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Q : 1) The curvature of the earth's surface is taken into account if the extent of survey is more than

A: 100 km²

B: 160 km²

C: 500 km²

D: 260 km²

Q : 2) Which of the following scale of the map is not affected due to shrinking of map?

A: Engineer's scale

B: Graphical scale

C: Representative fraction

D: None of these

Q : 3) Indian road congress (IRS) was setup in the year

A: 1950

B: 1978

C: 1956

D: 1934

Q : 4) The ruling principle of surveying is to

A: Work from whole to part

B: Work from part to whole

C: Work from line to area

D: Work from point to area

Q : 5) A method usually adopted to contour rough mountainous region is:

A: Tacheometry

B: Chain and level

C: Plane table

D: Chain and compass

Q : 6) The area of a plan of an old survey plotted on a sheet is found to have shrunk so that a line originally 10 cm long now measures 9.7 cm only. Calculate the shrinkage factor.

A: 0.97

B: 1.03

C: 9.7

D: 97

Q : 7) According to the recommendation of Nagpur conference the width formation of an ideal national highway in hard rock cutting is _____

A: 8.9 m

B: 7.9 m

C: 6.9 m

D: 6.5 m

Q : 8) Heavy foundation stones are not at all necessary to be placed at the bottom layer of road with sub-grade cross slope of 1 in 36. Which of the following methods of construction used this concept?

A: Telford construction

B: Tresaguet construction

C: Macadam construction

D: Metcalf construction

Q :9) What is the maximum super elevation that is fixed by Indian Road Congress (IRC) for roads in plain and rolling terrains and in snowbound areas, taking mixed traffic into consideration?

A: 10.0%

B: 5.5%

C: 4.0%

D: 7.0%

Q : 10) As per IRC, what shall be the maximum length of truck and trailer combination of road vehicle?

A: 12 m

B: 16 m

C: 18 m

D: 11 m

Q : 11) For a hill road with the ruling gradient of 6%, what will be the compensated gradient at a curve of radius 60 m?

A: 5.5%

B: 4.5%

C: 4.75%

D: 5%

Q : 12) A two-lane road with design speed 60 km/h has a horizontal curve of radius 400 m. What will be the super elevation required to be provided for the mixed traffic conditions at the curve as per IRC 38-1998?

A: 8.7%

B: 6.4%

C: 4.0%

D: 7%

Q : 13) The width of carriageway for a two lane road with raised kerbs, as recommended by IRC is:

A: 5.5 m

B: 7.5 m

C: 7.0 m

D: 8.6 m

Q : 14) The area under a hyetograph represents;

A: Total precipitation received in that period

B: Total runoff received in the period

C: Average intensity of the rainfall received in the period

D: Total intensity of rainfall received in the period

Q : 15) Which of the following statements is/are correct?

- 1. Isochrones are curves of equal pore water pressure**
- 2. Isochrones depict the variation of the pore water pressure along the depth of the soil sample**
- 3. Isochrones vary with time**

A: 1 only

B: 2 and 3 only

C: 1 and 2 only

C: 1, 2 and 3

Q : 16) 1 cumec day = ?

A: 0.86 hectare-metres

B: 864 hectare-metres

C: 86.4 hectare-metres

D: 8.64 hectare-metres

Q : 17) Water for irrigation supplied as per crop requirement throughout the crop period/year is called:

A: Drip irrigation

B: Inundation irrigation

C: Lift irrigation

D: Perennial irrigation

Q : 18) Which type of irrigation is practiced when the water supply is at too low a level to run by gravitation of the land?

A: Lift irrigation

B: Flow irrigation

C: Inundation irrigation

D: River canal irrigation

Q : 19) In which of the following types of canal alignment are the cross-drainage works minimized?

A: Watershed canal

B: Valley canal

C: Straight canal

D: Contour canal

Q : 20) The number of hectares of land irrigated for full growth of a given crop by supply of 1 m^3 per second of water continuously during the entire base period of crop is called

A: Duty

B: Kor-watering

C: Delta

D: Crop water

Q : 21) The number of hectares irrigable per cumec of the canal capacity at its head is known as

A: Time factor

B: Nominal duty

C: Capacity factor

D: Full supply coefficient

Q : 22) Which of the following is a plantation type of crop?

A: Sugarcane

B: Fodder

C: Ground nut

D: Tea

Q : 23) Which of the following is correct about annual irrigation intensity?

A: It can be greater than 100%.

B: Minimal value of annual irrigation is desirable.

C: It is the area in percentage of the gross command area irrigated in a season.

D: It is the area in percentage of the cultural command area irrigated in a season.

Q : 24) The property of fluid by virtue of which it offers resistance to shear is called _____

A: Surface tension

B: Adhesion

C: Cohesion

D: Viscosity

Q : 25) The unit of kinematic viscosity is

A: m^2/sec

B: $\text{kg}\cdot\text{sec}/\text{m}^2$

C: $\text{Newton}\cdot\text{sec}/\text{m}^2$

D: $\text{Newton}\cdot\text{sec}^2/\text{m}$

Q : 26) Viscous force is the _____ of shear stress due to viscosity and cross sectional area of flow.

A: Sum

B: Product

C: Difference

D: Ratio

Q : 27) Which of the following parameter is not associated with viscosity

A: Red wood

B: Say bolt

C: Engler

D: Orsat

Q : 28) Which of the following is the unit of kinematic viscosity

A: Pascal

B: Poise

C: Stoke

D: Faraday

Q : 29) The category of fluids in which shear stress is linearly related to the velocity gradient is known as:

A: Ideal

B: Dilatant

C: Newtonian

D: Pseudo plastic

Q : 30) Determine the specific weight of a liquid having specific gravity of 0.85. Take specific weight of water as 10000 N/m^3 . Express the answer in kN/m^3 units.

A: 0.085

B: 85

C: 0.85

D: 8.5

Q : 31) Which one of the following pressure units represents the least pressure?

A: Millibar

B: mm of mercury

C: N/mm^2

D: Kgf/cm^2

Q : 32) “The intensity of pressure at any point in the liquid at rest is same in all the directions”.

This statement is given by _____.

A: Law of conservation of energy

B: Law of conservation of mass

C: Newton’s law

D: Pascal’s law

Q : 33) What is the shear stress of fluid at rest?

A: Unity

B: Zero

C: uniform

D: Unfinity

Q : 34) Pascal's law says that the:

A: Intensity of pressure at a point in a fluid at rest is equal to zero

B: Intensity of pressure at a point in a fluid at rest is equal in magnitude in all directions

C: Intensity of pressure at a point in a fluid at rest cannot be determined

D: Intensity of pressure at a point in a fluid at motion is equal in magnitude in all directions.

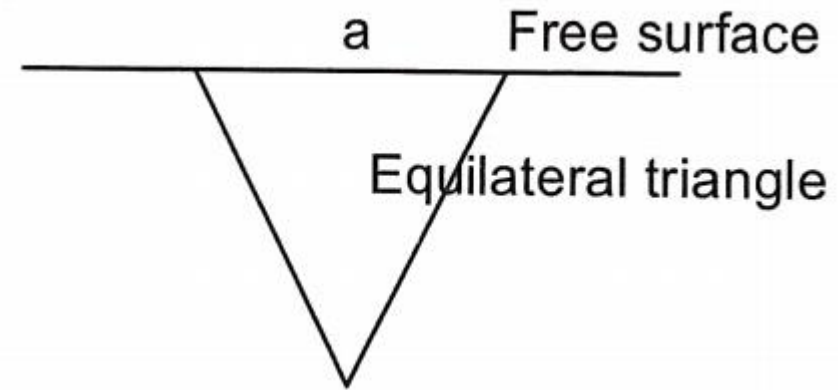
Q : 35) An equilateral triangular plate of side 'a' is immersed in water with one side at free water surface in the given figure. The centre of pressure is below the water surface at a depth of

A: $\frac{\sqrt{3} a}{4}$

B: $\frac{a}{2\sqrt{3}}$

C: $\frac{a}{\sqrt{3}}$

D: $\frac{a}{3}$



Q : 36) A floating body will remain in stable equilibrium if the metacenter is

A: Above the centre of buoyancy.

B: Above the centre of gravity.

C: Below the centre of buoyancy.

D: Below the centre of buoyancy.

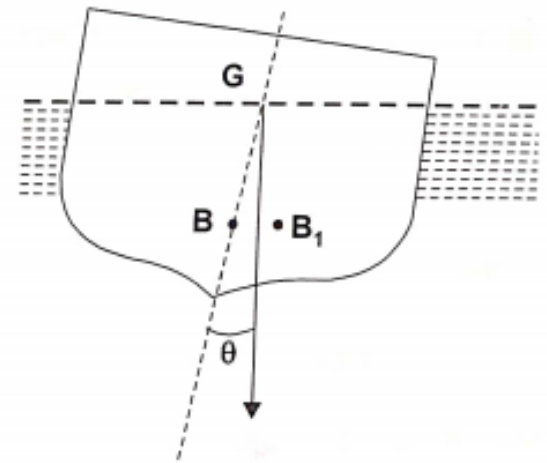
Q : 37) If B = centre of buoyancy, G = centre of gravity, B_1 = new centre of buoyancy when the floating body rotates by an angle θ , then the location of metacentre will be:

A: In between point B and B_1

B: At the point of intersection of axis of floating body passing through B and G and vertical line passing through B_1

C: AT the point of intersection of axis of floating body passing through B and G and horizontal line passing through B_1

D: Same as B_1



Q : 38) The line of action of the buoyant force acts through the centroid of the –

A: submerged body

B: Volume of the floating body

C: Volume of the fluid body

D: Displaced volume of fluid

Q : 39) What is the drive weight and height of free fall in the case of standard penetration test according to IS 2131-1981?

A: 63.5 kg and 60 cm

B: 63.5 kg and 75 cm

C: 65 kg and 60 cm

D: 60 kg and 70 cm

Q : 40) Select the INCORRECT statement from the following with regard to grillage footing in steel structure.

A: It consists of steel beams encased in concrete.

B: It is provided when the loads on the column is extremely heavy.

C: The bearing capacity of soils should be very high to place grillage foundation.

D: The column is placed over base plate.

Q : 41) In a rigid footing on a cohesive soil, the contact pressure distribution is:

A: Uniform

B: Non-uniform, with maximum at the centre and minimum at the end

C: Non-uniform, with maximum at the ends

C: Non-uniform, with maximum at the ends and minimum at the centre

D: Linear

Q : 42) A retaining wall with vertical back retains a mass of cohesion less soil, surface of which is level with top of the wall. Active lateral earth pressure coefficient (in terms of ϕ) i.e. angle of internal friction of backfill is given by:

A: $\frac{1 - \sin \phi}{1 + \sin \phi}$ or $\tan^2 \left(45^\circ + \frac{\phi}{2} \right)$

B: $\frac{1 + \sin \phi}{1 - \sin \phi}$ or $\tan^2 \left(45^\circ - \frac{\phi}{2} \right)$

C: $\frac{1 - \sin \phi}{1 + \sin \phi}$ or $\tan^2 \left(45^\circ - \frac{\phi}{2} \right)$

D: $\frac{1 + \sin \phi}{1 - \sin \phi}$ or $\tan^2 \left(45^\circ + \frac{\phi}{2} \right)$

Q : 43) An excavation is to be made in a saturated soft clay ($\phi_u = 0$) with vertical sides. What will be the maximum unsupported depth of the vertical cut?

Given that cohesion intercept = 30 kN/m^2 , unit weight of clay = 15 kN/m^3

A: 5 m

B: 8 m

C: 6 m

D: 4 m

Q : 44) The shear strength in plastic undrained clay, is due to

A: Inter-granular friction

B: Internal friction

C: Cohesion

D: None of these

Q : 45) The strength of the soil mainly described by

A: Tensile strength

B: Torsional strength

C: Shear strength

D: Compressive strength

Q : 46) If the angle of internal friction (ϕ) = 30° for a soil, the angle of failure plane relative to the major principle plane in a triaxial test will be:

A: 60°

B: 30°

C: 45°

D: 67.6°

Q : 47) A shear box test was performed to give the following results for a cohesive soil sample.

Results:	(1)	(2)
Normal stress σ (kN/m ²)	150	250
Shear stress at failure T (kN/m ²)	110	120

The value of C and ϕ are :

A: $\tan \phi = 1.2$ and $c = 108$ kN/m²

B: $\tan \phi = 1.0$ and $c = 108$ kN/m²

C: $\tan \phi = 0.1$ and $c = 95$ kN/m²

D: $\tan \phi = 0.8$ and $c = 70$ kN/m²

Q : 48) Which of the following is a method used in a field to determine the permeability of soil?

A: Pumping out of well method

B: Oedometer test

C: Constant head permeameter method

D: Falling head permeameter method

Q : 49) Which of the following factors does NOT affect permeability of soil?

A: Properties of pore fluid

B: Grain size of soil particles

C: Void ratio

D: Volume of soil

Q : 50) Consider different types of soils i.e. fine sand (F), Homogeneous clay (C), coarse gravel (G), silty clays (S). Arrange the soils in the increasing order of their permeability (low to high values).

A: C, F, S, G

B: S, C, F, G

C: C, S, F, G

D: S, C, G, F

Q : 51) If the void ratio and discharge velocity for soil is 0.5 and 6×10^{-7} m/s respectively, what is the value of seepage velocity (m/s)?

A: 3×10^{-7}

B: 6×10^{-7}

C: 12×10^{-7}

D: 18×10^{-7}

Q : 52) Which of the following statements are true about quicksand?

- i. If is only a condition but not a type of sand.**
- ii. It is a condition and a type of sand too.**
- iii. Quicksand condition reaches when critical hydraulic gradient is approximately equal to unity.**
- iv. Quicksand condition occurs more commonly in coarse grained sand or gravels than fine sand.**

A: Both statements ii and iii are true

B: Statements I, iii and iv are true

C: Statements I, iii and iv are true

D: Both statements I and iii are true

Q : 53) According to Terzaghi and peck the ratio of D15 size of filter material to the D85 size of the base material should be:

A: < 10

B: < 15

C: < 4

D: < 25

Q : 54) The amount of standard solution required to obtain a permanent lather with a water sample of known volume with constant shaking determines the total hardness in:

- A: Dr. Clark's process**
- B: Hehner's process**
- C: William's process**
- D: Durkheim's process**

Q : 55) What is the surface area (m^2) of settling tank used for design discharge of $1.5 \text{ m}^3/\text{s}$? (Assume depth overflow rate for tank as $40 \text{ m}^3/\text{m}^2/\text{day}$)

A: 2045.32

B: 3240.44

C: 4525.33

D: 5076.13

Q : 56) Which of the following is an objective of aeration of water?

- A: To decrease the dissolved oxygen content of the water**
- B: To remove tastes and odours from the gases produced due to organic decomposition**
- C: To increase the carbon dioxide content of water**
- D: To preserve hydrogen sulphide**

Q : 57) Which of the following is NOT used as a coagulant?

A: Copperas

B: Sodium carbonate

C: Alum

D: Ferric chloride

Q : 58) The processes of adding chemicals to induce aggregation and settling of finely divided suspended matter, colloidal substances etc. In water treatment plants is called

A: Filtration

B: Clarification

C: Aeration

D: Plain sedimentation

Q : 59) 24,00,000 litres of water passes through a sedimentation tank which has 300 cubic meter volume per day. The detention time for tank is

A: 1.25 hours

B: 3 hours

C: 8 hours

D: 0.875 hours

Q : 60) What is the main reason for pH control during disinfection?

A: To inhibit the reaction of chlorine with water

B: To ensure that powerful residual hypochlorous acid (HOCl) is formed

C: To ensure a good water pH in the distribution system

D: To ensure only HCl is formed

Q : 61) The different processes underwater treatment are given under List-1, and the purpose of treatment process is given under List-2.

Match the items in List-1 with those under List-2 using the codes in lists.

A: C-2, D-1, E-3, F-4

B: C-3, D-4, E-2, F-1

C: C-3, D-2, E-1, F-4

D: C-4, D-3, E-1, F-2

List-1	List-2
C. Filtration	1. Disinfection
D. Aeration	2. Removal of calcium and magnesium cations
E. Zeolite process	3. Removal of suspended impurities
F. Ozone treatment	4. Process converts iron and manganese from their soluble state to insoluble state.

Q : 62) Permanent hardness of water is removed by all the following methods, EXCEPT the

A: Zeolite process

B: Lime-soda process

C: Deionation process

D: Boiling process

Q : 63) Which of the following is NOT a dechlorinating agent?

A: Sulphur dioxide

B: Sodium sulphite

C: Carbon dioxide

D: Sodium bisulphite

Q : 64) The following document contains detailed description of all items of work excluding their quantities along with the current rates:

A: Analysis of rates

B: Tender document

C: Abstract estimate

D: Schedule of rate

Q : 65) Thickness of plastering is usually:

A: 40 mm

B: 6 mm

C: 12 mm

D: 25 mm

Q : 66) Using straight line method annual depreciation D is equal to:

- A:** $\frac{\text{Life in year} - \text{Scrap value}}{\text{Original cost}}$
- B:** $\frac{\text{Scrap value} - \text{life in year}}{\text{Original cost}}$
- C:** $\frac{\text{Original cost} - \text{Life in year}}{\text{Scrap value}}$
- D:** $\frac{\text{Original cost} - \text{Scrap value}}{\text{Lufe in year}}$

Q : 67) One brick thickness of wall is roughly equal to

A: 10 cm

B: 15 cm

C: 20 cm

D: 30 cm

Q : 68) The expected out turn of 2.5 cm cement concrete floor per mason per day.

A: 2.5 square meter

B: 5.0 square metre

C: 7.5 square metre

D: 10 square metre

Q : 69) Pick up the term of work not included in the plinth area estimate

A: Wall thickness

B: Room area

C: Verandah area

D: Courtyard area

Q : 70) Which of the following is a dummy activity?

A: Excavate the foundations

B: Waiting for the arrival of concrete materials

C: Lay the foundation concrete

D: Cure the foundation concrete

Q : 71) The covered area of a proposed building is 150 m^2 and it includes a rear courtyard of $5 \text{ m} \times 4 \text{ m}$. If the prevailing plinth area rate for similar building is Rs $1250/\text{m}^2$, what is its cost (in Rs)?

A: 187500

B: 212500

C: 162500

D: 375000

Q : 72) Calculate the cost (Rs.) of 100 mm thick brick lining of a septic tank of size $5\text{m} \times 3\text{m} \times 1.5\text{m}$, If the rate of lining of Rs. 200 per square metre.

A: 4500

B: 4800

C: 5400

D: 7800

Q : 73) For estimation of painted area of semi corrugated asbestos cement sheets, percentage increase in area above plain area is _____.

- A: 0.1**
- B: 0.14**
- C: 0.2**
- D: 0.25**

Q : 74) Which of the following rock is an igneous rock?

A: Limestone

B: Marble

C: Rhyolite

D: Gneiss

Q : 75) Which of the following is an example of stratified rocks?

A: Igneous rock

B: Burned clay brick

C: Metamorphic rock

D: Sedimentary rock

Q : 76) What must be the height of a cylindrical sample for split tensile strength test of stone, if the diameter is 50 mm?

A: 100 mm

B: 60 mm

C: 50 mm

D: 80 mm

Q : 77) The amount of calcium carbonate in lime stone is determined by which of the following tests?

A: Heat test

B: Ball test

C: Acid test

D: Compressive strength test

Q : 78) The approximate volume of stone required for 100 m³ of rubble stone masonry will be:

A: 150 m³

B: 175 m³

C: 125 m³

D: 200 m³

Q : 79) The shape of idealized stress-strain curve for concrete as prescribed by IS 456-2000 is

A: Rectangular

B: Parabolic

C: Rectangular-parabolic

D: None of these

Q : 80) Percentage of steel for balanced design of a singly reinforced rectangular section by limit state method depends on

A: Characteristic strength of concrete

B: Yield strength of steel

C: Modulus of elasticity of steel

D: Geometry of the section

Q : 81) According to IS 456, the number of grades of standard concrete mixes are

A: 3

B: 5

C: 6

D: 7

Q : 82) Building codes require the partition load to be considered even without partition if live load is less than-:

A: 60 psf

B: 70 psf

C: 80 psf

D: 90 psf

Q : 83) M15 concrete is used for:

A: Dams

B: Foundation

C: RCC

D: Mass concreting works

Q : 84) RCC was developed and first used by:

A: Joseph monier

B: John Smeaton

C: Francois coignet

D: Josheph asphadin

Q : 85) Rise of a jack arch is kept about

A: $1/2$ to $1/3$ of the span

B: $1/3$ to $1/4$ of the span

C: $1/4$ to $1/8$ of the span

D: $1/8$ to $1/12$ of the span

Q : 86) The limiting depth of neutral axis for a reinforced concrete beam if size 250 mm in width and 550 mm in depth, with effective cover of 50 mm for reinforcement, using Fe 500 steel is:

A: 230 mm

B: 265 mm

C: 210 mm

D: 240 mm

Q : 87) For concrete works in sea water or exposed directly along the sea coast, the minimum grade of concrete recommended by IS 456:2000, for plain concrete and reinforced concrete are, respectively:

A: M10 and M20

B: M20 and M30

C: M15 and M25

D: M25 and M40

Q : 88) Which of the following methods aim for a comprehensive and rational solution to the design of reinforced cement concrete structure, by considering safety at ultimate loads and serviceability at working load?

- A: Limit state method**
- B: Working stress method**
- C: Direct design method**
- D: Ultimate load method**

Q : 89) Proof resilience is the maximum energy stored at:

A: Limit of proportionality

B: Elastic limit

C: Plastic limit

D: None of these

Q : 90) If 'P' is the tensile stress in a rectangular bar of length 'L' with 'b' and thickness 'd', the volumetric strain is given as:

A: $P(1 + 2\mu)/E$

B: $PL(1 - 2\mu)/bd$

C: $P(1 - 2\mu)$

D: $P(1 - 2)/E$

Q : 91) If a uniform bar is supported at one end in a vertical direction and loaded at the bottom end by a load equal to the weight of the bar, the strain energy as compared to that due to self weight will be:

A: Same

B: Half

C: Twice

D: Thrice

Q : 92) For a beam carrying a uniformly distributed load, the strain energy will be maximum in case the beam is:

A: Propped cantilever

B: Fixed at both ends

C: Cantilever

D: Simply supported

Q : 93) The property of a material by which it can be beaten or rolled into plates, is called:

A: Malleability

B: Ductility

C: Plasticity

D: Elasticity



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