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Q : 1) A jet of water has a diameter of 0.3 cm. The absolute surface tension of water is 0.072 N/m and atmospheric pressure is 101.2 kN/m^2. The absolute pressure within the jet of water will be

A : 101.104 kN/m^2

B : 101.152 kN/m^2

C : 101.248 kN/m^2

D : 101.296 kN/m^2

Q : 2) The flow is said to be critical flow if Froude number is .....

A : Equal to 1

B : Equal to 0

C : Less than 1

D : More than 1

Q : 3) A fluid in which shear stress is more than the yield value and shear stress is proportional to the rate of shear strain is known as:

A : Newtonian fluid

B : Ideal fluid

C : Real fluid

D : Ideal plastic fluid

Q : 4) For pseudoplastic non-Newtonian fluids, the apparent viscosity

A : Increases with increasing deformation rate

B : decreases with increasing deformation rate

C : Is independent of the deformation rate

D : Decreases with time

Q : 5) Centre of pressure of an inclined plane surface is:

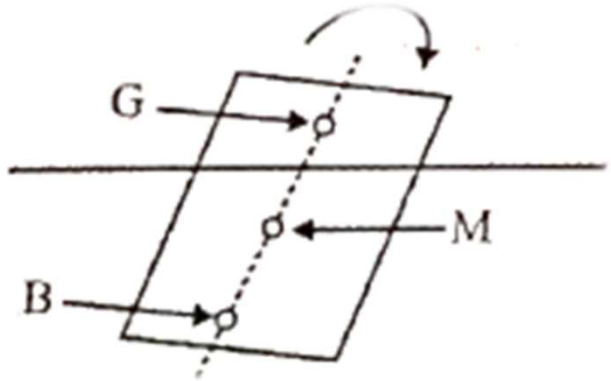
A : $\frac{I_G.sin^2\,\theta}{A\overline{x}} + \overline{x}$

B : $\frac{I_G.sin\,\theta}{A\overline{x}} + \overline{x}$

C : $\frac{I_G.sin^2\,\theta}{A\overline{x}} - \overline{x}$

D : $\frac{I_G.sin^2\,\theta}{A^2\overline{x}} + \overline{x}$

Q : 6) A body is flowing as shown in the given figure. The centre of buoyancy, centre of gravity and metacentre are leveled respectively as B, G and M. The body is



A : Vertically stable

B : Vertically unstable

C : Rotationally stable

D : Rotationally unstable

Q : 7) The centre of pressure will coincide with the centre of gravity if a plane surface is-

A : Vertical

B : Horizontal

C : Immersed in a gas

D : None of the above

Q : 8) A block of wood 2 m long, 2 m wide and 1 m deep is floating horizontally in water. If density of wood is 800 kg/m^3, then the volume of water displaced will be-

A : 3.2 m^3

B : 2.6 m^3

C : 2 m^3

D : 6 m^3

Q : 9) The vertical depth of the centre of pressure, $\overline{h}$ for the inclined plane surface below the free surface of the liquid is

A : $\overline{x} = \frac{I_G sin\theta}{A}$

B : $\overline{x} = \frac{I_G sin^2\theta}{A\overline{x}^2}$

C : $\overline{x} = \frac{I_G sin^2\theta}{A\overline{x}}$

D : $\overline{x} = \frac{I_G sin^2\theta}{A}$

Q : 10) Cavitation will take place if the pressure of the following fluid at any points is

A : More than vapour pressure of the fluid

B : Equal to vapour pressure of the fluid

C : Less than vapour pressure of the fluid

D : None of the above

Q : 11) Match List I with List II and select the correct answer using the codes given below the lists:

A : ii, i, iv, iii

B : I, ii, iv, iii

C : ii, i, iii, iv

D : I, ii, iii, iv

List I	List II
A. Kaplan turbine	i. Works at atmospheric pressure
B. Pelton wheel	ii. High-part load efficiency
C. Axial flow pumps	iii. High-part load efficiency
D. Draft tube	iv. High value of N_S

Q : 12) Draft tube for a reaction turbine is arranged for

A : Safety purpose only

B : Increasing velocity head

C : Converting kinetic head into pressure head

D : Diverting water only

Q : 13) Which hydraulic turbine more efficient at part load operation?

A : Pelton wheel

B : Francis turbine

C : Propeller turbine

D : Kaplan turbine

Q : 14) In impulse turbine the total energy at inlet is

A : Pressure energy and kinetic energy

B : Pressure energy

C : Kinetic energy

D : Mechanical energy

Q : 15) To avoid cavitation in reaction turbine

A : The minimum pressure in the passage of a flow should always be more than the vapour pressure of the water at the working temperature

B : The velocity should be high

C : The discharge should be constant

D : The speed of turbine should be less that runaway speed

Q : 16) The specific speed of a turbine is the speed of an imaginary turbine, identical with the given turbine, which?

A : Delivers unit discharge under unit head

B : Delivers unit discharge under unit speed

C : Develops unit power under unit head

D : Develops unit power under unit speed

Q : 17) The overall efficiency of a Pelton turbine is 70%. If the mechanical efficiency is 85%, what is its hydraulic efficiency?

A : 82.4%

B : 59.5%

C : 72.3%

D : 81.5%

Q : 18) In a reaction turbine, the draft tube is used

A : To run the turbine full

B : To prevent air to enter the turbine

C : To increase the effective head of water

D : To transport water to downstream

Q : 19) In an inward flow reaction turbine

A : The water flows parallel to the axis of the wheel

B : The water enters at the centre of the wheel and from there flows towards the outer periphery of the wheel

C : The water enters the wheel at outer periphery, and then flows towards the centre of the wheel

D : The flow of water is partly radial and partly axial

Q : 20) In a Kaplan turbine runner, the number of blades are generally

A : 2 to 4

B : 4 to 8

C : 8 to 6

D : 16 to 24

Q : 21) The power developed by a turbine is

A : Directly proportional to $H^{1/2}$

B : Inversely proportional to $H^{1/2}$

C : Directly proportional to $H^{3/2}$

D : Inversely proportional to $H^{3/2}$

Q : 22) The turbine to be used for 450 m head of water is

A : Pelton wheel

B : Francis turbine

C : Kaplan turbine

D : None of these

Q : 23) The cavitation in a hydraulic machine

A : Causes noise and vibration of various parts

B : Makes the surface rough

C : Reduces the discharge of a turbine

D : Causes sudden drop in power output and efficiency

Q : 24) If a multi-jet Pelton turbine has 'n' number of jets, then its specific speed is directly proportional to

A : n^0

B : $n^{3/4}$

C : $n^{1/2}$

D : n

Q : 25) Rainfall of intensity 0.2 m/hr fell on 2.0 km^2 area for 4 hrs. Measured runoff during the period was 2,500,870 m^3. What was the loss in total during the period:

A : 440,386 m^3

B : 900,870 m^3

C : 540,246 m^3

D : 1,230,4188 m^3

Q : 26) The rainfall in three rain gauge stations P, Q and R in a catchment are 6, 8 and 10 cm, respectively. The Theissen polygonal areas of these three rain gauges are respectively 100, 200 and 200 m^2. The average depth of rainfall over the catchment would be

A : 6.5 cm

B : 8 cm

C : 8.5 cm

D : 9.2 cm

Q : 27) The mass curve of rainfall for a duration of 100 minutes is given below.

Estimated the maximum intensity of rainfall for 20 minute duration of the storm.

A : 51 mm/h

B : 14 mm/h

C : 21 mm/h

D : 42 mm/h

Time from start of rain (minute)	Cumulative rainfall (mm)
0	0
20	5
40	12
60	26
80	32
100	35

Q : 28) A rain gauge recorded hourly rainfall as 5 cm, 2 cm, 4 cm and 3 cm for a four hour storm respectively. If the ϕ index was 3 cm/hour, the total direct runoff from a catchments for the storm was

A : 14 cm

B : 12 cm

C : 3 cm

D : 2 cm

Q : 29) A 6 hr storm with a uniform intensity of 1.5 cm/hr produced a runoff depth of 72 mm. The average infiltration rate during this storm is

A : 3 mm/hr

B : 6 mm/hr

C : 9 mm/hr

D : 12 mm/hr

Q : 30) A 6 hr storm with hourly intensities of 7, 18, 25, 12, 10 and 3 mm/hr produced a runoff of 33 mm. Then the ϕ-index is

A : 7 mm/hr

B : 3 mm/hr

C : 10 mm/hr

D : 8 mm/hr

Q : 31) Infiltration is the

A : Movement of water through the soil

B : Absorption of water by soil surface

C : Both (a) and (b)

D : None of these

Q : 32) What does the term ‘unit’ in Unit Hydrograph signify?

A : Unit discharge

B : Unit precipitation

C :Unit duration of precipitation

D : Unit area of basin

Q : 33) The theory of infiltration capacity was given by:

A : W.W. Horner

B : Merrill Bernard

C : Le-Roy K. Sherman

D : Robert E. Horton

E: Karl von Terzaghi

Q : 34) The variation of rainfall between two sections in isohyetal method is assume as

A : Linear

B : Parabolic

C : Elliptical

D : Quadratic

Q : 35) How many major river basins does India have?

A : 13

B : 15

C : 10

D : 12

Q : 36) Hydrologic system contains:

A : Atmospheric water system

B : Surface water system

C : Sub surface water system

A: Only A and B are correct

B: Only B and C are correct

C: All A, B and C are correct

D: Only A and C are correct

Q : 37) Isohyets are

A : Area of equal elevation

B : Line of equal precipitation

C : Line of equal temperature

D : Line of equal pressure

Q : 38) The process by which the rain water enters the surface of the earth is called

A : Percolation

B : Infiltration

C : Seepage

D : Absorption

Q : 39) Y-axis of hydrograph indicates

A : Rainfall

B : Runoff

C : Discharge

D : Infiltration

Q : 40) A 6 h storm had 6 cm of rainfall and the resulting runoff was 3 cm if the ϕ-index remains at the same value, the runoff dur to 12 cm rainfall in 9 h in the catchment is

A : 9.0 cm

B : 4.5 cm

C : 6.0 cm

D : 7.5 cm

Q : 41) A hydrograph is a plot of

A : Precipitation against time

B : Direct run-off against time

C : Stream flow against time

D : Surface run-off against time

Q : 42) The diameter of a tapering rod varies from ‘D’ to D/2’ in length of ‘L’ m. If it is subjected to an axial tension pf ‘P’ the change in length is

A : $4PL/(\pi ED^2)$

B : $8PL/(\pi ED^2)$

C : $2PL/(\pi ED^2)$

D : None of the given answers

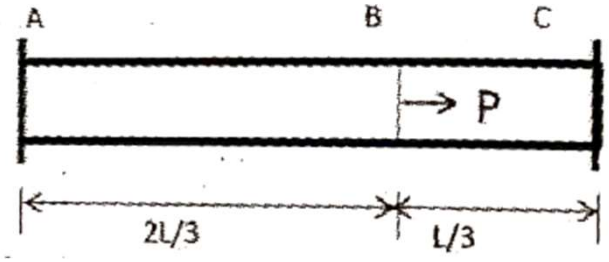
Q : 43) The ratio of loads shared by parts 'AB' and 'BC' of the bar shown below is

A : 1 : 1

B : 2 : 1

C : 3 : 1

D : 1 : 2



Q : 44) Two bars of same area and length but of different materials are subjected to same tensile force. If the bars have their axial elongation in the ratio of 4:6, then the ratio of modulus of elasticity of the two materials would be

A : 4 : 6

B : 6 : 4

C : 2 : $\sqrt{6}$

D : $\sqrt{6}$: 2

Q : 45) A brass tube has enclosed a steel bar and they have equal cross-sectional area. The Young's modulus of elasticity is 200 GPa and 100 GPa for steel and brass respectively. Then the ratio of stress developed in the steel bar to that in the brass tube under compression is

A : 0.5

B : 1

C : 1.5

D : 2

Q : 46) The principle of super position is valid only for

A : Any elastic materials

B : All metals

C : Linear elastic materials

D : Homogeneous materials

Q : 47) The value of Poisson's ratio for which bulk modulus of a material will be equal to its Young's modulus

A : 0.33

B : 0.15

C : 0.45

D : 0.25

Q : 48) A steel bar is heated from 20^0C to 35^0C and it is free to expand. Then bar will have

A : No stress

B : Tensile stress

C : Compressive stress

D : Shear stress

Q : 49) A beam of uniform strength refers t which one of the follows?

A : A beam in which extreme fibre stresses are same at all cross-sections along the length of the beam

B : A beam in which the moment of inertia about the axis of bending is constant at all cross-section of the beam

C : A beam in which the distribution of bending stress across the depth of cross-section if uniform at all cross-sections of the beam

D : A beam in which the bending stress is uniform at the maximum bending moment croess-section

Q : 50) In fixed beam (fixed supports at both ends) having 'l' span with 'w' as uniformly distributed loads, acting in downward direction, then fixed end bending moment at supports is _____

A : $\frac{wl^2}{12}$

B : $\frac{wl^2}{8}$

C : $\frac{wl^3}{12}$

D : $\frac{wl^8}{12}$

Q : 51) A fixed beam AB of span L is subjected to a clockwise moment M at a distance 'a' from end A. Fixed end moment at end A will be:

A: $\frac{M}{L^2}(L-a)(L-3a)$

B: $\frac{M}{L^2}\,a(2L-3a)$

C: $\frac{M}{L^2}\,a(L-a)$

D: $\frac{M}{L^2}(L-a)(2L-a)$

Q : 52) A moment M is applied at the propped end of a propped cantilever beam of span l and flexural rigidity EI. The moment at fixed end is

OR

If a moment is applied to the hinged end of a prismatic propped cantilever, then the moment at the fixed will be

A: $\frac{M}{2}$

B: $\frac{M}{3}$

C: $\frac{M}{4}$

D: M

Q : 53) A fixed beam is loaded as in figure. The fixed end moment at support A is

A: $\frac{wL^2}{30}$

B: $\frac{wL^2}{20}$

C: $\frac{wL^2}{10}$

D: $\frac{wL^2}{8}$