UPPSC-2019

UTTAR PRADESH PUBLIC
SERVICE COMMISSION 2019

Assistant Engineer

Civil Engineering
PAPER-II
Exam held on 13-12-2020

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Questions and Answer Keys

Q.1 A large tank near Mahoba, temples at Ajaygarh and Mahoba and city of Rajavasini were built by a Chandella King
    (a) Nannuk   (b) Vakpati
    (c) Rahil   (d) Jayashakti

Ans. (c)

Q.2 Which of the following Rights a cultivator enjoyed on his own land during the Mughal period?
    (a) Right to mortgage only
    (b) Right to sell and gift
    (c) Right to mortgage and gift
    (d) All the above rights

Ans. (c)

Q.3 Match List-I with List-II and select the correct answer using the code given below.

List-I (Tribes)	List-II (States)
A. Tharus	1. Madhya Pradesh
B. Todas	2. Jharkhand
C. Santhal	3. Uttarakhand
D. Gond	4. Tamil Nadu

Code:

	A	B	C	D
(a)	1	3	4	2
(b)	4	2	1	3
(c)	2	1	3	4
(d)	3	4	2	1

Ans. (d)

Q.4 Match List-I with List-II and choose the correct answer using the code given below:

List-I (Text)
A. Kiratarjuniyam
B. Dashakumar Charitam
C. Buddha Charitam
D. Vikramorvashiyam

List-II (Writer)
1. Dandi
2. Kalidas
3. Bharavi
4. Ashvaghosha

Code:

	A	B	C	D
(a)	3	4	1	2
(b)	3	1	4	2
(c)	2	3	1	4
(d)	1	3	2	4

Ans. (b)

Q.5 Match List-I with List-II and choose the correct answer using the code given below:

List-I (Text)
A. Nokrek
B. Agasthyamalai
C. Nandadevi
D. Dehang Debang

List-II (Writer)
1. Uttarakhand
2. Arunachal Pradesh
3. Kerala
4. Meghalaya

Code:

	A	B	C	D
(a)	4	3	1	2
(b)	4	3	2	1
(c)	3	4	1	2
(d)	2	3	4	1

Ans. (a)

Q.6 States get share of the revenue from
    (a) Income Tax
    (b) Customs Revenue
    (c) Excise Tax
    (d) Surcharge on Income Tax

Ans. (c)

Q.7 Which Article of the Indian Constitution empowers Parliament to make law for implementing international agreements?
    (a) Article 249   (b) Article 250
    (c) Article 252   (d) Article 253

Ans. (d)

Q.8 Who appoints the acting Chief Justice of India?
    (a) Chief Justice of India
    (b) Chief Justice of India with previous consent of the President
    (c) President of India
    (d) President in consultation with the Chief Justice of India

Ans. (c)

Q.9 The rotation intensity of Maize-Mustard-Mung crop is
    (a) 100%   (b) 200%
    (c) 300%   (d) 400%

Ans. (c)

Q.10 Which of the following is NOT a Kharif crop?
    (a) Soyabean   (b) Lentil
    (c) Cotton   (d) Pigeon pea

Ans. (b)

Q.11 'Five Star Village Scheme' started by Government of India in September 2020 relates to which one of the following?
    (a) Electricity Supply
    (b) Postal Service Schemes
    (c) Health Services
    (d) Primary Education

Ans. (b)

Q.12 Who won the US Open 2020, Mens Tennis Singles Title on 14th September, 2020?
    (a) Alex Zverev   (b) Dominic Thiem
    (c) D. Medvedev   (d) P.C. Busta

Ans. (b)

Q.13 Which of the following pairs is NOT correctly matched?

Ancient name of the cities		Modern name of the cities
(a) Esipattan	–	Saranath
(b) Dashapur	–	Mandsor
(c) Banvasi	–	Talkad
(d) Mahoday	–	Kannauj

Ans. (a)

Q.14 The early farming site located on the bank of lake is
    (a) Mehargarh   (b) Lahuradeva
    (c) Chirand   (d) T. Narsipur

Ans. (c)

Q.15 Author of the 'Dastane Mazahib' which discusses about the Din-i-Ilahi of Akbar, was
    (a) Mohammad Rabbani
    (b) Mohsin Faani
    (c) Badauni
    (d) Afif

Ans. (b)

Q.16 Who was appointed the Minister of 'Ministry of Rehabilitation' set up on 06 September, 1947?
    (a) S.P. Mukerji
    (b) Sardar Vallabhabhai Patel
    (c) J.L. Nehru
    (d) K.C. Niyogi

Ans. (d)

Q.17 Match **List-I** with **List-II** and select the correct answer using the code given below:

List-I (States)	List-II (Highest Peaks)
A. Tamil Nadu	1. Dhoopgarh
B. Rajasthan	2. Saramati
C. Nagaland	3. Guru Shikhar
D. Madhya Pradesh	4. Doda Betta

Code:

	A	B	C	D
(a)	3	4	1	2
(b)	1	2	4	3
(c)	4	3	2	1
(d)	2	1	3	4

Ans. (c)

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Q.18 'Leopold Matrix' is associated with
(a) Weather Forecasting
(b) Disaster Management
(c) Environmental Impact Assessment Method
(d) Environment Law

Ans. (c)

Q.19 The Joint Sitting of the Indian Parliament for transacting a legislative business is presided over by
(a) The President of India
(b) The senior most Member of Parliament
(c) The Chairman of the Rajya Sabha
(d) The Speaker of the Lok Sabha

Ans. (d)

Q.20 The term 'Office of Profit' has been defined by the
(a) Constitution
(b) Parliament
(c) Supreme Court
(d) Union Council of Ministers

Ans. (c)

Q.21 While deciding any question relating to the disqualification of a Member of Parliament, the President shall obtain the opinion of
(a) Election Commission
(b) Chief Justice of India
(c) Attorney General
(d) Speaker of the Lok Sabha

Ans. (a)

Q.22 Soyabean seed contains
(a) 20% protein and 40% oil
(b) 40% protein and 10% oil
(c) 40% protein and 20% oil
(d) 20% protein and 20% oil

Ans. (c)

Q.23 As per the results of 'Swachh Sarvekshan 2020', announced by Ministry of Housing and Urban Affairs on 20th August 2020, which is the Cleanest City in Uttar Pradesh?
(a) Agra
(b) Gaziabad
(c) Lucknow
(d) Prayagraj

Ans. (c)

Q.24 How many teachers from Uttar Pradesh were selected for 'National Award' on Teachers day 5th Sept., 2020?
(a) Six
(b) Five
(c) Four
(d) Three

Ans. (d)

Q.25 'Poshan Maah' was celebrated by Government of India in the year 2020, in which of the following months?
(a) September
(b) August
(c) July
(d) June

Ans. (a)

Q.26 An irrigation channel designed by Lacey's theory has a mean velocity of 1.5 m/s. The silt factor is unity. The hydraulic mean radius will be
(a) 2.5 m
(b) 1.5 m
(c) 5.625 m
(d) 6.525 m

Ans. (c)

Q.27 At a hydraulic jump, the depths at the two sides are 0.4 m and 1.4 m, the head loss in the jump is
(a) 1.0 m
(b) 0.9 m
(c) 0.7 m
(d) 0.45 m

Ans. (d)

Q.28 The contact pressure P_C, tyre pressure P and rigidity factor R are related by

(a) $\dfrac{P}{P_C} = R$
(b) $\dfrac{P_C}{P} = R$

(c) $P \times P_C = R$
(d) $R = \sqrt{(P \times P_C)}$

Ans. (b)

Q.29 If modulus of elasticity of the subgrade is 25 MPa, then deflection at the surface of flexible pavement due to a wheel load of 40 kN and a tyre pressure of 0.6 MPa will be
(a) 5.24 mm
(b) 6.20 mm
(c) 7.40 mm
(d) 8.32 mm

Ans. (a)

Q.30 The design speed of a traffic lane is 70 kmph. What is the theoretical capacity per hour taking the total reaction time to be 2 seconds and average length of vehicle as 8 m?
(a) 828
(b) 728
(c) 628
(d) 528

Ans. (b)

Q.31 Calculate the stopping sight distance, given that velocity v = 100 kmph and friction f = 0.10.
(a) 464 m
(b) 563 m
(c) 860 m
(d) 840 m

Ans. (a)

Q.32 The following items are considered for the selection of site for an airport, Mark the incorrect option.
(a) Class of airport
(b) Visibility at airport site
(c) Altitude
(d) Runway orientation

Ans. (a)

Q.33 The order in which a road is built as from bottom to top
(a) subsoil, base, subgrade, subbase
(b) base, subsoil, subgrade, subbase
(c) subbase, base, subgrade, subsoil
(d) subsoil, subgrade, subbase, base

Ans. (d)

Q.34 A vehicle moving at 50 km/h speed was stopped by applying brakes and the length of the skid marks was 18 m. If the average skid resistance of the pavement is 0.75, the brake efficiency (in %) of the test vehicle will be
(a) 71.12%
(b) 72.83%
(c) 73.48%
(d) 74.62%

Ans. (b)

Q.35 For a sleeper density of (n + 5) the number of sleepers required for constructing a Broad Gauge (BG) railway track of length 650 m is given by
(a) 1000
(b) 900
(c) 800
(d) 700

Ans. (b)

Q.36 The type of the camber which is best suited for cement concrete pavement is
(a) Straight line
(b) Parabolic
(c) Elliptical
(d) Composite

Ans. (a)

Q.37 Which one is NOT a road pattern?
(a) Block pattern
(b) Star and block pattern
(c) Hexagonal pattern
(d) Diamond pattern

Ans. (d)

Q.38 If the methyl orange alkalinity of water equals or exceeds total hardness, all of the hardness is
(a) Non-carbonate hardness
(b) Carbonate hardness
(c) Pseudo hardness
(d) Negative non-carbonate hardness

Ans. (b)

Q.39 When waste water is disposed of into a running stream, four zone are formed. In which one of the following zones, will the minimum level of dissolved oxygen be found?
(a) Zone of degradation
(b) Zone of active decomposition
(c) Zone of recovery
(d) Zone of clear water

Ans. (b)

Q.40 Hairs of human nose can remove all the particles of size greater than
(a) 1 micron
(b) 10 micron
(c) 100 micron
(d) None of these

Ans. (b)

Q.41 Match **List-I** with **List-II** and select the correct answer using the codes given below:
    List-I (Treatment Unit)
A. Grit chamber
B. Primary sedimentation
C. Activated sludge
D. Sludge digestion

List-II (Detention Time)
1. Six hours
2. Two minutes
3. Two hours
4. Twenty days
Codes:

	A	B	C	D
(a)	3	1	4	2
(b)	2	3	1	4
(c)	2	1	3	4
(d)	1	2	3	4

Ans. (b)

Q.42 The best system for distribution of water in a randomly planned city is
(a) Dead end system
(b) Grid iron system
(c) Ring system
(d) Radial system

Ans. (a)

Q.43 Which one of the following type of transition curves is mostly used in Indian Railways?
(a) Cubic parabola (b) Lemniscate
(c) Cubic spiral (d) Eular's spiral

Ans. (a)

Q.44 The Govt. of India, appointed the National Transport Policy Committee in the year,
(a) 1978 (b) 1973
(c) 1956 (d) 1943

Ans. (a)

Q.45 Flexible pavement distributed the wheel load
(a) Directly to subgrade
(b) Through a set of layers to the subgrade
(c) Through structural action
(d) None of the above

Ans. (d)

Q.46 The total correction for elevation temperature and gradient for a runway, should NOT be more than
(a) 35% (b) 25%
(c) 15% (d) 10%

Ans. (a)

Q.47 The population of a town three consecutive years are 5000, 7000 and 8400 respectively. The population of the town in the fourth consecutive year according to the Geometric increase method is
(a) 9500 (b) 9800
(c) 10100 (d) 10920

Ans. (d)

Q.48 pH = 4 when compared to pH = 7, will be more acidic by
(a) 3 times (b) 300 times
(c) 1000 times (d) None of these

Ans. (c)

Q.49 One litre of sewage when allowed to settle for 30 minutes gives a sludge volume of 30 cm^3. If the dry weight of this sludge is 3.0 gms, then the sludge volume index will be
(a) 20 (b) 30
(c) 10 (d) 40

Ans. (c)

Q.50 High COD to BOD ratio of an organic pollutant represents
(a) High biodegradability of the pollutant
(b) Low biodegradability of the pollutant
(c) Presence of free oxygen for aerobic decomposition
(d) Presence of toxic material in the pollutant.

Ans. (b)

Q.51 Which of the following treatment process are necessary for the removing suspended solid from water?
1. Coagulation
2. Sedimentation
3. Flocculation
4. Disinfection
Select the correct answer using the codes given below:
(a) 1 and 2 (b) 1, 2 and 3
(c) 2 and 4 (d) 1 and 4

Ans. (b)

Q.52 If the coliform bacterial is present in a sample of water, then the coliform test to be conducted is
(i) Presumptive coliform test
(ii) Confirmed coliform test
(iii) Completed coliform test
The correct answer is
(a) (i) only
(b) Both (i) and (ii)
(c) Both (i) and (ii)
(d) All of the above

Ans. (d)

Q.53 The relative stability of a sewage sample whose D.O. equals the total oxygen required to satisfy its BOD is
(a) Zero   (b) 1%
(c) 100%   (d) Infinity

Ans. (c)

Q.54 Which of the following parameters are employed in the design of Trickling filter?
1. Hydraulic loading rate
2. Organic loading rate
3. Detention time
4. Weir loading rate
(a) 1, 2, 3 and 4   (b) 1 and 2 only
(c) 2 and 3 only   (d) 3 and 4 only

Ans. (b)

Q.55 The slope of a 1.0 m diameter concrete sewer laid at a slope of 1 in 1000 develops a velocity of 1 m/second, when flowing full. When it is flowing half full, the velocity of flow through the sewer will be
(a) 0.5 m/sec   (b) 1.0 m/sec
(c) $\sqrt{2.0}$ m/sec   (d) 2.0 m/sec

Ans. (b)

Q.56 Self purification of running streams may be due to
(a) Sedimentation, Oxidation and Coagulation
(b) Dilution, Sedimentation and Oxidation
(c) Dilution, Sedimentation and Coagulation
(d) Dilution, Oxidation and Coagulation

Ans. (b)

Q.57 If the height of a tower is 50 m, flying height of the aircraft above the base is 5000 m and the image of the top of the tower is 20 cm, from the principal point, what will be the height displacement.
(a) 2 cm   (b) 1 cm
(c) 0.2 cm   (d) 0.2 cm

Ans. (c)

Q.58 The perpendicular offset from a tangent to the junction of transition curve and circular curve is equal to
(Where L = Length of transition curve, R = Radius of the circular curve)
(a) $\dfrac{L}{6R}$ (b) $\dfrac{L}{24R}$
(c) $\dfrac{L^2}{6R}$ (d) $\dfrac{L^2}{24R}$

Ans. (c)

Q.59 In a survey, A and B are two points. Already located with respect to A and B, point C is located by taking two reading and then line CD is measured. The D is a point on AB. The line CD is known as
(a) Base line
(b) Check line
(c) Tie line
(d) Additional line

Ans. (c)

Q.60 A tunnel should NOT be constructed along
(a) Strike direction
(b) Dip direction
(c) Oblique to the bed altitude
(d) Both along dip and strike direction

Ans. (a)

Q.61 Refraction error is least in case of
(a) Stadia tacheometry
(b) Tangential tacheometry
(c) Subtense bar tacheometry
(d) Omnimeters

Ans. (c)

Q.62 If two triangulation signals of 6.75 m height each are to be just visible over ground mutually, what is the maximum distance between their locations on the ground surface?

(a) 10 km (b) 20 km

(c) 30 km (d) 50 km

Ans. (b)

Q.63 The system that uses the sun as a source of electromagnetic energy and records the naturally radiated and reflected energy from the object is called

(a) Geographical Information System (GIS)

(b) Global Positioning System (GPS)

(c) Passive Remote Sensing (PRS)

(d) Active Remote Sensing (ARS)

Ans. (c)

Q.64 The ratio of curvature correction to that of refraction is

(a) 3 (b) 12

(c) 14 (d) 7

Ans. (d)

Q.65 In a vertical curve, an upgrade of 2.0% is followed by a downgrade of 2.0%. The rate of change of grade is 0.05% per 20 m chain. The length of the vertical curve will be

(a) 800 m (b) 1000 m

(c) 1200 m (d) 1600 m

Ans. (d)

Q.66 Repetition of beds on a geological map may be due to

(a) Unconformity (b) Disconformity

(c) Faulting (d) Folding

Ans. (d)

Q.67 The velocity distribution in turbulent flow is a function of the distance 'y' measured from the boundary surface and the friction velocity μ and follows a

(a) parabolic law (b) hyperbolic law

(c) logarithmic law (d) linear law

Ans. (c)

Q.68 While conducting flow measurements using a rectangular notch, an error of 2% in head over the notch and error 3% in the length was observed. The percentage error in the computed discharge would be

(a) +6% (b) –1%

(c) –2.5% (d) Zero

Ans. (a)

Q.69 A pipe is said to be equivalent to another if, in both

(a) Length and discharge are the same

(b) Velocity and diameter are the same

(c) Discharge and frictional head loss are the same

(d) Length and diameter are the same

Ans. (c)

Q.70 A channel designed by Lacey's theory has a mean velocity of 1 m/s and silt factor of unity. The hydraulic mean radius will be

(a) 2.5 m (b) 2 m

(c) 1 m (d) 0.5 m

Ans. (a)

Q.71 The pressure drop per unit length of pipe ($\Delta P/L$) in Laminar flow is dependent on the velocity, viscosity and diameter. It is equal to

(a) $\dfrac{d^2}{32\mu V}$ (b) $\dfrac{32\mu VL}{\gamma d^2}$

(c) $\dfrac{32\mu V}{d^2}$ (d) $\dfrac{8\mu V}{d^2}$

Ans. (c)

Q.72 The ratio of pressures between the two points A and B located respectively at depth 0.25 m and 0.75 m below a constant level of water in a tank is

(a) 1:2 (b) 1:3

(c) 1:4 (d) 1:5

Ans. (b)

Q.73 A circular plate 1 m in diameter is submerged vertically in water such that its upper edge is

8 m below the free surface of water. The total hydrostatic pressure force on one side of the plate is

(a) 6.7 kN   (b) 65.4 kN
(c) 45.0 kN   (d) 77.0 kN

Ans. (b)

Q.74 When there is an increase in the atmospheric pressure, the water level in a well penetrating a confined aquifer

(a) decreases
(b) increases
(c) does not undergo any change
(d) decrease or increase depending on the elevation of the ground.

Ans. (a)

Q.75 A turbine in which the total energy of water available is converted to kinetic energy is called

(a) Axial flow turbine
(b) Reaction turbine
(c) Impulse turbine
(d) Mixed flow turbine

Ans. (c)

Q.76 Discharge per unit drawdown at a well is called,

(a) Specific storage
(b) Specific yield
(c) Specific capacity
(d) None of the above

Ans. (c)

Q.77 A stream that provides water to the water table is termed as

(a) Affluent   (b) Influent
(c) Ephemeral   (d) Effluent

Ans. (b)

Q.78 The observed annual runoff from a basin of area 500 km^2 is 150 Mm^3 and the corresponding annual rainfall over the basin during the same years is 750 mm. What is the runoff coefficient?

(a) 0.2   (b) 0.67
(c) 0.4   (d) 0.5

Ans. (c)

Q.79 The Theissen weights of 4 rain gauges A, B, C and D covering a river basin are 0.15, 0.25, 0.30 and 0.30 respectively. If the average depth of rainfall for the basin is 5 cm and rainfall recorded at B, C and D are 5 cm, 4 cm and 5 cm respectively, what is the rainfall at A?

(a) 5 cm   (b) 6 cm
(c) 7 cm   (d) 8 cm

Ans. (c)

Q.80 Water is to be lifted by a net head of 240 m. Identical pumps each with specific speed of 30 and rotational speed of 1450 rpm with design discharge 0.2 m^3/s are available. The number of pumps required will be

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

Ans. (c)

Q.81 For one-dimensional flow without recharge in an unconfined aquifer between two water bodies, the steady water table profile is

(a) a straight line   (b) a parabola
(c) an ellipse   (d) an arc of a circle

Ans. (b)

Q.82 As per the recommendation of the Bureau of Indian Standards, the shape of the lined canal is

(a) Circular   (b) Trapezoidal
(c) Parabolic   (d) Elliptic

Ans. (b)

Q.83 Geological strata between ground surface and water table is also termed as

(a) Piezometric zone
(b) Phreatic zone
(c) Vadose zone
(d) Saturated zone

Ans. (c)

Q.84 The standard BOD$_5$ at 20°C, when compared to BOD$_U$ is

(a) 50%   (b) 68%
(c) 75%   (d) 100%

Ans. (b)

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Q.85 Sludge bulking can be controlled by
(a) Chlorination　　(b) Coagulation
(c) Aeration　　　　(d) Denitrification

Ans. (a)

Q.86 Uniformity coefficient of filter sand is given by
(a) $\dfrac{D_{60}}{D_5}$ 　　(b) $\dfrac{D_{50}}{D_5}$

(c) $\dfrac{D_{50}}{D_{10}}$ 　　(d) $\dfrac{D_{60}}{D_{10}}$

Ans. (d)

Q.87 Which of the following causes a decrease demand of water in per capita consumption?
(a) Use of metering system
(b) Good quality of water
(c) Better standard of living of the people
(d) Hotter climate

Ans. (a)

Q.88 The following data pertain to a sewage sample:
Initial DO = 9.5 mg/L;
Final DO = 2 mg/L; Dilution = 1%
The BOD of the given sample is
(a) 7.5 mg/L　　(b) 10 mg/L
(c) 75 mg/L　　(d) 750 mg/L

Ans. (d)

Q.89 The tilt in an aerial photograph is radial from
(a) Nadir point　　(b) Principal point
(c) Isocentric point (d) Plumb point

Ans. (c)

Q.90 The staff reading at a distance of 80 m from a level with bubble at its centre is 1.52 m and when it is moved 5 division out of the centre, the reading is 1.60 m. The angular value of the bubble is
(a) 20.62"　　(b) 41.25"
(c) 14.55"　　(d) 25.5"

Ans. (b)

Q.91 In GIS the process used for modifying map features to make them clear at a reduced scale is known as

(a) Cartographic Generalisation
(b) Database Generalisation
(c) Topographical Encoding
(d) Data Filtering

Ans. (a)

Q.92 An Engineer measured the distance between two locations on a plan having a scale of 1 cm = 50 m as 600 m. Later, however, he found that he used a wrong scale of 1 cm = 30 m to measure the distance. The true distance between the locations is
(a) 200 m　　(b) 250 m
(c) 500 m　　(d) 1000 m

Ans. (d)

Q.93 Streak of a mineral is
(a) Its appearance in diffused light as obtained by rotating it
(b) Colour of the powder of a coloured mineral as obtained by rubbing it on a porcelain plate
(c) Its appearance in thin section as seen under a polarizing microscope
(d) None of these

Ans. (b)

Q.94 A road segment of length 1 km scales 6 cm on a vertical photograph. The focal length of the camera is 150 mm. If the terrain is nearly plain, then the flying height of the aircraft will be
(a) 2500 m　　(b) 25 km
(c) 250 km　　(d) 250 m

Ans. (a)

Q.95 If the probable error in single observation is ±0.04 m and that of the mean is ±0.01 m, then the number of observations are
(a) 4　　(b) 10
(c) 16　　(d) 64

Ans. (c)

Q.96 Tangential method of tacheometry is
(a) Slower than stadia hair method
(b) Faster than stadia hair method

(c) Preferred as it involves less computations to get reduced distance

(d) Preferred as chances of operational error are less compared to stadia hair method

Ans. (a)

Q.97 Method adopted for measurement of horizontal angle using theodolite in case when several angles of well distributed point/objects are to be measured from the same instrument station is

(a) Repetition　　　(b) Double angle

(c) Reiteration　　　(d) All of the above

Ans. (c)

Q.98 Two straights AB and BC have the bearing of 70° and 120°, respectively. They are to be connected by a circular curve. The deflection angle will be

(a) 130°　　　　　(b) 70°

(c) 50°　　　　　(d) 120°

Ans. (c)

Q.99 The following boundary condition exists at the wall ($y = 0$) in a boundary layer

(a) $u = U$

(b) $\dfrac{dP}{dX} = -\text{ve}$

(c) $\tau_0 = 0$

(d) $u = 0, v = 0$

Ans. (d)

Q.100 A hydraulic ram works on the

(a) Principle of centrifugal action

(b) Principle of water hammer

(c) Principle of reciprocating action

(d) None of the above

Ans. (b)

Q.101 Uniform flow in an open channel exists, when the flow is steady and the channel is

(a) Prismatic

(b) Non-prismatic and depth of flow is constant along the channel

(c) Prismatic and depth of flow is constant along the channel

(d) Frictionless

Ans. (c)

Q.102 For hydraulically efficient rectangular channel section, the ratio of width to normal depth is

(a) 0.5　　　　　(b) 1.0

(c) $2\sqrt{3}$　　　　(d) 2.0

Ans. (d)

Q.103 As the depth of immersion of a vertical plane surface increase, the location of centre of pressure

(a) Moves apart from the centre of gravity of the area

(b) Comes closer to the centre of gravity of the area

(c) Coincide with the centre of gravity of the area

(d) Remains unaffected

Ans. (b)

Q.104 Hydraulic jump occurs when

(a) Flow is super critical

(b) Flow is sub critical

(c) Flow is super critical and downstream depth is adequate

(d) None of the above

Ans. (c)

Q.105 In a model experiment with weir, if the dimensions of the model weir are reduced by a factor K, the flow rate through the model weir is the following fraction of the flow rate through prototype

(a) $K^{5/2}$　　　　　(b) K^2

(c) 1　　　　　　(d) K^{-2}

Ans. (a)

Q.106 In differential manometer used in a venturimeter along a water pipeline, if an error of 2 mm has been made in observing a differential head of 10 mm, the percentage error in pressure difference is

(a) 12.6　　　　　(b) 25.2

(c) 20　　　　　　(d) 10

Ans. (c)

Q.107 Two identical pipes of length L, diameter D and friction factor f, are connected in parallel

between two points. The length of a single pipe of diameter D and the same friction factor f, equivalent to the above pair is

(a) $\sqrt{2L}$ (b) $\dfrac{L}{2}$

(c) $\dfrac{L}{\sqrt{2}}$ (d) $\dfrac{L}{4}$

Ans. (d)

Q.108 With rise in pressure, the bulk modulus of liquid
(a) Remains constant
(b) Increases
(c) Decreases
(d) None of the above

Ans. (b)

Q.109 The highest velocity for flow of water of viscosity 0.02 Poise to be laminar in a 10 mm pipe is
(a) 100 cm/s (b) 200 cm/s
(c) 300 cm/s (d) 400 cm/s

Ans. (*)

Q.110 When an irrigation canal is taken over a drainage channel the crossing is called
(a) an aqueduct (b) a super passage
(c) a level crossing (d) None of the above

Ans. (a)

Q.111 Lacey's scour depth for a stream, carrying a discharge of 3 cumecs per meter width and having a silts factor 1.2 is
(a) 1.32 m (b) 2.64 m
(c) 3.96 m (d) 4.32 m

Ans. (b)

Q.112 The discharge passing over an ogee spillway, per unit length of its apex line is proportional to (where H is head over the apex of its crest)
(a) H (b) H^2
(c) $H^{1/2}$ (d) $H^{3/2}$

Ans. (d)

Q.113 Lysimeter is an instrument used to measure
(a) evaporation
(b) infiltration
(c) evapotranspiration
(d) transpiration

Ans. (c)

Q.114 The relation between duty D in hectares/cumec, depth of water Δ in meter and base period B in days is given by

(a) $\Delta = \dfrac{1.98B}{D}$ (b) $\Delta = \dfrac{8.64B}{D}$

(c) $\Delta = \dfrac{5.68B}{D}$ (d) $\Delta = \dfrac{8.64D}{B}$

Ans. (b)

Q.115 The use of unit hydrographs for estimating floods is generally limited to catchments of size less than
(a) 5000 Km^2 (b) 500 Km^2
(c) 10^6 Km^2 (d) 5000 ha

Ans. (a)

Q.116 According to Khosla, to keep the structure safe against piping, exit gradient to be provided lies between
(a) 0.10 and 0.15 (b) 0.15 and 0.20
(c) 0.20 and 0.26 (d) 0.25 and 0.30

Ans. (b)

Q.117 Lateral infiltration is the major drawback in the following type of infiltrometer as
(a) Simple tube
(b) Double ring
(c) Sprinkling type
(d) Rainfall simulator

Ans. (a)

Q.118 Isolated storm is represented in a hydrograph with
(a) Single peak
(b) Multiple peak
(c) Complex peak
(d) Without single peak

Ans. (a)

Q.119 The deficiency of soil moisture through the earth surface is termed as
(a) Rainfall (b) Runoff
(c) Infiltration (d) Water table

Ans. (c)

Q.120 In a CBR test, the load sustained by a remoulded soil specimen at 5 mm penetration is 120 kg. The CBR value of the soil will be
(a) 9.2% (b) 7.3%
(c) 5.84% (d) 2.4%

Ans. (c)

Q.121 The type of transition curve that is generally provided on hill road is
(a) Circular (b) Cubic parabola
(c) Lemniscate (d) Spiral

Ans. (d)

Q.122 It is a common practice to design a highway to accomodate the traffic volume corresponding to
(a) Peak hour (b) 15 min. peak period
(c) 30th hour (d) Average daily traffic

Ans. (c)

Q.123 The safe speed on transition curve of BG track can be calculated by using formula
(a) $4.35\sqrt{R-67}$ (b) $4.4\sqrt{R-70}$
(c) $3.65\sqrt{R-6}$ (d) None of the above

Ans. (a)

Q.124 The maximum limit of super elevation on BG track in India is
(a) 76.2 mm (b) 83.2 mm
(c) 101.6 mm (d) 165.1 mm

Ans. (d)

Q.125 As per Indian and Road Congress (IRC) recommendation, minimum radius of horizontal curve on urban roads in plain terrain when the design speed is 60 km/h and super elevation is limited to 7% is
(a) 120 m (b) 125 m
(c) 130 m (d) 135 m

Ans. (c)

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