UPPSC-AE
Main Exam 2024

Uttar Pradesh
Public Service Commission

Assistant Engineer

CIVIL ENGINEERING
Paper-II

Questions & Answer Key

Exam held on 28-9-2025

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Q.1 Match the following books with their respective authors:

Books	Authors
A. Diyasalai	i. Sanjeev
B. Naukar ki Kameez	ii. Vinod Kumar Shukla
C. Chhaunk	iii. Kailash Satyarthi
D. Mujhe Pahachano	iv. Abhijit Banerjee

(a) A-iv, B-iii, C-ii, D-i
(b) A-ii, B-i, C-iii, D-iv
(c) A-iii, B-ii, C-iv, D-i
(d) A-i, B-iii, C-ii, D-iv

Ans. (c)

End of Solution

Q.2 **Statement 1:** The Atal Pension Yojana was launched on 1st June, 2017.
Statement 2: All account holders of the age group of 18 - 40 years are eligible for it.
(a) Statement 1 is incorrect and statement 2 is correct.
(b) Both statements are incorrect.
(c) Statement 1 is correct and statement 2 is incorrect.
(d) Both statements are correct.

Ans. (a)

End of Solution

Q.3 The decision to suspend the Indus Water Treaty was taken in the Cabinet Committee on Security (CCS) meeting held after the Pahalgam terrorist attack. In which year was this treaty signed with Pakistan?
(a) 1963
(b) 1962
(c) 1961
(d) 1960

Ans. (d)

End of Solution

Q.4 Abhinav Bindra won the gold medal in the Beijing Olympic Games in:
(a) Wrestling
(b) 10 m Air Rifle
(c) Athletics
(d) Swimming

Ans. (b)

End of Solution

Q.5 Who joined as the 11th Chairman of Securities and Exchange Board of India (SEBI) in March 2025?
(a) Tuhin Kanta Pandey
(b) Madhabi Puri Buch
(c) Ajay Tyagi
(d) Ajay Seth

Ans. (a)

End of Solution

Q.6 Match the List I with List II and choose the correct answer using the codes given below the lists:

List I (State)	List II (National Park)
A. Maharashtra	i. Similipal
B. Odisha	ii. Melghat
C. Bihar	iii. Kalakkad
D. Tamil Nadu	iv. Valmiki

Codes:

(a) A-ii, B-i, C-iv, D-iii
(b) A-ii, B-iv, C-i, D-iii
(c) A-iii, B-iv, C-i, D-ii
(d) A-iii, B-ii, C-iv, D-i

Ans. (a)

End of Solution

Q.7 Who first introduced the concept of 'Megalopolis' in the context of urban geography?

(a) Homer Hoyt
(b) August Lösch
(c) Walter Christaller
(d) Jean Gottmann

Ans. (d)

End of Solution

Q.8 What is the main occupation of people engaged in primary activities?

(a) Services
(b) Manufacturing
(c) Banking
(d) Agriculture

Ans. (d)

End of Solution

Q.9 In which Article is the provision for a separate Public Service Commission for States mentioned?

(a) Article 315
(b) Article 319
(c) Article 316
(d) Article 313

Ans. (a)

End of Solution

Q.10 Which one of the following pairs is ***not*** correctly matched?

(a) Horticulture – Apple
(b) Shifting Agriculture – Jhumming
(c) Plantation Agriculture – Rubber
(d) Sericulture – Rice

Ans. (d)

End of Solution

Q.11 In which year was the Wildlife Protection Act passed in India?

(a) 1972 (b) 1986
(c) 1965 (d) 1952

Ans. (a)

End of Solution

Q.12 Where was the capital of the ancient Vijayanagara Empire?

(a) Warangal (b) Dwarasamudra
(c) Hampi (d) Kanchi

Ans. (c)

End of Solution

Q.13 Match List-I with List-II and select the correct answer using the codes given below the lists:

List-I (Historian)	List-II (Nature of the Revolt of 1857)
A. Sir John Lawrence and Seeley	i. Rashtriya Vidroh
B. Benjamin Disraeli	ii. Sainik Vidroh
C. Veer Savarkar	iii. A conflict between civilization and barbarism
D. T.R. Holmes	iv. Planned war of National Independence

Codes:

(a) A-ii, B-i, C-iv, D-iii (b) A-i, B-ii, C-iii, D-iv
(c) A-iv, B-iii, C-ii, D-i (d) A-ii, B-iv, C-i, D-iii

Ans. (a)

End of Solution

Q.14 Who was the founder of the 'Tattvabodhini Sabha'?

(a) Ishwar Chandra Vidyasagar
(b) Raja Rammohan Roy
(c) Keshab Chandra Sen
(d) Debendranath Tagore

Ans. (d)

End of Solution

Q.15 Which one of the following conditions is most favourable for converting gas into liquid?

(a) Low pressure, high temperature
(b) High pressure, high temperature
(c) Low pressure, low temperature
(d) High pressure, low temperature

Ans. (d)

End of Solution

Q.16 Which of the following pairs is not correctly matched?

(a) No net movement of water across the cell membrane – Isotonic solution
(b) Movement of water across the cell membrane – Osmosis
(c) Carbon dioxide moves across the cell membrane – Osmosis
(d) Movement of oxygen across the cell membrane – Diffusion

Ans. (c)

End of Solution

Q.17 Cell theory was presented by:

(a) Robert Brown
(b) Schleiden and Schwann
(c) Virchow
(d) Leeuwenhoek

Ans. (b)

End of Solution

Q.18 The arrangement of flowers on the floral axis is termed as:

(a) Inflorescence
(b) Phyllotaxy
(c) Floral diagram
(d) Aestivation

Ans. (a)

End of Solution

Q.19 Given below are two statements, one is labelled as Assertion (A) and the other as Reason (R):

Assertion (A): The sun is visible to us about two minutes before the actual sunrise.

Reason (R): Atmospheric refraction takes place.

Select the correct answer using the options given below:

(a) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(b) (A) is true, but (R) is false.
(c) (A) is false, but (R) is true.
(d) Both (A) and (R) are true and (R) is the correct explanation of (A).

Ans. (d)

End of Solution

Q.20 From which country's Constitution did India borrow the nomination of members to the Rajya Sabha and the method of election of the President?

(a) Canadian Constitution
(b) British Constitution
(c) Irish Constitution
(d) Constitution of the United States

Ans. (c)

End of Solution

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Q.21 Which Schedule of the Constitution deals with the division of powers between the Union and States?

(a) Fifth Schedule
(b) Tenth Schedule
(c) Ninth Schedule
(d) Seventh Schedule

Ans. (d)

End of Solution

Q.22 Where was the Theosophical Society established?

(a) Paris
(b) New York
(c) London
(d) Berlin

Ans. (b)

End of Solution

Q.23 Given below are two statements, one is labelled as Assertion (A) and the other as Reason (R):

Assertion (A): The Bombay Association was established on 26th August, 1852.

Reason (R): The Bombay Association supported the Revolt of 1857.

Select the correct answer using the options given below:

(a) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(b) (A) is true, but (R) is false.
(c) Both (A) and (R) are true and (R) is the correct explanation of (A).
(d) (A) is false, but (R) is true.

Ans. (b)

End of Solution

Q.24 When was the Poona Pact signed?

(a) 25th December, 1932
(b) 30th September, 1932
(c) 24th September, 1932
(d) 10th December, 1932

Ans. (c)

End of Solution

Q.25 Who was the founder of the Chola Empire?

(a) Vikrama Chola
(b) Rajendra I
(c) Vijayalaya
(d) Rajaraja

Ans. (c)

End of Solution

Q.26 In a shunting signal, if the red band of the disc is in a horizontal position, it indicates:
(a) Proceed cautiously (b) Proceed
(c) Stop (d) None of the above

Ans. (c)

End of Solution

Q.27 If the average centre-to-centre spacing of vehicles is 30 m, then the basic capacity of the traffic lane at a speed of 60 kmph is:
(a) 2000 vehicles per hour (b) 2000 vehicles per day
(c) 2500 vehicles per hour (d) 2500 vehicles per day

Ans. (a)

End of Solution

Q.28 On a BG 3° curve, for a speed of 70 kmph, the equivalent Cant will be:
(a) 12.50 cm (b) 10.50 cm
(c) 22.50 cm (d) 11.25 cm

Ans. (d)

End of Solution

Q.29 In a vertical curve, an upgrade of 2% is followed by a downgrade of 2%. The rate of change of grade is 0.05% per 20 m chain. The length of vertical curve will be:
(a) 600 m (b) 1200 m
(c) 1000 m (d) 1600 m

Ans. (d)

End of Solution

Q.30 The standard penetration of VG-40 grade bitumen as stipulated by the Indian Standard IS 73 : 2013, is minimum:
(a) 35 (b) 60
(c) 45 (d) 80

Ans. (a)

End of Solution

Q.31 Equivalent factor of Passenger Car Unit (PCU) for a passenger car as per IRC is:
(a) 1.0 (b) 0.5
(c) 2.0 (d) 10

Ans. (a)

End of Solution

Q.32 The most efficient traffic signal system is:

(a) Flexible progressive system
(b) Simultaneous system
(c) Alternate system
(d) Simple progressive system

Ans. (a)

End of Solution

Q.33 The symbol  stands for:

(a) Stop
(b) Right turn prohibited
(c) No parking
(d) No stopping

Ans. (c)

End of Solution

Q.34 A road sign which indicates 'No Parking' sign is called:

(a) Informatory sign
(b) Cautionary sign
(c) Warning sign
(d) Mandatory sign

Ans. (d)

End of Solution

Q.35 A scissor crossover between two parallel railway tracks contains:

(a) A triangular crossover
(b) A turntable device
(c) A rectangular crossover
(d) A diamond crossover

Ans. (d)

End of Solution

Q.36 The most suitable material for highway embankments is:

(a) Silt
(b) Clay
(c) Granular soil
(d) Organic soil

Ans. (c)

End of Solution

Q.37 The number of vehicles using the road per hour during peak periods and the average of several peak days is called:

(a) Traffic rate
(b) Average peak hour volume
(c) Traffic plan
(d) Traffic volume

Ans. (b)

End of Solution

Q.38 Which of the following shapes is preferred in a valley curve?

(a) Spiral (b) Cubic parabola
(c) Lemniscate (d) Simple parabola

Ans. (b)

End of Solution

Q.39 At a certain station, the mean of the average daily temperature is 25°C and mean of the maximum daily temperature is 40°C. What is the airport reference temperature (ART)?

(a) 25°C (b) 35°C
(c) 20°C (d) 30°C

Ans. (d)

End of Solution

Q.40 Residual chlorine can be determined by:

(a) Schick test (b) Orthotolidine test
(c) Oxidate test (d) Mohr's argentometric method

Ans. (b)

End of Solution

Q.41 Global warming is mainly caused by:

(a) O_2 (b) SO_X
(c) CO_2 (d) NO_X

Ans. (c)

End of Solution

Q.42 A broad gauge (BG) track is laid with a sleeper density (M + 3). The width of the sleeper is 20.25 cm. Find the minimum depth of the ballast cushion, if the length of one rail is 13 m.

(a) 20.5 cm (b) 30.5 cm
(c) 61 cm (d) 50.75 cm

Ans. (b)

End of Solution

Q.43 What is the Theoretical Oxygen Demand (ThOD) in mg/L of a glucose solution of concentration 500 mg/L?

(a) 650.21 (b) 533.33
(c) 633.33 (d) 380.65

Ans. (b)

End of Solution

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Q.44 The number of filter units required for a sewage flow of 16 MLD are:

(a) 5 (b) 4

(c) 3 (d) 6

Ans. (a)

End of Solution

Q.45 The chemical formula of coagulant Copperas is:

(a) $Al_2(SO_4)_3 \cdot 18H_2O$ (b) $Na_2 \cdot Al_2 \cdot O_4$

(c) $2Fe_2(SO_4)_3 + 2FeCl_3$ (d) $FeSO_4 \cdot 7H_2O$

Ans. (d)

End of Solution

Q.46 A sedimentation tank of 400 m^3 capacity contains water with a suspended solid concentration of 1000 mg/L. The amount of suspended solids in the tank is:

(a) 400 kg (b) 500 kg

(c) 250 kg (d) 600 kg

Ans. (a)

End of Solution

Q.47 Consider the following statements:

1. Avoid building up of sewer gases.
2. Ensure atmospheric pressure in the wastewater surface.
3. Ensure the safety of sewer maintenance people.
4. Provide oxidation facility to sewage.

Which of the above statements are correct?

(a) 1, 3 and 4 (b) 2, 3 and 4

(c) 1, 2 and 3 (d) 1, 2 and 4

Ans. (c)

End of Solution

Q.48 According to Brune's curve, trap efficiency increases with:

(a) Increase in outflow (b) Increase in sediment flow

(c) Increase in capacity-inflow ratio (d) Increase in rainfall intensity

Ans. (c)

End of Solution

Q.49 If the area of the catchment is 62.5 m^2 and length of the catchment is 10 m, the form factor will be:

(a) 0.50 (b) 1

(c) 0.25 (d) 0.625

Ans. (d)

End of Solution

Q.50 In case of non-availability of space due to topography, the most suitable spillway is:

(a) Shaft spillway (b) Chute spillway

(c) Straight drop spillway (d) Ogee spillway

Ans. (a)

End of Solution

Q.51 A river which dries up completely before joining another river or ocean is known as:

(a) Flood river (b) Flashy river

(c) Tidal river (d) Virgin river

Ans. (d)

End of Solution

Q.52 Which of the following velocity components represent the irrotational flow?

(a) $u = x^2 + y^2 - 2xy$ (b) $u = -6xy,\ v = (y^2 - 3x^2)$

(c) $u = (2x + 3y),\ v = (-2y^2 + x)$ (d) $u = (x + y)^2,\ v = (2x - y)$

Ans. (b)

End of Solution

Q.53 A natural river is conveying a flow of 2500 cumec. What is the expected wetted perimeter of the river cross-section?

(a) 237.5 m (b) 2375.0 m

(c) 327.5 m (d) 137.5 m

Ans. (a)

End of Solution

Q.54 The strength of a hydraulic jump is governed by the:

(a) Bed slope (b) Upstream Froude Number

(c) Downstream velocity (d) Upstream velocity

Ans. (b)

End of Solution

Q.55 The shape of the drawdown curve in an unconfined aquifer is:
(a) Linear
(b) Fourth degree curve
(c) Cubical
(d) Parabolic

Ans. (d)

End of Solution

Q.56 The energy dissipation in a Sarda canal fall is caused by:
(a) Hydraulic jump
(b) Baffle block
(c) Water pool
(d) Friction block

Ans. (c)

End of Solution

Q.57 In the Penman equation, which meteorological parameter is not directly used?
(a) Wind speed
(b) Relative humidity
(c) Psychrometric constant
(d) Net radiation

Ans. (d)

End of Solution

Q.58 If the intensity of irrigation for Kharif crop is 50% and that for Rabi crop is 65%, then the annual intensity of irrigation will be:
(a) 50%
(b) 65%
(c) 85%
(d) 115%

Ans. (d)

End of Solution

Q.59 In a meandering river reach, the deepest river portion will be:
(a) At the inner edge
(b) At some distance from the middle
(c) In the middle
(d) At the outer edge

Ans. (d)

End of Solution

Q.60 For the measurement of evaporation using a pan, the pan coefficient (K) is:
(a) < 1
(b) $= 0$
(c) $= 1$
(d) > 1

Ans. (a)

End of Solution

Q.61 The mean temperature of the Sun's surface is 6000 K and λ_m of its radiation is 0.5 μm. What is the mean temperature of Earth's surface for which λ_m is 10 μm, according to Wein's Displacement Law in the remote sensing concept ?

(a) 28°C (b) 30°C
(c) 25°C (d) 27°C

Ans. (d)

End of Solution

Q.62 The ability of remote sensing system to describe the smallest dimension on the Earth's surface is called:

(a) Spatial resolution (b) Radiometric resolution
(c) Spectral resolution (d) Temporal resolution

Ans. (a)

End of Solution

Q.63 Level surface in levelling is a :

(a) Horizontal surface (b) Vertical surface
(c) Datum surface (d) Curved surface

Ans. (d)

End of Solution

Q.64 When you transit the telescope, you rotate the telescope about which line ?

(a) The trunnion axis (b) The line of collimation
(c) The optical axis of telescope (d) The vertical axis

Ans. (a)

End of Solution

Q.65 The wavelength of visible region in electromagnetic spectrum is :

(a) 0.4 – 0.7 μm (b) 0.03 – 0.4 μm
(c) 1.1 – 3.0 μm (d) 0.7 – 1.1 μm

Ans. (a)

End of Solution

Q.66 If the chainage of point of tangency of a circular curve for a normal chord of 20 m is 2303.39 m, then the length of the last sub-chord will be :

(a) 23.39 m (b) 46.78 m
(c) 3.39 m (d) 16.61 m

Ans. (c)

End of Solution

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Q.67 In which method of irrigation is the entire field divided into number of levelled plots surrounded by levees?

(a) Basin method
(b) Border strip method
(c) Check method
(d) Furrow method

Ans. (c)

End of Solution

Q.68 Which of the following is a semi-modular canal outlet?

(a) Pipe outlet discharging freely in the atmosphere
(b) Masonry sluices
(c) Gibbs' rigid module
(d) Submerged pipe outlet

Ans. (a)

End of Solution

Q.69 Gravity dam is most suitable when the foundation:

(a) Weak
(b) With heavy overburden
(c) Strong
(d) None of the above

Ans. (c)

End of Solution

Q.70 In a super passage, the Full Supply Level (FSL) of the canal is:

(a) Level with the drainage trough
(b) Lower than the underside of the trough carrying drainage water
(c) Above the bed level of the drainage trough
(d) None of the above

Ans. (b)

End of Solution

Q.71 The ratio of the rate of change of discharge of an outlet, to the rate of change of discharge of the distributing channel, is termed as:

(a) Sensitivity
(b) Proportionality
(c) Flexibility
(d) Efficiency

Ans. (c)

End of Solution

Q.72 The maximum height of a masonry dam of a triangular section, whose base width is 'b' and specific gravity is 'S' will be:

(a) $b\sqrt{S}$ (b) $2S\sqrt{b}$

(c) $\sqrt{bS}$ (d) bS

Ans. (a)

End of Solution

Q.73 Centrifugal pump works on the principle of:

(a) Bernoulli's principle (b) Forced vortex flow

(c) Newton's second law (d) Pascal's law

Ans. (b)

End of Solution

Q.74 The flow will be in supercritical state in the following profile:

(a) M_3, S_3 and M_1 (b) S_1, S_2 and S_3

(c) S_2, S_3 and M_3 (d) M_2, S_1 and M_3

Ans. (c)

End of Solution

Q.75 In Borda's mouthpiece, the coefficient of contraction is:

(a) 0.50 (b) 0.55

(c) 0.707 (d) 0.60

Ans. (a)

End of Solution

Q.76 In a tidal model, the horizontal scale ratio is 1/500 and the vertical scale ratio is 1/100. The model period corresponding to a prototype period of 12 hours will be:

(a) 1.2 hours (b) 0.48 hour

(c) 6 hours (d) 0.24 hour

Ans. (d)

End of Solution

Q.77 The shear stress in Newtonian fluid is proportional to:

(a) Pressure (b) The inverse of the viscosity

(c) Strain rate (d) Strain

Ans. (c)

End of Solution

Q.78 In a laminar flow between two fixed parallel plates, the shear stress is:
(a) Constant across the passage
(b) Maximum at the boundary and zero at the centre
(c) Zero all through the passage
(d) Maximum at the centre and zero at the boundary

Ans. (b)

End of Solution

Q.79 A negative reading in the levelling data means, the staff is:
(a) Read with the lower crosshair
(b) Read through the objective lens
(c) Kept upside down
(d) Read upside down

Ans. (c)

End of Solution

Q.80 Select the incorrect statement:
(a) The direction of steepest slope is along the longest distance between the contours.
(b) Two contour lines intersect in the case of a vertical cliff.
(c) Steepest slope of watershed crosses the contours at right angles.
(d) In the direct method of contouring, the contours are not interpolated.

Ans. (a)

End of Solution

Q.81 The principle of plane table survey is:
(a) Parallelism
(b) Traversing
(c) Ranging
(d) Triangulation

Ans. (a)

End of Solution

Q.82 Solving the three-point problem using trial and error method, the strength of fix is good, when the station occupied by the plane table lies:
(a) Near the circle passing through the three points
(b) On the circle passing through the three points
(c) Within the triangle formed by the three points
(d) None of the above

Ans. (c)

End of Solution

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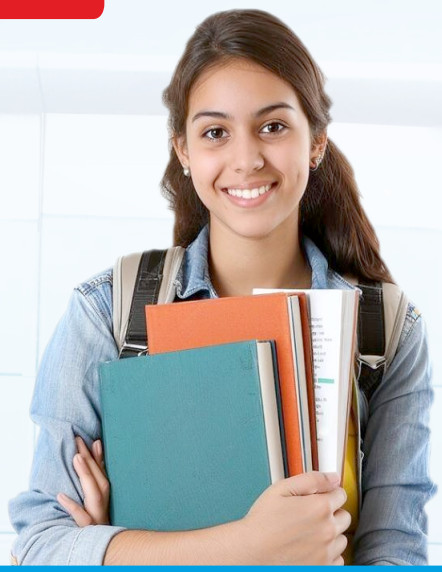

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Q.83 If the magnetic bearing of the Sun at noon in the southern hemisphere is 167°, the magnetic declination at that place would be:

(a) 13° E (b) 23° S
(c) 77° N (d) 13° W

Ans. (a)

End of Solution

Q.84 In the Arithmetic Increase Method, the population is assumed to increase at:

(a) Logistic pattern (b) Constant amount
(c) Constant rate (d) Variable rate

Ans. (b)

End of Solution

Q.85 Disinfection of water results in:

(a) Killing pathogenic bacteria (b) Removal of turbidity
(c) Removal of odour (d) Removal of hardness

Ans. (a)

End of Solution

Q.86 The method adopted for removing bushes, branches, debris, etc. from water is known as:

(a) Coagulation (b) Filtration
(c) Sedimentation (d) Screening

Ans. (d)

End of Solution

Q.87 Match the List I with List II and select the correct answer using the codes given below the lists:

List-I (Units)	List-II (Functions)
A. Primary settling tank	i. Solid-liquid separation
B. Trickling filter	ii. Removal of settleable solids
C. Secondary settling tank	iii. Sloughing of biomass
D. Waste stabilization pond	iv. Symbiotic reaction

Codes:

(a) A-ii, B-iii, C-i, D-iv (b) A-i, B-ii, C-iii, D-iv
(c) A-iv, B-iii, C-i, D-ii (d) A-iii, B-i, C-iv, D-ii

Ans. (a)

End of Solution

Q.88 The flow ratio of a Francis turbine, if it is working under a head of 62 m and velocity at inlet is 7 m/s, is ($g = 10\ m/s^2$):

(a) 0.3 (b) 0.4

(c) 0.1 (d) 0.2

Ans. (d)

End of Solution

Q.89 For maximum transmission of power through a pipeline with total head (H), the head loss due to friction (h_f) is given by:

(a) $\frac{H}{3}$ (b) 0.1 H

(c) $\frac{2}{3}H$ (d) $\frac{H}{2}$

Ans. (a)

End of Solution

Q.90 The velocity potential function for a line source varies with radial distance (r) as:

(a) $\frac{1}{r^2}$ (b) $ln(r)$

(c) r (d) $\frac{1}{r}$

Ans. (b)

End of Solution

Q.91 The horizontal to vertical side slope in case of Cipolletti weir is:

(a) 1 : 4 (b) 1 : 2

(c) 1 : 1 (d) 1 : 3

Ans. (a)

End of Solution

Q.92 For a hydraulically efficient triangular section, the hydraulic radius, R =

(a) $2\sqrt{2}y$ (b) $\frac{y}{2\sqrt{2}}$

(c) y (d) $\frac{y}{2\sqrt{2}}$

Ans. (b)

End of Solution

Q.93 Which of the following conditions is the chief characteristic of critical flow?

(a) $\frac{Q^2T^2}{gA^3}=1$ (b) $\frac{QT^2}{gA^2}=1$

(c) $\frac{Q^2R}{gA^3}=1$ (d) $\frac{Q^2T}{gA^3}=1$

Ans. (d)

End of Solution

Q.94 The friction factor (f) in a laminar pipe flow was found to be 0.04. The Reynolds number of the flow is:

(a) 800 (b) 2000

(c) 1600 (d) 1000

Ans. (c)

End of Solution

Q.95 Balancing the sight lengths for backsights and foresights is done to eliminate the error due to:

(a) Curvature and refraction (b) Small inclination of line of sight

(c) Faulty centering of level (d) Faulty staff

Ans. (a)

End of Solution

Q.96 A 20 m steel tape has a cross-section of 4 mm^2 and '*E*' for steel is 200 GN/m^2. The tape was standardized under a pull of 120 N and a pull applied during measurement was 80 N. The correct length of 20 m measured is:

(a) 19.999 m (b) 20.010 m

(c) 19.990 m (d) 20.001 m

Ans. (a)

End of Solution

Q.97 On a vertical photograph, the relief displacement is always radial from:

(a) Nadir point (b) Principal point

(c) Isocentre (d) None of the above

Ans. (b)

End of Solution

Q.98 Select the correct statement(s):

1. Triangulation is used for filling in the details.
2. Triangulation is referred to as a system of multiplying ground control points.
3. For a highway, a system of quadrilaterals is most suitable.

(a) Only 2 is correct
(b) 2 and 3 are correct
(c) 1 and 2 are correct
(d) Only 1 is correct

Ans. (b)

End of Solution

Q.99 As per IS 7784 (Part 2/Sec 1) : 1995, canal transition should preferably be provided with splays in the ratio of:

(a) Upstream 5 : 1 and Downstream 4 : 1
(b) Upstream 3 : 1 and Downstream 2 : 1
(c) Upstream 2 : 1 and Downstream 3 : 1
(d) Upstream 4 : 1 and Downstream 5 : 1

Ans. (c)

End of Solution

Q.100 Lacey's regime scour depth (D) is expressed as:
[where q = discharge, and f = silt factor]

(a) $1.35\left(\frac{q}{f}\right)^{1/3}$
(b) $1.35\left(\frac{q^2}{f}\right)^{1/6}$
(c) $1.35\left(\frac{q^2}{f}\right)^{1/3}$
(d) $1.35\left(\frac{q}{f}\right)^{1/6}$

Ans. (c)

End of Solution

Q.101 The minimum thickness (t) of the downstream floor in the design of weirs is expressed as: [where, G is the specific gravity of the floor material, and h is the ordinate of hydraulic gradient line above the top of the floor]

(a) $\left[\frac{h}{(G-1)}\right]^2$
(b) $\frac{h}{(G-1)}$
(c) $\left[\frac{h}{(G+1)}\right]^2$
(d) $\frac{h}{(G+1)}$

Ans. (b)

End of Solution

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Q.102 The Moody's Chart is a logarithmic chart between friction factor and _____ for a variety of relative roughness in a pipe flow.

(a) The discharge of the flow
(b) Reynolds number
(c) The velocity of the flow
(d) The density of the fluid

Ans. (b)

End of Solution

Q.103 The streamlines of a flow net are concentric circles. If the velocity at a radius of 0.6 m is 2.7 m/s, then the velocity at a radius of 0.9 m will be:

(a) 3.6 m/s
(b) 1.2 m/s
(c) 1.8 m/s
(d) 2.7 m/s

Ans. (c)

End of Solution

Q.104 The head loss caused due to sudden expansion of pipe from area A_1 to A_2 and the velocity from V_1 to V_2, is given by:

(a) $\left(1+\frac{A_2}{A_1}\right)^2, \frac{V_2^2}{2g}$
(b) $\left(1-\frac{A_2}{A_1}\right)^2, \frac{V_1^2}{2g}$
(c) $\left(1-\frac{A_1}{A_2}\right)^2, \frac{V_2^2}{2g}$
(d) $\left(1-\frac{A_1}{A_2}\right)^2, \frac{V_1^2}{2g}$

Ans. (d)

End of Solution

Q.105 If $\psi = 2xy$, the magnitude of velocity vector at $(2, -2)$ is:

(a) -8
(b) 4
(c) $\sqrt{2}$
(d) $4\sqrt{2}$

Ans. (d)

End of Solution

Q.106 The scale effects in models can be:

(a) Positive only
(b) Negative only
(c) Either positive or negative
(d) None of the above

Ans. (c)

End of Solution

Q.107 Find the extra widening of pavement on a two-lane highway having a longitudinal circular curve of radius 300 m. Design speed = 80 kmph and length of wheelbase of the largest vehicle = 6 m.

(a) 0.8 m
(b) 0.5 m
(c) 0.4 m
(d) 0.6 m

Ans. (d)

End of Solution

Q.108 Consider the corrections to be applied to the basic length of a runway:

1. Elevation correction
2. Gradient correction
3. Temperature correction

The correct order of applying these corrections to obtain the runway length is:

(a) 1, 3, 2
(b) 1, 2, 3
(c) 2, 3, 1
(d) 3, 1, 2

Ans. (a)

End of Solution

Q.109 Bitumen of 80/100 grade means:

(a) Its penetration value is 8 mm
(b) Its penetration value is in between 8 cm to 10 cm
(c) Its penetration value is 10 mm
(d) Its penetration value is in between 8 mm to 10 mm

Ans. (d)

End of Solution

Q.110 The terrain may be classified as rolling terrain, if the cross slope of land is:

(a) more than 60%
(b) up to 10%
(c) 10% to 25%
(d) 25% to 60%

Ans. (c)

End of Solution

Q.111 A 3° curve is situated on a ruling gradient of 1 in 250 on a broad gauge (BG) track. What should be the actual ruling gradient considering the grade compensation of curvature?

(a) 1 in 200
(b) 0.28%
(c) 1 in 300
(d) 0.4%

Ans. (b)

End of Solution

Q.112 Which of the following is a cumulative elemental toxin?

(a) Sodium (b) Bromine
(c) Cadmium (d) Chromium

Ans. (c)

End of Solution

Q.113 The sanitation system in which a small portion of storm water is allowed to enter the sanitary sewers, and the remaining storm water flows in separate set of sewers, is known as:

(a) Partially separate system (b) Combined system
(c) Partially combined system (d) Separate system

Ans. (c)

End of Solution

Q.114 For fish habitat in a river, the minimum dissolved oxygen required is:

(a) 10 mg/L (b) 4 mg/L
(c) 2 mg/L (d) 8 mg/L

Ans. (b)

End of Solution

Q.115 The instrument used for measuring area on a contour map is:

(a) Graphometer (b) Planimeter
(c) Clinometer (d) Arcameter

Ans. (b)

End of Solution

Q.116 Which instrument is used for measurement of odour of water?

(a) Potentiometer (b) Olfactometer
(c) Gravimeter (d) Tintometer

Ans. (b)

End of Solution

Q.117 The tacheometric method of surveying is generally preferred for:

(a) Fixing points with highest precision (b) Rough or uneven terrain
(c) Providing primary control (d) Large scale survey

Ans. (b)

End of Solution

Q.118 In Mirri's hyperbolic channel transition design for cross drainage work, the bed width is given by:

[B_n = Bed width of normal canal section;
B_f = Bed width of flumed canal section;
B_X = Bed width at any distance 'x' from flumed section;
L_t = Length of the transition]

(a) $B_X = \dfrac{B_n \cdot B_f}{B_n - (B_n - B_f)X}$

(b) $B_X = \dfrac{B_n \cdot B_f}{L_f \cdot B_n - (B_n - B_f)X}$

(c) $B_X = \dfrac{B_n \cdot B_f \cdot L_f}{L_f \cdot B_n - (B_n - B_f)X}$

(d) $B_X = \dfrac{B_n \cdot L_f}{B_n - (B_n - B_f)X}$

Ans. (c)

End of Solution

Q.119 The bottom most layer of pavement is known as:

(a) Subgrade
(b) Base course
(c) Wearing course
(d) Sub-base course

Ans. (a)

End of Solution

Q.120 The rainfall on five successive days on a catchment was 2, 6, 9.5 and 3 cm. If the f index of this storm is assumed to be 3 cm/day, the total direct runoff from the catchment is:

(a) 10 cm
(b) 11 cm
(c) 22 cm
(d) 20 cm

Ans. (b)

End of Solution

Q.121 Annual and seasonal hydrographs are not utilized directly in:

(a) Drought studies
(b) Reservoir studies
(c) Stream mapping
(d) Estimating the surface water potential of stream

Ans. (c)

End of Solution

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Q.122 In a certain situation, wastewater is discharged into a river, mixes with river water instantaneously and completely. Following data is available:

Wastewater: DO = 2.0 mg/L, Discharge rate = 1.0 m^3/s

River water: DO = 8.3 mg/L, Flow rate = 8.0 m^3/s, Temperature = 20°C

Initial amount of DO in the mixture of waste and river shall be:

(a) 8.6 mg/L (b) 5.3 mg/L
(c) 6.5 mg/L (d) 7.6 mg/L

Ans. (d)

End of Solution

Q.123 At a water treatment plant, 16 million litres of water is treated daily, using alum dosage of 30 mg/L. The total quantity of alum used daily is:

(a) 390 kg (b) 370 kg
(c) 460 kg (d) 480 kg

Ans. (d)

End of Solution

Q.124 Deep pits are dug in desert areas or in the sea bottom to dispose of which waste?

(a) Agricultural waste (b) Radioactive waste
(c) Industrial waste (d) Sewage waste

Ans. (b)

End of Solution

Q.125 When the sewage is to be distributed over a level area for irrigation surrounded by dykes (i.e. trenches), the method of sewage used is called:

(a) Surface irrigation (b) Free flooding
(c) Furrow irrigation (d) Spray irrigation

Ans. (b)

End of Solution

■■■■