. In this method the center line for each type worked out and then multiplied by the breadth and depth of respective item to get the total quantity.

S16. Ans.(d)

Sol.

Given, Plinth area = 350 m^2

Rate per sq. meter = 1700/m^2

Total cost = 350 × 1700 = 595,000 Rs.

S17. Ans.(b)

Sol. Estimate for electrical wiring is prepared on the basis of number of points. Cost for electrification is taken as 8% of total cost of construction.

S18. Ans.(b)

Sol.

Given,

$A_1 = 20\ m^2$

$A_n = 80\ m^2$

$Interval\ (d) = 100m.$

Volume of earthwork (V) by trapezoidal method →

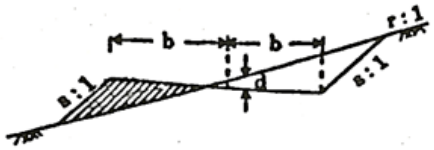
$$V = d\left[\left(\frac{A_1 + A_n}{2}\right) + A_2 + A_3 + \cdots\right]$$

$$= 100\left[\frac{20 + 80}{2}\right]$$

$$\boxed{V = 5000\ m^2}$$

S19. Ans.(a)

Sol.



The area of shaded portion or area of filling $= \frac{1}{2} \times \frac{(b-rd)^2}{r-s}$

The area of unshaded portion or area of cutting $= \frac{1}{2} \times \frac{(b+rd)^2}{r-s}$

S20. Ans.(a)

Sol.

No. of members (m) = 12

No. of external reactions (r_e) = 4

No. of joints (j) = 7

Degree of static indeterminacy $(D_s) = m + r_e - 2j$

$= 12 + 4 - (2 \times 7)$

$\boxed{D_s = 2}$

S21. Ans.(d)

Sol. The condition required to be satisfied for the analysis of indeterminate structure are equilibrium, compatibility and force-displacement relationship.

S22. Ans.(c)

Sol.

Method comes under displacement methods are-

→ slope deflection method

→ moment distribution method

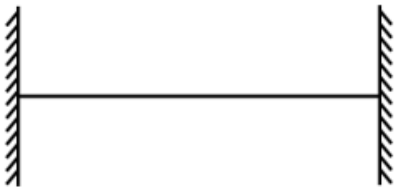
→ Kani's method

→ Minimum potential energy method.

S23. Ans.(b)

Sol.

Fixed beam→



Static indeterminacy $(D_i) = r - 3$

$= 6 - 3$

$\boxed{D_i = 3}$

S24. Ans.(a)

Sol. Moment distribution method of structural analysis is applicable to stable but statically indeterminate structures.

S25. Ans.(a)

Sol. The unit of elastic modulus is same as those of stress, shear modulus and pressure and unit of elastic modulus is N/mm^2.

S26. Ans.(a)

Sol. The Poisson's ratio is a property of material which cannot be negative.

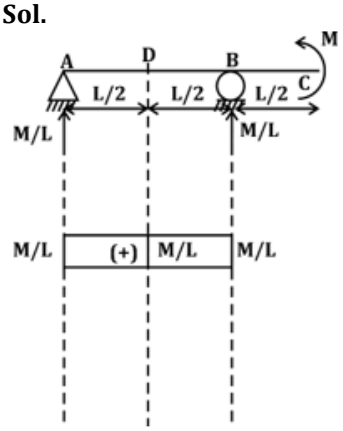
$\boxed{0 \le \mu \le 0.5}$

Poisson's ratio in elastic range = 0.3

Poisson's ratio in plastic range = 0.5

S27. Ans.(c)

Sol.



$R_A + R_B = 0$
$\sum M_A = 0$
$M + R_B XL = 0$

$$\boxed{R_B = -\frac{M}{L}}$$

$$\boxed{R_A = \frac{M}{L}}$$

S28. Ans.(a)
Sol.
Given bulk modulus (K) = Shear modulus (G)
Now,

$$\text{Poisson's ratio } (\mu) = \frac{3K-2G}{6K+2G} = \frac{3-2}{6+2} = \frac{1}{8} = 0.125$$

S29. Ans.(c)
Sol.
Ratio of Actual evapotranspiration (AET) & Potential evapotranspiration (PET) equal to zero to one.

$$\boxed{Aridity\ Index = \frac{PET-AET}{PET}}$$

S30. Ans.(a)
Sol.
Area if Catchment $=62.5mm^2$
Axial length =10 mm

$$\text{Form factor} = \frac{basin\ area}{(basin\ lenght)^2}$$
$$= \frac{62.5}{10\times10}$$
$$= 0.625$$

S31. Ans.(c)
Sol.

Dicken Formula

$$\boxed{Q = CA^{3/4}}$$

Q→ discharge
C→ Constant
A→ Area

Area	C
(1) North India	11.5
(2) Madhya India	14-19.5
(3) Western ghat	22-25

S32. Ans.(b)
Sol.
Eutrophication – When a body of water becomes overly enriched of water with mineral & nutrients which induces excessive growth of algae.

S33. Ans.(b)
Sol.

$$\boxed{Irrigation\ efficiency = \frac{water\ actually\ utilized\ by\ growing\ crops}{water\ deliver\ from\ source}}$$

S34. Ans.(c)
Sol. Sugarcane has longest base period in regards to irrigation.
→ Depth of water is 120 cm in sugarcane.
→ Optimum depth of kor watering for rice is 190 mm.

S35. Ans.(c)
Sol.
Δ =15.12 cm = 0.1512 metres
B= 4 week
=28day

$$D = \frac{8.64B}{\Delta}$$
$$= \frac{8.64\times28}{0.1512}$$

$$\boxed{D = 1600\ hactare/cumec}$$

S36. Ans.(a)

S37. Ans.(c)
Sol.
Maximum irrigation requirement means how much irrigation required for given area also called duty of this crop. it's unit of measurement is hectare per cumec.
→ For rice maximum irrigation requirement of is exhibited by its minimum duty values...

S38. Ans.(d)
Sol.

$$\text{Silt factor (f)} = 1.75\sqrt{dmm}$$
$$f = 1.75\sqrt{0.81}$$
$$\boxed{f = 1.575}$$

S39. Ans.(a)
Sol.
Advantage of canal lining
(i) Seepage reduction
(ii) Prevention of water logging
(iii) Increase in commanded area
(iv) Increase in channel capacity
(v) less maintenance
(vi) safety against flood.

S40. Ans.(d)
Sol. A one dimensional flow is one in which all the flow parameters expressed as function of time and one space coordinate only (say X – direction).

S41. Ans.(c)

Sol. A pitot tube is a device which is used to measure velocity of flow or velocity at a point while differential manometer measure pressure difference between two points.

S42. Ans.(d)

Sol. The properties of stream function are-

→ Ψ is constant everywhere on any stream line.

→ The rate of change of Ψ with distance in an arbitrary direction, is proportional to the component of velocity normal to that direction.

→ The flow around any path in the fluid is zero for continuous flow.

→ The velocity vector may be found by differentiating the stream function.

S43. Ans.(b)

Sol.

Given,

Compressibility $(\beta) = 5 \times 10^{-11}\ Pa^{-1}$

We know,

$$\text{Compressibility } (\beta) = \frac{1}{\text{Bulk Modulus (K)}}$$

$$K = \frac{1}{5 \times 10^{-11}}$$

$$K = 2 \times 10^{10}\ Pa$$

$$\boxed{K = 20\ GPa}$$

S44. Ans.(c)

Sol.

Given,

Weight of liquid (W) = 3000 kg

Volume of liquid (V) = 4 m^3

$$\text{Density of liquid } (\rho) = \frac{W}{V} = \frac{3000}{4} = 750\ kg/m^3$$

$$\text{Specific gravity (G)} = \frac{Density\ of\ liquid\ (\rho)}{Density\ of\ water(\rho_w)}$$

$$= \frac{750}{1000}$$

$$= 0.75$$

S45. Ans.(b)

Sol.

Bulk modulus

$$K = -\frac{\Delta P}{\Delta V/V}$$

$$K = -\left[\frac{0.04 \times [150 - 50]}{0.039 - 0.04}\right] = 4000\ N/cm^2$$

S46. Ans.(d)

Sol. All options are correct, we all are aware already with this fact that sea water contains dissolved salt, dissolved air and some suspended matters which increase its specific weight as compare to pure water.

S47. Ans.(a)

Sol.

There are two conditions

(i) If curvature is convex, r is positive P > P_{sat}

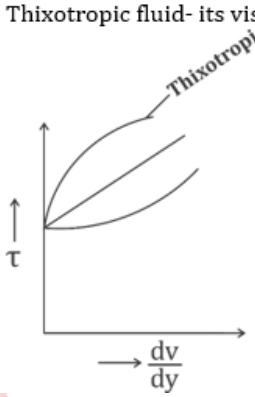
(ii) If curvature is concave, r is negative P< P_{sat}.

S48. Ans.(b)

Sol.

Piezometer is not able to measure pressure below ambient.

Thixotropic fluid- its viscosity decreases with time



S49. Ans.(d)

Sol. Bourdon gauge is most suitable device for this case. It is used to measure medium to high pressure which ranges 0.6 bar to 4000 bar.

S50. Ans.(b)

Sol.

Given, Population = 100,000

Average consumption = 250 lpcd

Average daily draft = 100,000×250

= 25×10^6 l.

= 25 MLD

S51. Ans.(c)

Sol.

Sr.no.	Population	Per capita demand in l/day person
1	Less than 20,000	110
2.	20,000 – 50,000	110-150
3.	50,000 – 2 lakh	150 – 240
4.	2 lakh – 5 lakh	240-275
5.	5 lakh – 10 lakh	275-335
6.	More than 10 lakh	335-360

S52. Ans.(b)

Sol.

Geometric increase method: - in this method the rate of growth of population is assumed to be constant.

$$\boxed{P_n = P_o\left(1 + \frac{r}{100}\right)^n}$$

Where P_n = population after n no. of decades

r = rate of growth

P_o = Initial population

N = no. of decades

S53. Ans.(d)

Sol.

Buston formula for estimating water required for fire demand $Q = 5663\sqrt{P}$

Where Q = l/min.

P = population (in thousands)

S54. Ans.(b)

Sol. As per GOI, the turbidity of water is measured in NTU (Nephelometric turbid unit). The permissible limit of turbidity in in drinking water is 1-10 NTU.

S55. Ans.(b)

Sol. Workability of concrete depends upon water cement ratio and grading of aggregate. As water – cement ratio increases. Workability of concrete is also increased.

S56. Ans.(d)

Sol. The water which is used for concrete should be free from oil, acid, organic matter etc. because it reduces the strength of concrete.

S57. Ans.(c)

Sol.

Given, total quantity of water = Q

Population = P

Time = 1 year

$$\text{Per capita demand of water} = \frac{Q}{P \times 365}$$

S58. Ans.(d)

Sol.

Population	Peak factor
Up to 50,000	3
50,000 to 2 lakh	2.5
More than 2 lakh	2.0

S59. Ans.(a)

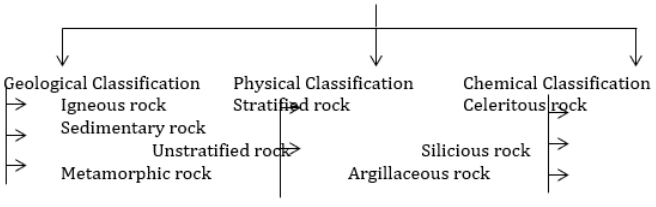
Sol.

Alkanity is defined as the concentration of all ions in the water which are capable to neutralizing the acid. It is determined by titrating the water sample with 0.02N H_2So_4 using phenolphthalein and methyl orange indicators.

S60. Ans.(d)

Sol.

Classification of Rocks



Igneous rock : Formed by cooling and solidification of Magma and Lava.

Ex.: Granite, Trap, Pegmatite, Dolerite, Rhyolite, Basalt.

Sedimentary rock : Formed by weathering action of existing rocks.

Eg.: Sand Stone, Lime Stone, Shale, Gravel, Lignite etc.

Metamorphic rock : Igneous and sedimentary rocks are undergone considerable change with high pressure and temperature.

Eg.: Marble, Quartzite, Slate.

Stratified rock : Rocks which present in layer by layer

Eg.: All sedimentary rock, slate.

Unstratified rock : Does not show any layer.

Eg.: All igneous rock

Foliated rock : They exist in foliation. They have the tendency to split along definite direction.

Eg.: All metamorphic rock.

Calcareous rock : The main constituents are Calcium Carbonate.

Ex.: Marble, Lime Stone.

Siliceous rock : The main constituents are silica.

Eg.: Granite, Trap, Quartz.

Argillaceous rock : They have clay and alumina as their main constituent.

Ex.: Slate, Mud Stone, Laterite

S61. Ans.(c)

Sol. Veneer :

A very thin sheet of wood which is cut from the round logs with 0.5 mm to 5 mm thickness is known as Veneer.

Fine Veneers are made from expansive wood like wallnut, teak wood.

Veneers are used to make plywood, lamination board, Batten boards.

Fiber board :

This is also known as pressed wood

These board are made from wood fiber or agricultural fiber

Thickness of fibre board varies between 3 mm to 12 mm.

Chip board :

These are made up of saw dust, wood chips and synthetic resin or other suitable binder.

These boards are used for partition doors, furniture making etc.

Block board :

Block boards are made up of strip of wood having 25 mm width.

These boards are used for the construction of bus bodies, railway carriage, river craft etc.

These boards are glued to form a slab which is glued between two or more Veneer.

S62. Ans.(c)
Sol.
Surface tension : Surface tension is a phenomenon due to which the exposed liquid behaves like a stretched membrane
- When a liquid is exposed to the air it behaves like a stretched membrane as the water molecule are attracted to each other.

Surface tension $(\sigma) = \frac{\text{Force}}{\text{Length}}$
Unit of surface tension = N/m
- Capillary action is an effect of surface tension that is only applicable to small tube that contain liquids.

S63. Ans.(a)
Sol.
Central Pollution Control Board
→ It is a statutory organisation under the Ministry of Environment, Forest and Climate Change of the Government of India.
→ The CPCB is responsible for monitoring and controlling air and water pollution in the country.
→ It was established in 1974 under the Water (Prevention and Control of Pollution) Act 1974, and later in 1981. It was given additional power under the Air (Prevention and Control of Pollution) Act 1981.

S64. Ans.(c)
Sol.
The fundamental of a building block in estimating construction labour estimate as follows :
i) Project quantities
→ It is defined as the quantity used in the project.
ii) Work hour unit rate per quantity
→ It is a method to estimate the construction cost of quantities completed in one hour.
iii) Crew mix
→ It is the combination of 72% of skilled worker and 28% of unskilled worker.
→ The size depend upon the type of project, the schedule of the project and the amount of work required to completed.
Note :
Project Owner : Project owner is a person responsible for funding the design, construction operation, and maintenance of a trade project or simple project.

S65. Ans.(d)
Sol. Assumption in Terzaghi's one dimensional consolidation theory.
Soil is homogeneous and isotropic.
Coefficient of consolidation is constant.
Secondary compression does not occur.
Soil is completely saturated.
Darcy's law is applicable.
Loading is one dimensional, settlement and flow of water is vertical.

S66. Ans.(d)
Sol.
Simpson's rule :
An arc is assumed to be present between the boundaries of the ordinate. Therefore it is also called parabolic rule.
Total area $= \frac{\text{Common distance}}{\text{d}}$ [(1st ordinate + last ordinate) + 4(Sum of even ordinate) + 2(Sum of odd ordinate)]
- Limitations of Simpson's rule :
→ It is valid for only odd number of ordinate

Note : It gives more accurate result
Addition Information
- **Trapezoidal Rule**

$A = \frac{\text{Common distance}}{2}$ [1st ordinate + last ordinate + 2(Sum of other ordinate)]

S67. Ans.(c)
Sol.
Laminar flow : It is a type of flow in which fluid flow along stream line and fluid travels smoothly or in regular path.
Reynold's number for different type of flow are given as follows :

		Laminar	Transition	Turbulent
(i)	Pipe flow	$R_e < 2000$	$2000 < Re < 4000$	$R_e > 4000$
(ii)	Flow between parallel plates	$R_e < 1000$	$1000 < Re < 2000$	$R_e > 2000$
(iii)	Flow in open channel	$R_e < 500$	$500 < Re < 2000$	$R_e > 2000$
(iv)	Flow through soil	$R_e < 1$	$1 < Re < 2$	$R_e > 2$

S68. Ans.(d)
Sol. Valuation : It is the process of determining the worth value of an asset, investment, business or company.
It is typically used in finance and accounting to determine the fair market value of an asset and can be based on a variety of factors such as current market conditions, financial performance project earnings etc.
The main purpose of valuation are:
For buying and selling of property
Mortgage value or security of loans
It is also required for insurance
For getting loan of property
For rent fixation
To assess the tax of a property
Note: If government building is to be constructed on government land then valuation is not required.

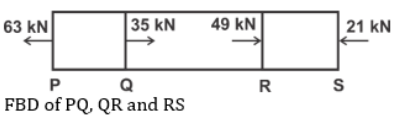
S69. Ans.(d)
Sol.
According to IS 456 : 2000, the expression for equivalent shear stress is given by
$V_e = V_4 + \frac{1.6\,T_u}{b}$
where,
V_e = equivalent shear stress
V_4 = Nominal shear stress
T_u = Torsional moment
b = width of beam

Note:
The equivalent bending moment M_{ed} is given by
$M_{ed} = M_4 + \frac{T_u\left(1+\frac{D}{b}\right)}{1.7}$
where,
M_{ed} = Equivalent Bending moment
T_u = Torsional moment
D = Overall depth of beam
b = width of beam
M_u = Bending moment at cross-section.

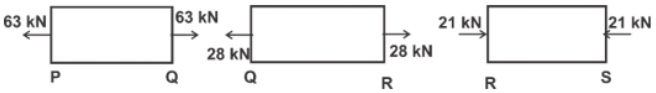
S70. Ans.(d)
Sol. there is no material whose Poisson's ratio is more than unity because maximum value of Poisson's ratio for any material is equal or less than to 0.5.

S71. Ans.(c)
Sol. Percentage reduction of area in performing tensile test on cast iron may be of the order of 0% because cast iron is a brittle material and very week in tension so there is no local yielding takes place.

S72. Ans.(b)
Sol.



FBD of PQ, QR and RS



Stress in QR section
$\sigma = \frac{P}{A} = \frac{28 \times 10^3}{700 \times 10^{-6}} = 40\ MPa$

S73. Ans.(b)

Sol.

extension in will $\delta l = \frac{PL}{AE}$

$\delta l = 1mm$

Now, P' = P , L = 2L, A = $\frac{\pi}{4}(2d)^2, E' = E$

$$\delta l' = \frac{P'L'}{A'E'} = \frac{P.2L}{\frac{\pi}{4}[4d^2] \times E}$$

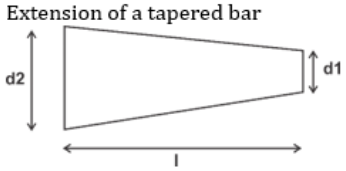
$$= \frac{2}{4} \times \frac{PL}{AE} = \frac{1}{2}\delta l$$

$$= \frac{1}{2} \times 1 = 0.5\ mm$$

S74. Ans.(a)

Sol.

Extension of a tapered bar



$$\boxed{\delta l = \frac{4WL}{\pi d_1 d_2 E}}$$

S75. Ans.(d)

Sol. When ice floating on water in a container melts, the level of water in container remains the same because volume of displaced water is equal to the volume of ice submerged in water and as soon as ice melts the displaced volume is also decreases with submerged ice volume.

S76. Ans.(b)

Sol.

For velocity potential function

Velocity component in x-direction,

$u = \frac{-\partial\phi}{\partial x}$

velocity component in y-direction,

$V = \frac{-\partial\phi}{\partial y}$

S77. Ans.(d)

Sol.

Given:

Stagnation pressure head (h_{st}) = 16 m

Static pressure head (h_s) = 13.5 m

Effective head (h) = $h_{st} - h_s$

= 16 – 13.5

= 2.5 m

We know that,

Velocity of flow (V) = $C_V.\sqrt{2gh}$

= $0.98\sqrt{2 \times 9.81 \times 2.5}$

= 0.98 × 7.0035 = 6.86 m/s

S78. Ans.(b)

Sol.

Given:

Dia of orifice (d_0) = 75 mm

Dia of Vena-contracta (d_V) = 60 mm

Or

Dia of jet

We know that,

Co-efficient of contraction, $C_C = \frac{\text{area of vena–contracta or } Area\ of\ jet}{Area\ of\ orifice}$

$= \frac{\frac{\pi}{4}(60)^2}{\frac{\pi}{4}(75)^2}$

= 0.64

S79. Ans.(d)

Sol.

Momentum correction factor is the ratio of momentum rate based on the actual velocity to the momentum rate based on average velocity. It is denoted by 'β'.

$\beta = \frac{\text{Momentum rate based on the actual velocity}}{\text{Momentum rate based on hte average velocity}}$

The value of momentum correction factor for laminar flow is 1.33.

The value of momentum correction factor for turbulent flow is 1.02-1.05.

S80. Ans.(d)

Sol.

a) **Weir :** It is a low head dam which act as a barrier across the width of a river that alters the flow characteristics of water and usually results in a change in height of river level.

b) **Notch :** It is a device used for measuring the rate of flow of a liquid through a small channel.

- It is an opening provided in the side of tank such that the liquid surface in tank is below the top edge of opening.

c) **Regulator :**

- Discharge can be regulated through regulator.
- The structures constructed at the head of the canal is termed as canal head regulator and its purpose is to control the supplies of water and entry of silt into the off-taking canal.

d) **Orifice :** It is a device which is used for measuring the discharge.

S81. Ans.(c)

Sol. Harappan sites Kalibangan used mud-bricks in ample for the construction of houses.

S82. Ans.(a)

Sol. In 1717, Farrukhsiyar issued a farman giving the British East India Company the right to reside and trade in the Mughal kingdom. They were allowed to trade freely, except for a yearly payment of 3,000 rupees.

S83. Ans.(c)

Sol. INC did not take part in the first Round table Conference. In the First Round Table Conference, Dr. B.R. Ambedkar demanded separate electorates for the depressed classes.

S84. Ans.(b)

Sol. The subsidiary Alliance System was first introduced by the French East India Company Governor Joseph Francois Dupleix. It was later used by British Lord Wellesley who was the Governor-General of India from 1798 to 1805. Early in his governorship, Lord Wellesley adopted a policy of non-intervention in the princely states.

S85. Ans.(b)
Sol.

- La-Nina is a coupled ocean-atmosphere phenomena which is a counterpart of El-Nino. When it occurs, the sea surface temperature across the Pacific Ocean decreases by 3 to 5-degree Celsius than normal.
- It affects the Pacific Ocean by cooling down the temperature of water.

S86. Ans.(d)
Sol.

- The Earth's atmosphere has a series of layers, each with its own unique characteristics.
- Going away from the ground level, these levels are called the troposphere, the stratosphere, the mesosphere, the thermosphere, and the exosphere.

S87. Ans.(a)
Sol. 82°30'E longitude has been selected as the Standard Meridian of India. It passes through Mirzapur (in Uttar Pradesh).
Indian Standard Time Line passes through 5 states - Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Orissa, Andhra Pradesh.

S88. Ans.(b)
Sol. The idea of Directive Principles of State Policy is borrowed from the Irish Constitution of 1937 which interestingly has borrowed itself from the Spanish Constitution.

S89. Ans.(a)
Sol. The 86th Amendment Act 2002, With a view to making right to free and compulsory education a fundamental right, the Act inserts a new Article, namely, Article 21A conferring on all children in the age group of 6 to 14 years the right to free and compulsory education.

S90. Ans.(c)
Sol.

- If any question arises whether a bill is a money bill or not, the decision of the Speaker of the Lok Sabha is final.
- A money bill can only be introduced in the Lok Sabha and that too on the recommendation of the president.
- There is no chance of any disagreement between the two Houses and hence, there is no provision of a joint sitting of both the Houses in this regard.

S91. Ans.(b)
Sol.

- Headquarter - London, United Kingdom
- Amnesty International is a non-governmental organization with its headquarters in London, the United Kingdom focused on human rights.
- It was founded by Peter Benenson.
- It was founded in July 1961.

S92. Ans.(a)
Sol.

- 'Agni Ki Udan' or 'Wings of Fire' book was written by APJ Abdul Kalam.
- APJ Abdul Kalam was born on 15th October 1931 at Rameswaram, Tamil Nadu
- His nickname was 'Missile Man'.
- He was sworn in as India's 11th President in 2002

S93. Ans.(a)
Sol. Prime Minister Narendra Modi inaugurated Mopa International Airport in Goa, which has been named after former Chief Minister Manohar Parrikar.
Details:
The new airport is capable of handling large aircraft such as the Airbus A380.

S94. Ans.(c)
Sol. Prime Minister Narendra Modi announced a new 'Aarogya Maitri' project.
Details:

- Under this India will provide essential medical supplies to any developing country affected by natural disasters or humanitarian crisis and proposed to set up a 'centre of excellence' to facilitate development solutions to these countries.

S95. Ans.(a)
Sol. The Battle of Plassey was a decisive victory of the British East India Company (under commandership of Lord Clive) over the Nawab of Bengal Siraj-ud-dualah and his French allies on 23 June 1757.

S96. Ans.(c)
Sol. Titan is the largest moon (Satellite) of Saturn

- It is the second-largest moon in our Solar System.
- 1stlargest- Jupiter's moon Ganymede.
- Titan is primarily composed of nitrogen with methane and ethane.
- But it lacks in Oxygen.
- It is larger than Mercury.

S97. Ans.(c)
Sol. Panna National Park is a national park located in Panna and Chhatarpur districts of Madhya Pradesh.

S98. Ans.(d)
Sol. Khajuraho dance festival, organized by the Madhya Pradesh Kala Parishad, is a one-week-long festival of classical dances held annually against the spectacular backdrop of the magnificently lit Khajuraho temples in Chhatarpur district of Madhya Pradesh state in central India

S99. Ans.(d)

Sol. The SI unit that is not correctly matched in the given options is:

(d) Pressure - Dyne

The correct SI unit for pressure is the Pascal (Pa), not the Dyne. The Dyne is a unit of force in the centimeter-gram-second (CGS) system, whereas the Pascal is the unit of pressure in the International System of Units (SI).

S100. Ans.(d)

Sol. The chemical formula for quicklime is CaO. Quicklime, also known as calcium oxide, is a white, caustic, alkaline crystalline solid that is commonly used in various industrial applications, such as cement production, water treatment, and as a flux in metallurgy.s

- Ca_2O_3 Calcium peroxide is a compound that releases oxygen when it reacts with water and is commonly used as an oxygen source in various applications.
- Ca_2CO_3: Calcium carbonate is a common compound found in minerals such as limestone, marble, and chalk. It is often used in construction materials, as a dietary supplement, and in the production of cement and lime.