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Fluid Science and Engineering

1. Viscosity is
(*a*) an extensive property
(*b*) an intensive property
(*c*) an independent property
(*d*) a chemical property

2. Force exerts on a body flowing through fluid in the direction of flow is
(*a*) drag force
(*b*) buoyancy force
(*c*) pressure force of fluid
(*d*) all of the above

3. Viscosity of fluid is due to
I. cohesion
II. molecular momentum
III. adhesion
IV. shear stress due to change in velocity
Find the answer
(*a*) sl. no. I, III, IV
(*b*) sl. no. I, II, IV
(*c*) sl. no. I, IV
(*d*) sl. no. I, III

4. S.I. unit of Absolute Viscosity is
(*a*) N/m^2 (*b*) Pa.sec
(*c*) N-m/sec (*d*) m^2/sec

5. Capillary inversion when liquid jet pass through
(*a*) pipe
(*b*) venturi meter
(*c*) round orifice meter
(*d*) elliptical orifice meter

6. S.I. unit of kinematic viscosity is
(*a*) N/m^2 (*b*) Pa.sec
(*c*) N-m/sec (*d*) m^2/sec

7. Capillary inversion used in
(*a*) paint industry
(*b*) bottling industry
(*c*) insecticides industry
(*d*) both (*a*) and (*c*)

8. For dilatants apparent viscosity
(*a*) decrease with rate of deformation
(*b*) increase with rate of deformation
(*c*) constant with rate of deformation
(*d*) irregular with rate of deformation

9. Toothpaste is an example of
(*a*) bingham plastics
(*b*) pseudo plastic
(*c*) dilatants
(*d*) newtonian

10. Which of the following factor have maximum effect on absolute viscosity of fluid
(*a*) pressure (*b*) temperature
(*c*) density (*d*) volume

11. S.I. unit of surface energy is
(*a*) Joule/m (*b*) $Joule/m^2$
(*c*) N/m (*d*) N-m/m

12. Shape of rain drops is spherical due to
(*a*) gravity
(*b*) low surface energy per unit area
(*c*) surface tension
(*d*) high surface energy per unit area

13. Insects could walk on water due to
(*a*) cohesive force
(*b*) adhesive force
(*c*) surface tension
(*d*) shape of leg of insects

14. For pure water angle of contact is
(*a*) > 10° (*b*) = 0°
(*c*) < 90° (*d*) = 90°

15. At critical temperature of water, surface tension
(*a*) < 1 (*b*) > 1
(*c*) 0
(*d*) None of the above

16. Bulk modulus of elasticity is
(*a*) Compressive stress/volumetric stress
(*b*) Compressive stress/volumetric strain
(*c*) Compressive strain/volumetric stress
(*d*) Compressive strain/volumetric strain

17. Capillary effect is due to
(*a*) surface tension (*b*) viscosity
(*c*) cohesive force only
(*d*) adhesive force only

18. Meniscus in capillary tube is
(*a*) concave surface of liquid
(*b*) convex surface of liquid
(*c*) curved free surface of liquid
(*d*) surface of tube from where capillary actions start

19. Volume expansion coefficient (β) is
(*a*) $-(d\rho/\rho)/\Delta T$ at const. pressure
(*b*) $-(d\rho/\rho)/\Delta T$ at const. volume
(*c*) $-(dV/V)/\Delta P$ at const. temperature
(*d*) $-(d\rho/\rho)/\Delta P$ at const. volume.

20. Isothermal compressibility ($\propto$) is
(*a*) $1/\rho\ (d\rho/dP)$ at const. pressure
(*b*) $1/\rho\ (d\rho/dP)$ at const. temperature
(*c*) $1/P\ (d\rho/dP)$ at const. temperature
(*d*) $1/\rho\ (dP/d\rho)$ at const. temperature

21. Bulk modulus of elasticity of fluid is
(*a*) increases with increase in pressure
(*b*) decreases with increase in pressure
(*c*) increases with decrease in volume
(*d*) both (*a*) and (*c*)

22. Capillary action is negligible when diameter of pipe is
(*a*) > 15 mm (*b*) > 10 mm
(*c*) > 5 mm (*d*) < 10 mm

23. To reduce capillary action of manometer
(*a*) diameter of tube increase
(*b*) length of tube is increase
(*c*) diameter of tube decrease
(*d*) length of tube is decrease

24. Bulk modulus of elasticity is defined as
(*a*) $-V\ (dP/dV)$ at const. temperature
(*b*) $-P\ (dP/dV)$ at const. temperature
(*c*) $-(dV/V)/\Delta P$ at const. temperature
(*d*) $-(d\rho/\rho)/\Delta T$ at const. pressure

25. Vapor pressure behave with temperature as
(*a*) increases with decrease in temperature
(*b*) increases with increase in temperature
(*c*) decreases with increase in temperature
(*d*) its fixed at constant atm pressure

26. A liquid will wet the surface when
(*a*) $\Phi > 90°$ (*b*) $\Phi = 90°$
(*c*) $\Phi < 90°$ (*d*) $\Phi > 120°$

27. A liquid will wet the surface when
(*a*) $\Phi > 90°$ (*b*) $\Phi = 90°$
(*c*) $\Phi < 90°$ (*d*) $\Phi > 120°$

28. With increase in temperature viscosity of gas will
(*a*) decrease (*b*) increase
(*c*) remain same
(*d*) slightly decrease

29. Blood is an example of
(*a*) pseudo plastic fluid
(*b*) bingham fluid
(*c*) newtonian fluid
(*d*) dilatants fluid

30. Continuum is
(*a*) continuous, non homogeneous matter with no holes
(*b*) continuous, homogeneous matter with no holes
(*c*) continuous, non homogeneous matter with some holes
(*d*) random, homogeneous matter with no holes

31. For a Continuum properties could be taken as
(*a*) arbitrary function

(*b*) path function (*c*) point function

(*d*) none of the above

32. During measurement of Relative density, water density taken at

(*a*) 0°C (*b*) 4°C

(*c*) 15°C

(*d*) At any temperature < 100°C

33. Volume expansion coefficient (β) for an Ideal gas at T is

(*a*) $1/T$ (*b*) $1/T^2$

(*c*) $1/T^3$ (*d*) $1/\log T$

34. S.I. unit of kinematic viscosity is

(*a*) N/m^2 (*b*) Poise

(*c*) Stoke (*d*) M^3/sec^2

35. S.I. unit of dynamic viscosity is

(*a*) N/m (*b*) Poise

(*c*) Stoke (*d*) M^3/sec^2

36. S.I. unit of surface tension is

(*a*) N/m (*b*) J/m^2

(*c*) N/m^2 (*d*) $N\text{-}sec/m^2$.

37. Ratio of dynamic viscosity and kinematic viscosity is

(*a*) density (*b*) 1/density

(*c*) $density^2$ (*d*) Sp gr.

38. Followings is/are related with cavitations

(*a*) vapor pressure.

(*b*) pitting action

(*c*) both (*a*) and (*b*)

(*d*) none of the above

39. With increase in temperature Bulk modulus of elasticity of fluid is affected as

(*a*) for liquid it decrease and for gas it increase

(*b*) for liquid it increase and for gas it decrease

(*c*) for liquid it constant and for gas it increase

(*d*) for liquid it decrease and for gas it constant

40. Capillary rise (h)in glass tube is

(*a*) $4\Delta/\omega d$ (*b*) $4\Delta d/\omega$

(*c*) $4\Delta/\omega$ (*d*) $2\Delta/\omega d$

41. Dimensional formula of surface tension is

(*a*) $M L^0 T^2$ (*b*) $M L^0 T^{-2}$

(*c*) $M L^2 T^{-2}$ (*d*) $M^2 L^0 T^{-1}$

42. Manometer used to measure

(*a*) moderate and large pressure difference

(*b*) small and big pressure difference

(*c*) moderate and small pressure difference

(*d*) any range of pressure difference

43. Characteristics of pressure at any point in fluid is

(*a*) same in different direction

(*b*) different in different direction

(*c*) same in opposite direction only

(*d*) same in perpendicular direction only

44. In pressure transducer pressure signal convert to

(*a*) mechanical deformation

(*b*) electrical signal

(*c*) digital signal

(*d*) change in current only

45. Bourdon pressure gauge is

(*a*) mechanical type (*b*) electronic type

(*c*) digital type (*d*) solid state type

46. Most common type mechanical pressure gauge is

(*a*) bourdon tube pressure gauge

(*b*) bellow pressure gauge

(*c*) dead-weight pressure gauge

(*d*) not a specific one is an example

47. 1 Torr is

(*a*) 760 mm Hg (*b*) 10 mm Hg

(*c*) 1 mm Hg (*d*) 10 cm Hg

48. "Pressure in a point of a fluid remain constant in all directions" is law of

(*a*) pascal (*b*) archimedes

(*c*) torricelli (*d*) hoop

49. Buoyant force applied on a submerged body

(*a*) vertically upward

(*b*) vertically downward

(*c*) in all direction equally

(*d*) in horizontal direction

50. Stability of a floating body is measured by
(*a*) geocentric height
(*b*) meta centric height
(*c*) size and shape of the body
(*d*) all of the above

51. Restoring moment applied on body during
(*a*) stable position
(*b*) neutrally stable position
(*c*) unstable position
(*d*) meta stable position

52. When small angular displacement given to a floating body its starts oscillating about
(*a*) centre of pressure
(*b*) meta centre
(*c*) centre of gravity
(*d*) any one of above

53. When meta centric height is negative
(*a*) body cannot float vertically
(*b*) body can float vertically
(*c*) body should submerge vertically
(*d*) body can float horizontally

54. For small angle of tilt position of meta centre will
(*a*) change accordingly
(*b*) remains constant
(*c*) go downward (*d*) go upward

55. Total force on a curved surface area
(*a*) $P = \sqrt{P_H^2 + P_v^2}$ (*b*) $P = (P_H^2 + P_v^2)^{1/3}$
(*c*) $P = (P_H^2 + P_v^2)^{2/3}$ (*d*) $P = (P_H^2 + P_v^2)$

56. Centre of pressure (h) for an inclined immersed surface is
(*a*) $I_G \sin^2\theta/A + A\bar{x}$
(*b*) $I_G \sin\theta/\overline{Ax} + \bar{x}$
(*c*) $I_G \sin^2\theta/A\bar{x} + \bar{x}$
(*d*) $I_G \cos^2\theta/\overline{Ax} + \bar{x}$

57. A dam may fail due to
(*a*) sliding along its base
(*b*) shear at the weaker section
(*c*) over turning
(*d*) all of the above

58. Which of the following gate provide in cannel for navigation?
(*a*) lock gate
(*b*) sluice gate
(*c*) all the above
(*d*) no gate provided for navigation

59. Piezometer used to measure
(*a*) vacuum pressure and gauge pressure.
(*b*) vacuum pressure only
(*c*) gauge pressure only
(*d*) atmospheric pressure only

60. Piezometer used to measure
(*a*) large pressures in the lighter liquids
(*b*) gas pressure
(*c*) moderate pressure of fluids
(*d*) moderate pressure of liquids

61. For high accuracy measurement of pressure difference following is used
(*a*) inverted U-tube differential manometer
(*b*) U-tube differential manometer
(*c*) vertical single column manometer
(*d*) piezometer

62. Which one is correct
(*a*) $P_{abs} = P_{atm} - P_{gauge}$
(*b*) $P_{abs} = P_{atm} - P_{vacuum}$
(*c*) $P_{abs} = P_{atm} + P_{vacuum}$
(*d*) $P_{gauge} = P_{atm} - P_{abs}$

63. To describe motion of a fluid particle one should concentrate on the movement of a single particle in
(*a*) eulerian method
(*b*) laplace method
(*c*) langrangian method
(*d*) both (*b*) and (*c*)

64. To describe motion of a fluid particle one should concentrate on a point in the fluid system
(*a*) eulerian method
(*b*) bernoulli's method
(*c*) langrangian method
(*d*) both (*a*) and (*b*)

65. The type of flow in which velocity of fluid does not change at a point with respect to time is called

(*a*) uniform flow (*b*) steady flow
(*c*) laminar flow
(*d*) incompressible flow

66. The type of flow in which velocity of fluid does not change at a given time with respect to space is called
(*a*) uniform flow (*b*) steady flow
(*c*) laminar flow
(*d*) incompressible flow

67. If $(\Delta V/\Delta S) = 0$ at constant time its indicates
(*a*) uniform flow
(*b*) non uniform flow
(*c*) laminar flow
(*d*) steady flow

68. Flow through a non-prismatic channel at constant flow rate is an example of
(*a*) uniform flow
(*b*) steady flow
(*c*) laminar flow
(*d*) incompressible flow

69. Flow through a reducer is an example of
(*a*) one dimensional flow
(*b*) two dimensional flows
(*c*) three dimensional flows
(*d*) multi dimensional flow

70. Flow through a prismatic pipe at constant flow rate is an example of
(*a*) uniform flow
(*b*) non uniform flow
(*c*) laminar flow
(*d*) steady flow

71. Flow through a straight prismatic pipe of fixed diameter is an example of
(*a*) uniform flow
(*b*) non uniform flow
(*c*) laminar flow
(*d*) steady flow

72. Flow through a prismatic pipe bend of fixed diameter is an example of
(*a*) uniform flow
(*b*) non uniform flow
(*c*) laminar flow
(*d*) steady flow

73. Flow through main stream of ganges river could be
(*a*) one dimensional flow
(*b*) two dimensional flows
(*c*) three dimensional flows
(*d*) multi dimensional flow

74. In laminar flow change of momentum is
(*a*) very high (*b*) very low
(*c*) zero
(*d*) none of the above

75. In high turbulent flow change of momentum is
(*a*) very high
(*b*) very low
(*c*) zero
(*d*) none of the above

76. Supersonic aerodynamic flow is an example of
(*a*) non-compressible flow
(*b*) compressible flow
(*c*) none of the above
(*d*) non predictable

77. Sub-sonic aerodynamic flow is an example of
(*a*) non-compressible flow
(*b*) compressible flow
(*c*) none of the above
(*d*) can't be predictable

78. Potential flow is
(*a*) steady and rotational
(*b*) unsteady and rotational
(*c*) steady and irrotational
(*d*) unsteady and irrotational

79. In stream line flow, stream line space related with its velocity as below
(*a*) stream line space $\propto$ stream line velocity
(*b*) stream line space $\propto$ 1/stream line velocity
(*c*) stream line space $\propto$ 1/stream line velocity^2
(*d*) stream line space $\propto$ stream line velocity^2

80. Flow through Pipe is laminar when Re is
(*a*) < 2500
(*b*) < 2000
(*c*) > 2000 but < 4000
(*d*) < 4000

81. Flow through pipe is turbulent when Re is
(*a*) < 2500 (*b*) < 2000
(*c*) < 4000 (*d*) > 4000

82. Flow through pipe is transitional when Re is
(*a*) < 2500 but > 1500
(*b*) < 2000
(*c*) > 2000 but < 4000
(*d*) > 4000

83. Streamline flow occur during
(*a*) uniform flow
(*b*) non uniform flow
(*c*) laminar flow
(*d*) unsteady flow

84. Converging of a stream line along a particular direction is indicates
(*a*) constant velocity flow in that direction
(*b*) decelerated flow in that direction
(*c*) accelerated flow in that direction
(*d*) none

85. Whose theorem could be used as alternative derivation in place of Reynolds transport theorem?
(*a*) Leibnitz method
(*b*) Laplace method
(*c*) Langrangian method
(*d*) both (*a*) and (*c*)

86. Stream tube should not have
(*a*) finite dimension
(*b*) flow parallel to stream line
(*c*) flow across the surface
(*d*) All of the above.

87. If streak line and path lines are originate at same point then they
(*a*) will coincide at a point
(*b*) not-coincide at a point
(*c*) may coincide at a point
(*d*) always they are parallel

88. Streak line and stream lines are different in
(*a*) uniform flow (*b*) steady flow
(*c*) unsteady flow (*d*) both (*a*) and (*b*)

89. In case of unsteady flow the streamline pattern
(*a*) may remain same
(*b*) will not remain same
(*c*) may or may not remain same
(*d*) always remain same

90. Vorticity is
(*a*) circular $\int V \cos \theta \, ds$
(*b*) circular $\int V \sin \theta \, ds$
(*c*) circular $\int V \operatorname{cosec} \theta \, ds$
(*d*) circular $\int S \cos \theta \, dv$

91. For an rotational flow
(*a*) vorticity is one
(*b*) vorticity is zero
(*c*) vorticity is < 1
(*d*) vorticity is > 0

92. Potential function is exist
(*a*) for irrotational flow only
(*b*) for both rotational and irrotational flow
(*c*) for rotational flow only
(*d*) not exist for both type of flow

93. Stream function is applicable to
(*a*) for irrotational flow only
(*b*) for both rotational and irrotational flow
(*c*) ffor rotational flow only
(*d*) not exist for both type of flow

94. Following relationship is hold good for
$u = -d\varphi/dx = d\psi/dy$; $v = -d\varphi/dy = d\psi/dx$
(*a*) rotational and compressible flow
(*b*) irrotational and compressible flow
(*c*) rotational and non compressible flow
(*d*) irrotational and non compressible flow

95. Stream line and equi potential line are
(*a*) parallel to each other
(*b*) perpendicular to each other
(*c*) intersect each other at any angle
(*d*) either parallel or perpendicular to each other

96. Stream line and equi potential line are
(*a*) parallel to each other
(*b*) intersect each other orthogonally
(*c*) intersect each other obliquely
(*d*) either parallel or perpendicular to each other

97. Flow net method is used to study
(*a*) one dimensional rotational flow
(*b*) two dimensional rotational flows
(*c*) three dimensional rotational flows
(*d*) two dimensional irrotational flows

98. Flow net use to analyze
(*a*) equipotential lines only
(*b*) streamlines only
(*c*) both (*a*) and (*b*)
(*d*) none of the above

99. Quantity of seepage below a hydraulic structure could be determine by
(*a*) flow net method
(*b*) laplace method
(*c*) langrangian method
(*d*) both (*a*) and (*b*)

100. Flow net method is used to study
(*a*) one dimensional rotational flow
(*b*) two dimensional rotational flows
(*c*) three dimensional rotational flows
(*d*) two dimensional positional flows

101. Bulk modulus of fluid is related with
(*a*) froude number
(*b*) mach number
(*c*) reynolds number
(*d*) euler's number

102. In case of streak-line for unsteady flow all particles are pass through
(*a*) common point
(*b*) one point to another
(*c*) zigzag path
(*d*) either (*a*) or (*b*)

103. Streak line and stream lines are different in
(*a*) uniform flow (*b*) steady flow
(*c*) unsteady flow (*d*) both (*a*) and (*b*)

104. In dynamic equation of fluid it assume as
(*a*) compressible and non-viscous
(*b*) incompressible and non-viscous
(*c*) compressible and viscous
(*d*) incompressible and viscous

105. Bernoulli's equation follow following principle
(*a*) conservation of linear momentum
(*b*) conservation of energy
(*c*) conservation of mechanical energy
(*d*) both (*a*) and (*c*)

106. Bernoulli's equation is applicable to
1. in-viscous fluid flow
2. compressible flow
3. incompressible flow
4. viscous fluid flow
5. steady flow
6. unsteady flow

Choose the answer:
(*a*) only (1)
(*b*) both (1), (3) and (5)
(*c*) both (2), (4) and (5)
(*d*) both (1), (2) and (6)

107. In Bernoulli's equation Pr. *E*, K.E. and Potential energy is constant across
(*a*) the stream line
(*b*) the perpendicular to stream line
(*c*) the equipotential line
(*d*) the velocity gradient

108. Which represents Euler's equation
(*a*) $dp/\rho + V/dV + g\,dZ = 0$
(*b*) $dp/\rho + V.dV + g\,/dZ = 0$
(*c*) $dp/\rho + VdV + g\,dZ = 0$
(*d*) $dp/p + V/dV + g\,dZ = 0$

109. Variation of pressure with elevation in steady, incompressible fluid flow in compare to same stationary fluid is
(*a*) same
(*b*) different
(*c*) varies exponentially
(*d*) varies logarithmically

110. For unsteady compressible flow the Bernoulli's equation is
(*a*) $P/\rho + V^2/2 + gz = 0$
(*b*) $\int dP/\rho + V^2/2 + gz = 0$
(*c*) $dp/\rho + VdV + g\,dZ = 0$
(*d*) $\int dP/\rho + \int dS * dV/dt + V^2/2 + gz = 0$

111. For steady flow the Bernoulli's equation is

(a) $P/\rho + V^2/2 + gz = 0$

(b) $\int dP/\rho + V^2/2 + gz = 0$

(c) $dp/\rho + VdV + g\,dZ = 0$

(d) $\int dP/\rho + \int dS^*dV/dt + V^2/2 + gz = 0$

112. For steady, incompressible flow the Bernoulli's equation is

(a) $P/\rho + V^2/2 + gz = 0$

(b) $\int dP/\rho + V^2/2 + gz = 0$

(c) $dp/\rho + VdV + g\,dZ = 0$

(d) $\int dP/\rho + \int dS^*dV/dt + V^2/2 + gz = 0$

113. Stagnation pressure is

(a) static pressure – dynamic pressure

(b) static pressure

(c) total pressure – dynamic pressure

(d) total pressure – hydrostatic pressure

114. Stagnation pressure represents as

(a) $P + \rho V/2$ (b) $P + \rho V^2/2$

(c) $P + \rho gh$ (d) $\rho gh + \rho V^2/2$

115. Total pressure represents as

(a) $P + \rho V^2/2$ (b) $\rho gh + \rho V^2/2$

(c) $P + \rho gh + \rho V^2/2$ (d) $P + \rho gh - \rho V^2/2$

116. Stagnation pressure is

(a) static pressure + Dynamic pressure

(b) static pressure

(c) static pressure + Hydrostatic pressure

(d) hydrostatic pressure + Dynamic pressure

117. Piezometer indicates

(a) stagnation pressure

(b) static pressure

(c) dynamic pressure

(d) hydrostatic pressure

118. Pitot tube indicates

(a) stagnation pressure

(b) static pressure

(c) dynamic pressure

(d) hydrostatic pressure

119. Difference between pitot tube and piezometer reading indicates

(a) stagnation pressure

(b) static pressure

(c) dynamic pressure

(d) hydrostatic pressure

120. Where stagnation pressure is more than atmospheric pressure there

(a) only pitot tube is used

(b) both piezometer and Pitot tube used

(c) only piezometer is used

(d) both static pressure tap and pitot tube can't be used

121. To measure stagnation pressure of flowing gas which one can't be use

(a) piezometer

(b) static pressure taps

(c) pitot tube

(d) both (a) and (c)

122. At stagnation point velocity of flowing fluid particle is

(a) maximum (b) minimum

(c) zero (d) none

123. During stagnation pressure measurement number of stagnation streamline appear in vertical plane is

(a) always one (b) always two

(c) more than one (d) infinite

124. Kinetic Energy correction factor (α) is

(a) ratio of K.E. per second based on actual velocity to Avg. velocity.

(b) ratio of K.E. per second based on avg. velocity to Actual velocity.

(c) ratio of K.E. per second based on actual velocity to P.E.

(d) ratio of K.E. per second based on avg. velocity to local velocity.

125. Hydraulic gradient Line represents

(a) static head + Dynamic head

(b) static head + Hydrostatic head

(c) hydrostatic + Dynamic head

(d) hydrostatic head only

126. For a two-dimensional flow stagnation point is a

(a) line only

(b) line parallel to Z-axis

(c) surface parallel to Z-axis

(d) none of the above

127. Energy gradient line represents
(*a*) static head + dynamic head
(*b*) static head + hydrostatic head
(*c*) static head + hydrostatic + dynamic head
(*d*) hydrostatic head only

128. Impulse momentum equation used in
(*a*) pipe bends (*b*) jet propulsion
(*c*) nozzle flow (*d*) both (*a*) and (*b*)

129. For a two-dimensional flow stagnation stream line is a
(*a*) line only
(*b*) surface parallel to Z-axis
(*c*) surface perpendicular to Z-axis
(*d*) none of the above

130. Along a stationary reservoir
(*a*) E.G.L. and H.G.L. are same on water surface.
(*b*) E.G.L. is below the surface but H.G.L. is along the surface.
(*c*) H.G.L. is below the surface but E.G.L. is along the surface.
(*d*) E.G.L. and H.G.L. both are same below the surface.

131. Pitot static tube used to measure
(*a*) static pressure only
(*b*) stagnation pressure only
(*c*) both (*a*) and (*b*)
(*d*) dynamic pressure only

132. Distance between E.G.L. and H.G.L. is always
(*a*) hydrostatic head
(*b*) dynamic head
(*c*) static head
(*d*) stagnation pressure head

133. EGL is always
(*a*) above H.G.L.
(*b*) below H.G.L.
(*c*) either above or below H.G.L.
(*d*) coincide with H.G.L.

134. In an Open channel flow
(*a*) H.G.L. is on the free surface but E.G.L. is above free surface at a distance of dynamic head of flow.
(*b*) E.G.L. is on the free surface but H.G.L. is above free surface at a distance of dynamic head of flow.
(*c*) E.G.L. and H.G.L. are same on water surface.
(*d*) H.G.L. is on the free surface but E.G.L. is below free surface at a distance of dynamic head of flow.

135. Throat ratio of a venturimeter is
(*a*) 0.25 – 0.66 (*b*) 0.2 – 0.75
(*c*) 0.25 – 0.75 (*d*) 0.5 – 0.75

136. Mass flux is
(*a*) mass flow rate per unit area
(*b*) mass flow rate
(*c*) mass flow per unit time
(*d*) all of the above

137. Co-efficient of venturimeter is
(*a*) $A_1/A_2\sqrt{A_1^3 - A_2^3} \times \sqrt{2gh}$
(*b*) $A_1A_2/\sqrt{A_1^3 - A_2^3} \times \sqrt{2gh}$
(*c*) $A_1A_2/\sqrt{A_1^2 - A_2^2} \times \sqrt{2gh}$
(*d*) $A_1/A_2\sqrt{A_1^2 - A_2^2} \times \sqrt{2gh}$

138. Co-efficient of venturimeter lies in the range of
(*a*) 0.91 – 0.95 (*b*) 0.96 – 0.98
(*c*) 0.9 – 0.98 (*d*) 0.6 – 0.9

139. If kinetic energy correction factor (α) is = 1 then flow is
(*a*) uniform flow (*b*) steady flow
(*c*) laminar flow (*d*) both (*a*) and (*c*)

140. If kinetic energy correction factor (α) is = 3 then flow is
(*a*) uniform flow (*b*) steady flow
(*c*) laminar flow (*d*) both (*a*) and (*c*)

141. If Kinetic Energy correction factor (α) is > 1 but < 3 then flow is
(*a*) non-uniform flow (*b*) turbulent flow
(*c*) laminar flow (*d*) both (*a*) and (*c*)

142. The pressure at a point in a fluid section that lies above H.G.L. of flow is
(*a*) always positive (*b*) always negative

(*c*) either positive or negative which depends on viscosity of fluid

(*d*) zero

143. Gauge pressure at the point where H.G.L. cut fluid flow line

(*a*) is negative (*b*) is zero

(*c*) is positive

(*d*) is either positive or negative

144. Diameter of orifice/diameter of pipe is mainly lies between

(*a*) 0.3 – 0.9 (*b*) 0.4 – 0.7

(*c*) 0.4 – 0.85 (*d*) 0.5 – 0.85

145. Which of the following could be used for measuring flow of fluids

(*a*) venturi meter (*b*) orifice meter

(*c*) both (*a*) and (*b*) (*d*) pitot static tube

146. Small or large Orifice is classified by means of

(*a*) depth of orifice only

(*b*) head above the centre of the orifice only

(*c*) discharge flow rate

(*d*) both (*a*) and (*b*)

147. Which of the following could be used for measuring flow of liquids only

(*a*) orifice meter (*b*) pitot static tube

(*c*) both (*a*) and (*b*) (*d*) venturi meter

148. Net force acting on a mass of fluid is equal to

(*a*) $d\,(mv)/dt$ (*b*) $d\,(I\omega)/dt$

(*c*) $d\,(mv)/dt$ and $d\,(I\omega)/dt$

(*d*) change in velocity of that mass

149. Momentum correction factor (β) is

(*a*) linear momentum per second based on actual velocity to avg. velocity.

(*b*) angular momentum per second based on actual velocity to avg. velocity.

(*c*) angular momentum per second based on avg. velocity to Actual velocity.

(*d*) linear momentum per second based on avg. velocity to actual velocity.

150. If momentum correction factor (β) is = 1 then flow is

(*a*) uniform flow (*b*) steady flow

(*c*) laminar flow (*d*) both (*a*) and (*c*)

151. If momentum correction factor (β) is = 4/3 then flow is

(*a*) uniform flow (*b*) steady flow

(*c*) laminar flow (*d*) both (*a*) and (*c*)

152. Momentum correction factor (β) is related as

(*a*) open channel flow > flow through pipe

(*b*) open channel flow < flow through pipe

(*c*) open channel flow = flow through pipe

(*d*) no specific relation is existing

153. Rotameter is also called

(*a*) constant area flow meter

(*b*) variable area flow meter

(*c*) parabolic area flow meter

(*d*) reducing area flow meter

154. Coriolis coefficient is also called

(*a*) momentum correction factor

(*b*) kinetic energy correction factor

(*c*) dynamic head correction factor

(*d*) both (*b*) and (*c*)

155. Free vortex also called

(*a*) irrotational vortex

(*b*) rotational vortex

(*c*) potential vortex

(*d*) both (*a*) and (*c*)

156. Force vortex also called

(*a*) irrotational vortex

(*b*) rotational vortex

(*c*) potential vortex

(*d*) both (*a*) and (*c*)

157. Energy correction factor (∝) could be represent as

(*a*) $1/A \int (u/\bar{u})^3\, dA$ (*b*) $A \int (u/\bar{u})^3\, dA$

(*c*) $\int (\bar{u}/u)^3\, dA/A$ (*d*) $1/A \int (u/\bar{u})^2\, dA$

158. Momentum correction factor (β) could be represent as

(*a*) $1/A \int (u/\bar{u})^3\, dA$ (*b*) $A \int (u/\bar{u})^3\, dA$

(*c*) $\int (\bar{u}/u)^3\, dA/A$ (*d*) $1/A \int (u/\bar{u})^2\, dA$

159. Drop of liquid level at centre when closed sealed cylinder rotate about its axis is d =

(*a*) $\omega^2 R^2/g$ (*b*) $\omega^2 R^2/2g$

(*c*) $\omega^2 R/2g$ (*d*) $2\omega^2 R^2/g$

160. Whirlpool in a river is an example of
(*a*) irrotational vortex
(*b*) rotational vortex
(*c*) potential vortex
(*d*) both (*a*) and (*c*)

161. Whirlpool in a washing machine without cloth is an example of
(*a*) irrotational vortex
(*b*) rotational vortex
(*c*) potential vortex
(*d*) both (*a*) and (*c*)

162. Free surface during vortex is example of
(*a*) paraboloid (*b*) cylindrical
(*c*) ellipsoid (*d*) hyperboloid

163. Elbow meter used to measure
(*a*) flows at pipe bend
(*b*) flow at horizontal pipe section
(*c*) flow at vertical pipe section
(*d*) flow at any position in pipe

164. Shape of orifice depends on shape of
(*a*) downstream edge
(*b*) upstream edge
(*c*) both (*a*) and (*b*)
(*d*) shape of water flow outlet

165. Vena contracta found in flow path of
(*a*) orifice (*b*) mouthpiece
(*c*) nozzle (*d*) all of the above

166. Pressure head at Vena Contracta compared to atmospheric is
(*a*) high (*b*) low
(*c*) same
(*d*) higher or lower depends on shape of edge

167. At vena contracta velocity head is
(*a*) maximum (*b*) minimum
(*c*) not change
(*d*) change very slightly

168. At Vena Contracta Pressure head is
(*a*) minimum (*b*) zero
(*c*) less than atmospheric pressure
(*d*) not change

169. For same size discharge is maximum for following orifice
(*a*) sharp edge orifice
(*b*) bell-mounted orifice
(*c*) square orifice
(*d*) not defined

170. Friction loss is minimum for which orifice?
(*a*) sharp edge orifice
(*b*) bell-mounted orifice
(*c*) square orifice (*d*) not defined

171. Torricelli's equation is
(*a*) $2g\sqrt{h}$ (*b*) $\sqrt{2gh}$
(*c*) $2\sqrt{gh}$ (*d*) $\sqrt{gh}$

172. Which of the following has maximum value
(*a*) coefficient of discharge
(*b*) coefficient of velocity
(*c*) coefficient of contraction
(*d*) coefficient of resistance

173. Which of the following has maximum value
(*a*) coefficient of discharge (C_d)
(*b*) coefficient of velocity (C_v)
(*c*) coefficient of contraction (C_c)
(*d*) coefficient of resistance (C_r)

174. Which one is correct?
(*a*) $C_v > C_c > C_d$ (*b*) $C_c > C_d \geq C_v$
(*c*) $C_d \leq C_v > C_c$ (*d*) $C_v = C_c > C_d$

175. In a running full internal mouthpiece
(*a*) diameter of jet is less than diameter of mouthpiece.
(*b*) diameter of jet is more than diameter of mouthpiece.
(*c*) diameter of jet is equal to the diameter of mouthpiece.
(*d*) no definite relation is there.

176. In a running free internal mouthpiece
(*a*) diameter of jet is less than diameter of mouthpiece.
(*b*) diameter of jet is more than diameter of mouthpiece.
(*c*) diameter of jet is equal to the diameter of mouthpiece.
(*d*) no definite relation is there.

177. Borda's mouthpiece is an example of
(*a*) external mouthpiece
(*b*) internal mouthpiece
(*c*) external convergent-divergent mouthpiece
(*d*) internal running free mouthpiece

178. Re-entrant mouthpiece is an example of
(*a*) external mouthpiece
(*b*) internal mouthpiece
(*c*) external convergent-divergent mouthpiece
(*d*) internal running free mouthpiece

179. Borda's mouthpiece will be running full type if length of tube is
(*a*) 3.5 times of its diameter
(*b*) 2.5 times of its diameter
(*c*) 3.0 times of its diameter
(*d*) 5 times of its diameter

180. Coefficient of discharge for running free is
(*a*) less than running full mouthpiece
(*b*) more than running full mouthpiece
(*c*) equal to running full mouthpiece
(*d*) it also depends on other parameters

181. Discharge through a mouthpiece compared to orifice (for same size) is
(*a*) always low (*b*) always high
(*c*) always same (*d*) slightly less

182. Discharge through mouthpiece is more compared to orifice (for same size) due to
(*a*) decrease of pressure at vena contracta is higher.
(*b*) decrease of pressure at vena contracta is lower.
(*c*) decrease of velocity at vena contracta is higher.
(*d*) less frictional loss in mouthpieces.

183. The flow velocity found by Torricelli's equation is
(*a*) average velocity
(*b*) actual velocity
(*c*) theoretical velocity
(*d*) R.M.S. velocity

184. For sharp edge orifice C_v is
(*a*) 0.95 to 0.98 (*b*) 0.65 to 0.77
(*c*) 0.61 to 0.70 (*d*) 0.90 to 0.92

185. Weir and Notches are different according to
(*a*) rate of flow
(*b*) position with respect to surface of tank
(*c*) water surface level with respect to upper edge
(*d*) size

186. Orifice and Notches are different according to
(*a*) rate of flow
(*b*) position with respect to surface of tank
(*c*) water surface level with respect to upper edge
(*d*) size

187. Nappe is
(*a*) top of weirs over which water flows.
(*b*) bottom surface of water sheet flows over the weirs.
(*c*) sheet of water flowing over Weirs.
(*d*) sheet of water reaches the weir before it flows over it.

188. Crest is
(*a*) top of weirs over which water flows.
(*b*) bottom surface of water sheet flows over the weirs.
(*c*) sheet of water flowing over weirs.
(*d*) sheet of water reaches the weir before it flows over it.

189. Most accurate Notch for low flow measurement is
(*a*) rectangular notch
(*b*) triangular notch
(*c*) cippoletti notch
(*d*) steeped notch

190. Wide range of flow accurately measure by
(*a*) rectangular notch
(*b*) triangular notch
(*c*) cippoletti notch
(*d*) steeped notch

191. Discharge flow measurement will be more erroneous for same error in measurement of head is
(*a*) rectangular notch
(*b*) triangular notch
(*c*) trapezoidal notch
(*d*) steeped notch

192. Error in discharge measurement will how much for every % error in head measurement in a rectangular weir
(*a*) 2.5% (*b*) 1.5%
(*c*) 0.15% (*d*) 0.25%

193. Velocity of approach
(*a*) decrease discharge rate
(*b*) increase discharge rate
(*c*) does not have any effect on discharge rate
(*d*) none of the above

194. Cippoletti wire is one kinds of
(*a*) rectangular weir
(*b*) triangular weir
(*c*) trapezoidal weir
(*d*) trapezoidal weir with special ratio of slant edge and height

195. For suppressed weir crest length is
(*a*) wqual to width of the channel
(*b*) 0.5 times width of the channel
(*c*) 2 times width of the channel
(*d*) 5 times width of the channel

196. End contraction will
(*a*) decrease discharge rate
(*b*) increase discharge rate
(*c*) does not have any effect on discharge rate
(*d*) none of the above

197. According to whose formula end contraction should be consider for discharge measurement through weir
(*a*) francis formula
(*b*) bazin's formula
(*c*) manning formula
(*d*) both (*a*) and (*b*)

198. Head added due to approach velocity is
(*a*) V_a^2/g (*b*) $V_a^2/2g$
(*c*) $V_a/2g$ (*d*) $2V_a^2/g$

199. Due to end contraction
(*a*) effective length decrease.
(*b*) effective length may increase or decrease and its depends on its shape.
(*c*) effective length increase.
(*d*) effective length will not affect.

200. Due to end contraction
(*a*) effective length overall decrease 10%.
(*b*) effective length may increase or decrease and its depends on its shape.
(*c*) effective length overall increase 20%.
(*d*) effective length overall decrease 20%.

201. End contraction is not applicable (while Francis's formula use (*d*) to
1. cippoletti weir
2. triangular weir
3. rectangular weir
4. suppressed triangular weir
5. non-suppressed trapezoidal weir
6. suppressed trapezoidal weir

Select answer:
(*a*) sl. no. 1
(*b*) sl. no. 1, 4 and 6
(*c*) sl. no. 1, 3 and 6
(*d*) sl. no. 2, 3 and 5

202. Error in discharge measurement will be more for every % error in Head measurement is for
(*a*) rectangular notch
(*b*) triangular notch
(*c*) both are same for (*a*) and (*b*)
(*d*) always for rectangular notch it is maximum.

203. For a Narrow crested weir
(*a*) $2L < H$ (*b*) $2L > H$
(*c*) $2L \geq H$ (*d*) $2L = H$

204. Discharge over Narrow Crested wire is equal to
(*a*) discharge over Ogee weir
(*b*) discharge over rectangular weir
(*c*) discharge over Cippoletti weir
(*d*) both (*a*) and (*b*)

205. Magnitude of pressure raise during water hammer depends on
1. closing speed of valve
2. diameter of pipe
3. velocity of liquid flow
4. density of liquid
5. elastic property of pipe material
6. Compressibility of liquid

Choose answer:
(*a*) sl. no. 1, 2, 3 and 5
(*b*) sl. no. 1, 3 and 5
(*c*) sl. no. 1, 2, 3 and 4
(*d*) sl. no. 1, 2 and 6

206. Valve closure will be called as gradual closure when
(*a*) $T > 2L/V$ (*b*) $T \geq 2L/V$
(*c*) $T < 2L/V$ (*d*) $T \leq 2L/V$
where T is time, L is length of pipe and V is velocity of pressure wave

207. Power transmitted through a pipe will be maximum when ratio of head of water flow and loss of head due to friction inside pipe is
(*a*) 4 (*b*) 1/3
(*c*) 3 (*d*) 2/3

208. Dupit's equation is
(*a*) $L/D^5 = L_1/D_1^5 + L_2/D_2^5 + L_3/D_3^5$
(*b*) $L/D^3 = L_1/D_1^3 + L_2/D_2^3 + L_3/D_3^3$
(*c*) $L/D = L_1/D_1 + L_2/D_2 + L_3/D_3$
(*d*) $L/D_2 = L_1/D_1^2 + L_2/D_2^2 + L_3/D_3^2$

209. In Chezy's equation $V = C\,(\text{mi})^{1/2}$
(*a*) here V is maximum velocity
(*b*) here V is minimum velocity
(*c*) here V is mean velocity
(*d*) RMS of above three types of velocity

210. A line is drawn joining the piezometric levels at various points represents
(*a*) total energy line
(*b*) hydraulic gradient line
(*c*) total head line
(*d*) mean gradient line

211. Difference between E.G.L. and H.G.L. is
(*a*) velocity head (*b*) pressure Head
(*c*) elevation Head (*d*) both (*a*) and (*b*)

212. A pipe with uniform cross-section the slope of the hydraulic gradient line is
(*a*) more than energy gradient line
(*b*) less than energy gradient line
(*c*) equal to energy gradient line
(*d*) it may cross each others

213. In Chezy's equation $V = C\,(mi)^{1/2}$
(*a*) here V is maximum velocity
(*b*) here V is minimum velocity
(*c*) here V is mean velocity
(*d*) RMS of above three types of velocity

214. Turbulent flow is mainly due to
(*a*) momentum transfer
(*b*) velocity transfer
(*c*) energy transfer
(*d*) mass transfer

215. Velocity distribution is more uniform for
(*a*) laminar flow (*b*) viscous flow
(*c*) logarithmic flow (*d*) both (*b*) and (*c*)

216. Valve closure will be called as gradual closure when
(*a*) $T > 2L/V$ (*b*) $T \geq 2L/V$
(*c*) $T < 2L/V$ (*d*) $T \leq 2L/V$
Where T is time, L is length of pipe and V is velocity of pressure wave

217. Convective turbulence flow occur when
(*a*) K.E. is converted to P.E.
(*b*) P.E. is converted to K.E.
(*c*) Flow as jets
(*d*) there is a immediate vicinity of solid surface

218. Darcy-Weisbach equation is applicable to
(*a*) turbulent flow only
(*b*) laminar flow only
(*c*) all types of flow through channel
(*d*) all types of flow through pipes

219. Ratio of Hydraulic diameter to Hydraulic radius
(*a*) 2 (*b*) 0.5
(*c*) 4 (*d*) 0.25

220. Hydraulic mean depth is
(*a*) A^*P^{-1} (A = area of flow and P = wetted perimeter)
(*b*) AP (*c*) P/A
(*d*) $1/AP$

221. At Summit of siphon at what pressure dissolve gases would come out from water
(*a*) 10.3 meter water column
(*b*) 7.6 meter water column
(*c*) 2.4 meter water column
(*d*) 2.7 meter water column

222. Pressure loss at summit of syphone depends on
(*a*) out leg of syphone
(*b*) inlet leg of syphone
(*c*) both leg of syphone
(*d*) material of fluid

223. Maximum η at maximum power transmission by pipe is
(*a*) 66.7% (*b*) 75%
(*c*) > 90% (*d*) 0.33%

224. Diameter of Nozzle at maximum power transmission
(*a*) $(D^4/8\,fL)^{1/4}$ (*b*) $(D^5/8\,fL)^{1/4}$
(*c*) $(D^5/8\,fL)^{1/5}$ (*d*) $(D^2/8\,fL)^{1/5}$

225. Reynolds stress observed during
(*a*) laminar flow (*b*) viscous flow
(*c*) both (*a*) and (*b*)
(*d*) none of the above

226. Reynolds stress occur due to
(*a*) uniform orientation of fluid particles during flow.
(*b*) random orientation of fluid particles during flow.
(*c*) linear orientation of fluid particles during flow.
(*d*) zigzag orientation of fluid particles during flow.

227. Hydraulic mean depth is
(*a*) 1/2 × Diameter of pipe
(*b*) 1/4 × Radius of pipe
(*c*) 1/2 × Radius of pipe
(*d*) 1/4 × Diameter of pipe

228. Turbulent flown through the annular space is an example of
(*a*) wall turbulence
(*b*) convective turbulence
(*c*) free turbulence
(*d*) turbulence

229. Total shear stress in turbulent flow is
(*a*) shear stress due to viscosity + shear stress due to turbulence.
(*b*) shear stress due to viscosity – shear stress due to turbulence.
(*c*) shear stress due to turbulence – shear stress due to viscosity
(*d*) shear stress due to turbulence only.

230. Kinematic viscosity during turbulent flow is called
(*a*) kinematic eddy viscosity
(*b*) kinematic turbulent viscosity
(*c*) eddy diffusivity of momentum
(*d*) all of the above

231. Turbulent shear stress is proportional to
(*a*) R.M.S of the product of the fluctuating velocity components.
(*b*) average of the product of the fluctuating velocity components.
(*c*) line average of the product of the fluctuating velocity components.
(*d*) modulus of the product of the fluctuating velocity components.

232. Turbulent shear stress is equal to
(*a*) – ρ × Average of the product of the fluctuating velocity components.
(*b*) ρ × Average of the product of the fluctuating velocity components.
(*c*) sum of the product of the fluctuating velocity components.
(*d*) | ρ × Average of the product of the fluctuating velocity components. |

233. Mixing length theory introduced by
(*a*) prandtl law
(*b*) boussinesq's theory
(*c*) reynolds theory
(*d*) prandtl-Karman universal law

234. Entrance effect is insignificant after
(*a*) 10D (D is diameter of pipe)
(*b*) 5D
(*c*) Full length of pipe
(*d*) $1.359D \times Re^{1/4}$

235. For liquid flow circular flow section select due to

(*a*) this flow section is easily available as pipe.
(*b*) this cross section reduces pressure loss.
(*c*) this cross section is highly efficient for flow measurement.
(*d*) it could withstand large pressure difference of inside and outside without much distortion.

236. Hydraulic diameter of square duct is
(*a*) side of the square
(*b*) 2× side of the square
(*c*) 1/4 side of square
(*d*) 4 diagonal of square

237. Hydraulic diameter of pipe is
(*a*) diameter of pipe
(*b*) 2 × diameter of pipe
(*c*) 1/4 diameter of pipe
(*d*) 4 diameter of pipe

238. Critical Reynolds number depends on
(*a*) geometry of flow section only
(*b*) flow condition only
(*c*) flow condition and density of fluid
(*d*) both (*a*) and (*b*)

239. Critical Reynolds number for laminar flow through circular pipe section is
(*a*) ≤ 2300 (*b*) ≥ 4000
(*c*) ≤ 2000 (*d*) $\leq 3 \times 10^5$

240. Ratio of maximum and average velocity in case of laminar flow is
(*a*) 4 (*b*) 2
(*c*) 3 (*d*) 8

241. Darcy friction factor is
(*a*) $8\tau_w / \rho V_{avg}^2$ (*b*) $32\tau_w / \rho V_{avg}^2$
(*c*) $16\tau_w / \rho V_{avg}^2$ (*d*) $64\tau_w / \rho V_{avg}^2$

242. Which one is correct for fully developed laminar flow through pipe
(*a*) friction factor (f) = $32/Re$
(*b*) friction factor (f) = $16/Re$
(*c*) friction factor (f) = $64/Re$
(*d*) friction factor (f) = $8/Re$

243. During turbulent flow through pipe is assumed fully developed up to
(*a*) $10D$ (D is diameter of pipe)
(*b*) $5D$
(*c*) Full length of pipe
(*d*) $1.359D \times Re^{1/4}$

244. Friction factor for fully developed laminar flow through pipe
(*a*) depends on Re number only
(*b*) independent of Re number
(*c*) depends on Re number and roughness of pipe surface
(*d*) depends on roughness of surface only

245. Pumping power required for flow through pipe is
1. proportional to length of pipe
2. inversely proportional to viscosity of flowing fluid
3. proportional to viscosity of flowing fluid
4. inversely proportional to fourth power of the radius of pipe
5. proportional to fourth power of the radius of pipe
6. proportional to square of the length of pipe

Select answer:
(*a*) sl. no. 1, 3 and 4 (*b*) sl. no. 1, 2 and 4
(*c*) sl. no. 2, 5 and 6 (*d*) sl. no. 3, 4 and 6

246. For triangular duct friction factor will be maximum when it is
(*a*) isosceles triangle
(*b*) equilateral triangle
(*c*) right angle triangle
(*d*) obtuse angle triangle

247. Hydrodynamically developed flow is equivalent to fully developed flow when fluid in the pipe
(*a*) in thermal equilibrium
(*b*) in mechanical equilibrium
(*c*) got maximum speed
(*d*) in chemical equilibrium

248. In fully developed flow region wall shear stress
(*a*) changed steadily
(*b*) remain constant
(*c*) remains minimum
(*d*) changed randomly

249. At entrance region of a pipe flow pressure drop is

(*a*) very low (*b*) zero
(*c*) very high (*d*) negligible

250. Velocity profile in fully developed laminar flow is

(*a*) parabolic with max. at centre line and min. at pipe wall.
(*b*) parabolic with min. at centre line and max. at pipe wall.
(*c*) logarithmic with max. at centre line and min. at pipe wall.
(*d*) logarithmic with min. at centre line and max. at pipe wall.

251. Hydrodynamic entry length for turbulent flow is

(*a*) approx $0.05 \times Re \times D$
(*b*) approx $1.35 \times Re^{1/4} \times D$
(*c*) approx $0.05 \times Re^{1/4} \times D$
(*d*) approx $0.5 \times Re \times D^{1/4}$

252. During turbulent flow Buffer layer is located at

(*a*) next to viscous sub-layer
(*b*) below viscous sub-layer
(*c*) above inertial sub-layer
(*d*) above turbulent layer

253. Mass transfer co-efficient is maximum for

(*a*) laminar flow (*b*) turbulent flow
(*c*) transitional flow
(*d*) parabolic flow

254. Most widely used flow meter to measure liquid volume directly is

(*a*) nutating disc flow meter
(*b*) orifice meter
(*c*) venturi meter (*d*) piezometer tube

255. At the end of hydro dynamically entry length friction factor compared to fully developed value is

(*a*) about 2% (*b*) about 1%
(*c*) same (*d*) about 20%

256. Kinetic energy correction factor for fully developed turbulent flow in compare to fully develop laminar flow is

(*a*) more
(*b*) approximately half
(*c*) approximately double
(*d*) same

257. In case of fully developed flow in horizontal flow

(*a*) Viscous force is equal to pressure force.
(*b*) Viscous force is ≥ pressure force
(c) Viscous force is ≤ pressure force.
(*d*) Viscous force always > pressure force.

258. Velocity profile at viscous sub-layer is

(*a*) linear (*b*) parabolic
(*c*) logarithmic (*d*) either (*a*) or (*b*)

259. Flow profile at viscous sub-layer is

(*a*) zig zag (*b*) streamlined
(*c*) divergent (*d*) either (*b*) or (*c*)

260. The velocity component in the direction of normal to flow in laminar flow is

(*a*) zero
(*b*) a non-zero component with finite value
(*c*) higher than horizontal component
(*d*) infinite

261. In turbulent flow $(U_{max} - u)$ is called

(*a*) velocity difference
(*b*) velocity defect
(*c*) velocity decrement
(*d*) both (*b*) and (*c*)

262. Hydrodynamic entry length for laminar flow is

(*a*) approx $0.05 \times Re \times D$
(*b*) approx $1.35 \times Re^{1/4} \times D$
(*c*) approx $0.05 \times Re^{1/4} \times D$
(*d*) approx $0.5 \times Re \times D^{1/4}$

263. Between nozzle and orifice meter C_d of nozzle is

(*a*) $> C_d$ of orifice (*b*) $< C_d$ of orifice
(*c*) $= C_d$ of orifice (*d*) either (*a*) or (*b*)

264. Pump should run at

(*a*) system curve and supply curve intersecting point.
(*b*) performance curve and supply curve intersecting point.
(*c*) system curve and performance curve intersecting point.
(*d*) operating point.

265. Relative roughness is
(*a*) roughness height of the pipe to diameter of pipe.
(*b*) roughness height of the pipe to radius of pipe.
(*c*) diameter of pipe to Roughness height of the pipe.
(*d*) radius of pipe to Roughness height of the pipe.

266. Friction velocity is
(*a*) $\sqrt{\tau_w/\rho}$ (*b*) $\sqrt{\rho/\tau_w}$
(*c*) $\sqrt{\tau_w \times \rho}$ (*d*) τ_w/ρ

267. Eddy viscosity is minimum at
(*a*) centre of pipe
(*b*) just above the pipe wall
(*c*) at buffer layer
(*d*) just before the centre line of pipe

268. Moody chart indicates
(*a*) Darcy friction factor
(*b*) Moody friction factor
(*c*) Reynolds friction factor
(*d*) Prandtl friction factor

269. During laminar flow friction factor
(*a*) proportional to Reynolds number
(*b*) inversely proportional to Reynolds number
(*c*) does not depends on Reynolds number
(*d*) depends on surface roughness only

270. During laminar flow friction factor
(*a*) proportional to Reynolds number
(*b*) proportional to square root of Reynolds number
(*c*) does not depends on Reynolds number
(*d*) independents on surface roughness

271. Eddy motion loses its intensity near to wall due to
(*a*) no slip condition at wall
(*b*) high slip condition at wall
(*c*) high momentum transfer at wall
(*d*) low shear stress near the wall

272. Eddy diffusivity is an
(*a*) property of fluid
(*b*) not a property of fluid
(*c*) a property depends on flow condition
(*d*) both (*b*) and (*c*)

273. For a smooth pipe friction factor (f) is
(*a*) f = zero (*b*) f > zero
(*c*) $0 < f < 3$ (*d*) Always $f = 1$

274. Relative roughness curve is nearly horizontal at
(*a*) $\varepsilon/D = 0.1$ (*b*) $\varepsilon/D = 0.01$
(*c*) $\varepsilon/D = 0.11$ (*d*) $\varepsilon/D = 0.011$

275. Flow rate through the entire pipe system will remain same for
(*a*) pipe in parallel connection
(*b*) pipe in series connection
(*c*) both in series and parallel connection
(*d*) it never remains same for entire system

276. During laminar flow pressure drop occur due to
(*a*) viscous effects only
(*b*) momentum transfer only
(*c*) both (*a*) and (*b*) (*d*) none

277. During laminar flow pressure drop is
(*a*) reversible
(*b*) irreversible
(*c*) always reversible
(*d*) either (*a*) or (*b*)

278. Eddy viscosity is zero at
(*a*) centre of pipe
(*b*) just above the pipe wall
(*c*) at buffer layer
(*d*) it never be zero

279. During turbulent flow Eddy motion losses its intensity at
(*a*) centre of pipe line
(*b*) close to wall
(*c*) between centre and wall
(*d*) just close to centre

280. Relative roughness indicates
(*a*) mean height of roughness of the pipe to pipe diameter.
(*b*) RMS height of roughness of the pipe to pipe diameter.

(*c*) maximum height of roughness of the pipe to pipe diameter.
(*d*) mean height of roughness of the pipe to pipe radius.

281. For the same aspect ratio = 2 friction factor is high for
(*a*) rectangular duct
(*b*) ellipse section tube
(*c*) both have same friction factor
(*d*) can't tell

282. Following equation represents Poiseuille's law
(*a*) volume rate = $\delta P \times \pi \times D^3/128\ \mu L$
(*b*) volume rate = $\delta P \times \pi \times D^4/128\ \mu L$
(*c*) volume rate = $\delta P \times \pi \times D^4/64\ \mu L$
(*d*) volume rate = $\delta P \times D^4/128\ \mu L$

283. Thickness of viscous sub-layer is
(*a*) approx. 0.1 × dia. of pipe
(*b*) approx. 0.01 × dia. of pipe
(*c*) approx. 0.001 × dia. of pipe
(*d*) approx. 0.2 × dia. of pipe

284. Friction factor (f) for a smooth pipe is not zero due to
(*a*) non slip condition
(*b*) high slip condition
(*c*) as $R_e > 2000$
(*d*) no, f may be zero

285. Head loss through the entire pipe system will remain same for
(*a*) pipe in parallel connection.
(*b*) pipe in series connection.
(*c*) both in series and parallel connection.
(*d*) it never remains same for entire system.

286. In a pipe network following should be satisfy
(*a*) conservation of mass momentum.
(*b*) conservation of mass
(*c*) continuity equation
(*d*) both (*b*) and (*c*)

287. The flow over a body is said to be two dimensional if
1. body is very short.
2. body cross section is decrease along flow.
3. body cross section remains constant.
4. flow is parallel to body.
5. flow is normal to body.
6. body is long.

Correct answer is:
(*a*) sl. no. 1, 2 and 4
(*b*) sl. no. 2, 5 and 6
(*c*) sl. no. 2, 4 and 6
(*d*) sl. no. 3, 5 and 6

288. Air flow over running bullet is
(*a*) two-dimensional and axisymetric flow
(*b*) three dimensional and axisymetric flows
(*c*) two-dimensional and non-axisymetric flow.
(*d*) two-dimensional and non-symmetric flow.

289. The expression for velocity of ideal fluid at any point on the surface of the cylinder is given by
(*a*) $2U \sin \theta$ (*b*) $4U \sin \theta$
(*c*) $3U \sin \theta$ (*d*) $6U \sin \theta$

290. Yawing and rolling moment are zero for a body of
(*a*) symmetry about the lift-drag plane
(*b*) symmetry about the lift force only
(*c*) symmetry about the drag force only
(*d*) asymmetry about the lift-drag plane

291. A cricket ball flowing over air is an example of
(*a*) streamlined body
(*b*) bluff body
(*c*) blunt body
(*d*) both (*b*) and (*c*)

292. Streamlined body
(*a*) align its shape with the anticipated stream line in flow.
(*b*) align its X-axis with the anticipated stream line in flow.
(*c*) align its Z-axis with the anticipated stream line in flow.
(*d*) does not align its shape with the anticipated stream line in flow.

293. Force exerts by flowing fluid on a body in flow direction is
(*a*) hydrostatic force (*b*) drag force
(*c*) buoyancy (*d*) lift force

294. Drag and lift forces experienced by an object immersed in a fluid stream is due to
(*a*) pressure and turbulence of fluid
(*b*) pressure and viscosity of fluid
(*c*) pressure and gravity of fluid
(*d*) viscosity and density of fluid

295. Fluid force moment about the drag force direction is called
(*a*) drag moment (*b*) rolling moment
(*c*) angular moment (*d*) yawing moment

296. Drag force for a thin flat plate aligned parallel to flow is depends on
(*a*) wall shear only
(*b*) pressure force only
(*c*) both wall shear and pressure force
(*d*) none of (*a*) and (*b*)

297. Drag force for a thin flat plate aligned normal to flow is depends on
(*a*) wall shear only
(*b*) pressure force only
(*c*) both wall shear and pressure force
(*d*) none of (*a*) and (*b*)

298. Drag and lift coefficient are depends on
(*a*) shape of body
(*b*) Reynolds number
(*c*) surface roughness
(*d*) all of the above

299. Fluid force moment about the lift direction is called
(*a*) drag moment (*b*) rolling moment
(*c*) angular moment (*d*) yawing moment

300. In case of ideal fluid lift force may exist if there is
(*a*) Ppresence of circulation around the body
(*b*) non-presence of circulation around the body
(*c*) no viscosity
(*d*) very high Reynolds number

301. Lift force acting on a running bullet aligned with air flow is
(*a*) zero (*b*) > drag force
(*c*) = drag force (*d*) < drag force

302. Water flowing over a long pipe perpendicular to its axis when immersed inside a flowing fluid is
(*a*) two-dimensional flow
(*b*) three dimensional flows
(*c*) single dimensional flow
(*d*) depends on velocity of flow

303. Coefficient of lift depends on
(*a*) camber of airfoil
(*b*) angle of attack only
(*c*) both (*a*) and (*b*)
(*d*) none

304. Drag force exerts on a body inside a flowing fluid is
(*a*) perpendicular to direction of flow
(*b*) parallel to direction of flow
(*c*) in the direction of flow
(*d*) shear force in the direction of flow but pressure force in normal to flow direction

305. A racing car is an example of
(*a*) streamlined body
(*b*) bluff body
(*c*) blunt body
(*d*) both (*b*) and (*c*)

306. Viscosity of fluid could be measured from
(*a*) Magnus law (*b*) Stokes law
(*c*) both (*a*) and (*b*) (*d*) none

307. Lift force exerts on a body inside a flowing fluid is
(*a*) shear force and pressure force in the normal direction of flow.
(*b*) shear force in the normal direction of flow but pressure force in the flow direction.
(*c*) all force in the direction of flow.
(*d*) shear force and pressure force in the direction of flow.

308. To calculate total drag force following area is taken for calculation

(*a*) whole body curved surface area
(*b*) frontal area
(*c*) planform area
(*d*) area not taken for calculation

309. Drag force is related with fluid stream velocity as
(*a*) $F_D \propto U^2$ (*b*) $F_D \propto U$
(*c*) $F_D \propto U^{1/2}$ (*d*) $F_D \propto 1/U^2$

310. Drag force for a thin flat plate aligned at angle θ to flow is depends on
(*a*) wall shear only
(*b*) pressure force only
(*c*) both wall shear and pressure force
(*d*) none of (*a*) and (*b*)

311. To calculate total lift force following area is taken for calculation
(*a*) whole body curved surface area
(*b*) frontal area (*c*) planform area
(*d*) area not taken for calculation

312. Maximum velocity of a falling body is called
(*a*) terminal velocity
(*b*) streamline velocity
(*c*) choke velocity (*d*) none

313. Friction drag is zero when flat surface is
(*a*) normal to the flow
(*b*) parallel to the flow
(*c*) makes 45° with direction of flow
(*d*) it does never be zero

314. The expression for co-efficient of lift for an air-foil is given by
(*a*) $C_L = 2\pi \sin \alpha$ (*b*) $C_L = 4\pi \sin \alpha$
(*c*) $C_L = 2\pi \sin 2\alpha$ (*d*) $C_L = 2\pi \sin^2 \alpha$

315. Friction drag is maximum when flat surface is
(*a*) normal to the flow
(*b*) parallel to the flow
(*c*) makes 45° with direction of flow
(*d*) it does never be zero

316. In very less viscous fluid contribution of friction drag to total drag force on a blunt body is
(*a*) very less
(*b*) as same as pressure drag force
(*c*) very minute or negligible
(*d*) very high

317. Drag force depends on
(*a*) Reynolds number (*b*) Mach number
(*c*) Froude number (*d*) all of the above

318. In laminar flow friction drag coefficient related with surface roughness as
(*a*) proportional
(*b*) inversely proportional
(*c*) both independent
(*d*) $F_D \propto \varepsilon^{1/2}$

319. When body fully submerged in fluid then Drag force depends on
(*a*) Reynolds number (*b*) Froude number
(*c*) only on (*a*) (*d*) all of the above

320. In very high viscous fluid contribution of friction drag to total drag force on a blunt body is
(*a*) very less
(*b*) as same as pressure drag force
(*c*) very minute or negligible
(*d*) very high

321. In very high viscous fluid contribution of pressure drag to total drag force on a blunt body is
(*a*) very less
(*b*) as same as friction drag force
(*c*) very minute or negligible
(*d*) very high

322. Drag force will be maximum for a free falling body is at
(*a*) just after starting free fall
(*b*) just before touching the ground
(*c*) at middle of journey
(*d*) after attending 66% of maximum velocity

323. Pressure drag is proportional to
(*a*) frontal area (*b*) planform area
(*c*) full surface area
(*d*) independent of surface area

324. For an blunt body most dominating force in fluid is
(*a*) pressure drag (*b*) friction drag
(*c*) both are same (*d*) none

325. Equation of skin drag is

(*a*) $\int_A \tau_o \, dA \cos \theta$ (*b*) $\int_A \tau_o \, dA \sin \theta$

(*c*) $\int_A \tau_o^2 \, dA \cos \theta$ (*d*) $\int_A \tau_o^2 \, dA \sin \theta$

326. Equation of pressure drag is

(*a*) $\int_A p \, dA \cos \theta$ (*b*) $\int_A p \, dA \sin \theta$

(*c*) $\int_A p \, dA \cos \theta$ (*d*) $\int_A p \, dA \sin \theta$

327. High pressure drag creates on a bluff body inside flowing fluid due to

(*a*) low surface area of bluff body

(*b*) high surface area of bluff body

(*c*) large wake formation zone

(*d*) surface coincides with stream lines

328. When Airplane is in steady state that time

(*a*) weight of airplane = Drag force

(*b*) thrust developed by engine = Drag force

(*c*) weight of airplane = Lift force

(*d*) both (*b*) and (*c*)

329. Velocity at the bottom of a spinning ball is

(*a*) wqual to that at the top

(*b*) less than that at top

(*c*) higher than that at top

(*d*) independent of spinning action

330. An airfoil will be stall when

(*a*) angle of attack is < Angle of attack for minimum lift

(*b*) angle of attack is = Angle of attack for minimum lift

(*c*) angle of attack is < Angle of attack for maximum lift

(*d*) angle of attack is > Angle of attack for maximum lift

331. Lift due to spinning of a cylindrical body is called

(*a*) Stokes effect (*b*) Ferel effect

(*c*) Magnus effect (*d*) Kutta effect

332. A copper sphere of 5mm diameter falls in milk at a terminal velocity of 0.05 m/sec with Re = 0.2, assuming Stokes law C_D is

(*a*) 120 (*b*) 160

(*c*) 60 (*d*) 1200

333. In very less viscous fluid contribution of pressure drag to total drag force on a blunt body is

(*a*) very less

(*b*) as same as pressure drag force

(*c*) very minute or negligible

(*d*) very high

334. According to Stokes law ratio of skin friction drag and pressure drag on sphere will be

(*a*) 1 : 2 (*b*) 2 : 1

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

335. According to Stokes law contribution of friction drag on total drag force on a sphere is

(*a*) very less

(*b*) 2/3 of total drag force

(*c*) 1/3 of total drag force

(*d*) 1/4 of total drag force

336. According to Stokes law contribution of pressure drag on total drag force on a sphere is

(*a*) very less

(*b*) 2/3 of total drag force

(*c*) 1/3 of total drag force

(*d*) 1/4 of total drag force

337. Zero drag on bodies could be possible as per

(*a*) d'Alembert's paradox

(*b*) Magnus principle

(*c*) Kutta-Joukowski equation

(*d*) Stokes principle

338. When an asymmetric body is immersed in an ideal flowing fluid then drag force will

(*a*) increase

(*b*) decrease compare to symmetric body

(*c*) become zero

(*d*) zero and it is also zero for symmetric body

339. Lift coefficient of a rotating cylinder is related to its tangential velocity as

(*a*) $C_L \propto$ Tangential velocity

(*b*) $C_L \propto$ (Tangential velocity)^2

(*c*) $C_L \propto$ (Tangential velocity)$^{1/2}$

(*d*) $C_L \propto$ 1/ Tangential velocity

340. Zero-lift drag coefficient can be define as

(*a*) $CD + C_{D,\,i}$ (C_D = Total drag coefficient for a given power. $C_{D,\,i}$ = lift-induced drag coefficient)

(*b*) $C_D - C_{D,\,i}$ (*c*) $C_D / C_{D,\,i}$
(*d*) $C_D \times C_{D,\,i}$

341. Which one is correct?
(*a*) $C_D/C_L = \tan \alpha$ (*b*) $C_D/C_L = \cot \alpha$
(*c*) $C_D/C_L = \sin \alpha$ (*d*) $C_D/C_L = \cos \alpha$

342. Coefficient of drag is depends on
(*a*) Mach number
(*b*) Reynolds number
(*c*) Fraud number
(*d*) all of the above

343. Parasite drag force is
(*a*) total drag force + Induced drag force
(*b*) total drag force – Induced drag force
(*c*) drag force – Induced drag force
(*d*) total drag + lift force

344. Which of the following drag depends on shape of body?
(*a*) parasite drag (*b*) form drag
(*c*) surface drag (*d*) both (*b*) and (*c*)

345. Magnus effect could be explained by
(*a*) Bernoulli principle
(*b*) Magnus principle
(*c*) Newton's third law
(*d*) both (*a*) and (*b*)

346. For a Bluff body wake formation is
(*a*) very small (*b*) very large
(*c*) zero (*d*) moderate

347. Vibration and noise is less for
(*a*) bluff body
(*b*) blunt body
(*c*) streamlined body
(*d*) both (*a*) and (*c*)

348. In case of open channel flow is related with
(*a*) flow of fluids
(*b*) flow of liquids only
(*c*) flow of gas only
(*d*) flow of fluid which have a free surface

349. In Open channel flow cause of flow is
(*a*) gravity force only
(*b*) gravity and pressure force
(*c*) pressure force only
(*d*) viscous force

350. The shape of velocity profile in open channel flow is depends on
(*a*) Reynolds number
(*b*) channel roughness
(*c*) both (*a*) and (*b*)
(*d*) Froude number

351. Flow rate in open channel is depends on
(*a*) gravity force only
(*b*) friction force due to roughness only
(*c*) viscous force
(*d*) both (*a*) and (*b*)

352. In case of open channel flow velocity is zero at
(*a*) top and bottom of flow
(*b*) side and bottom of flow
(*c*) side and top of flow
(*d*) at just below the top surface of flow

353. Prismatic channel have
(*a*) constant bed slope and same cross section along the length.
(*b*) constant bed slope and reducing cross section along the length.
(*c*) constant bed slope and increasing cross section along the length.
(*d*) variable bed slope and same cross section along the length.

354. Maximum velocity of flow occur in open channel flow at
(*a*) about 20 – 25% of depth
(*b*) on the surface
(*c*) about 40 – 60% of depth
(*d*) at the bottom of channel

355. Example of non-exponential channel is
(*a*) trapezoidal channel
(*b*) parabolic channel
(*c*) triangular channel
(*d*) all of the above

356. In case of steady flow, flow depth is
(*a*) constant at a location with time
(*b*) proportional to length with time
(*c*) constant along length with time
(*d*) vary with time

357. Normal depth is
(*a*) flow depth in non-uniform flow in open channel.

(*b*) flow depth in uniform flow in open channel.
(*c*) flow depth in unsteady flow in open channel.
(*d*) flow depth in steady flow in open channel.

358. In open channel flow, flow is laminar when
(*a*) $Re > 500$ (*b*) $Re > 5000$
(*c*) $Re < 500$ (*d*) $Re < 2000$

359. For tranquil flow through open channel
(*a*) $Fr > 1$ (*b*) $Fr < 1$
(*c*) $Fr = 1$ (*d*) $Fr \leq 1$

360. In open channel flow, flow is turbulent when
(*a*) $Re > 2000$ (*b*) $Re > 5000$
(*c*) $Re > 500$ (*d*) $Re < 2000$

361. For supercritical flow through open channel
(*a*) $Fr > 1$ (*b*) $Fr < 1$
(*c*) $Fr = 1$ (*d*) $Fr \leq 1$

362. Uniform flow could be occur in
(*a*) natural channel only
(*b*) artificial channel only
(*c*) prismatic channel only
(*d*) both (*b*) and (*c*)

363. Wetted perimeter is
(*a*) length of channel boundary in contact with the flowing water at any section.
(*b*) length of channel boundary not in contact with the flowing water at any section.
(*c*) length of channel boundary section.
(*d*) none of the above.

364. Hydraulic radius of a pipe running full is
(*a*) d (*b*) $d/2$
(*c*) $d/3$ (*d*) $d/4$

365. Example of exponential channel is
(*a*) rectangular channel
(*b*) parabolic channel
(*c*) triangular channel
(*d*) all of the above

366. The ratio of the wetted area to the top width is
(*a*) hydraulic depth
(*b*) hydraulic radius
(*c*) hydraulic perimeter
(*d*) none

367. The most important parameter that governs the character of flow in open channel is
(*a*) Weber number (*b*) Froude number
(*c*) Mach number (*d*) Euler number

368. Froude number could be expressed as
(*a*) flow speed/wave speed
(*b*) flow speed/sound speed
(*c*) wave speed/flow speed
(*d*) wave speed/sound speed

369. Froude number square could be express as
(*a*) inertia force/Viscous force
(*b*) viscous force/Gravity force
(*c*) inertia force/Gravity force
(*d*) pressure force/Gravity force

370. Afflux is
(*a*) decrease of water level suddenly
(*b*) increase of water level suddenly
(*c*) constant water level for certain time in a disturb zone
(*d*) none

371. When $Fr < 1$ it is called
(*a*) streaming flow (*b*) critical flow
(*c*) torrential flow (*d*) steady flow

372. At critical depth specific energy is
(*a*) maximum (*b*) zero
(*c*) minimum (*d*) 1/3 of maximum

373. The cross-section of a channel is said to be best if the
(*a*) wetted perimeter is maximum for given area.
(*b*) roughness co-efficient is minimum.
(*c*) wetted perimeter is minimum for given area.
(*d*) hydraulic depth is least.

374. For maximum discharge through a circular channel, depth of flow should be equal to
(*a*) 60% of channel diameter
(*b*) 95% of channel diameter

(*c*) 100% of channel diameter
(*d*) 20% of channel diameter

375. The hydraulic radius of most economical trapezoidal channel section has
(*a*) 2 × depth of flow
(*b*) 0.5 × depth of flow
(*c*) 0.25 × depth of flow
(*d*) Depth of flow

376. Wave speed on ocean surface is
(*a*) proportional to depth of liquid
(*b*) inversely proportional of liquid
(*c*) independent of depth of liquid
(*d*) always constant

377. Length of back water curve
(*a*) $l = (E_2 - E_1) / (S_b - S_e)$ where S_b is the slope of channel bed and S_e is slope of energy line.
(*b*) $l = (E_2 + E_1) / (S_b - S_e)$ where S_b is the slope of channel bed and S_e is slope of energy line.
(*c*) $l = (E_2 - E_1) / (S_b + S_e)$ where S_b is the slope of channel bed and S_e is slope of energy line.
(*d*) $l = (E_2 + E_1) / (S_b + S_e)$ where S_b is the slope of channel bed and S_e is slope of energy line.

378. For a half full circular channel hydraulic depth is
(*a*) $\pi R/2$ (*b*) $\pi R/4$
(*c*) $\pi R/6$ (*d*) $2\pi R/3$

379. Just after the sluice gate flow of water is
(*a*) subcritical type
(*b*) supercritical type
(*c*) critical type
(*d*) any kind of the above

380. Infinitesimal surface wave speed depends on
(*a*) gravity at that place
(*b*) depth of liquid (*c*) both (*a*) and (*b*)
(*d*) it is independent of depth of flow but depends on gravity

381. Pressure and dynamic head of open channel flow together called
(*a*) specific energy
(*b*) absolute energy of flow
(*c*) total mechanical energy
(*d*) (*a*) or (*c*)

382. Specific energy in open channel flow become infinite when
(*a*) flow depth tends to zero
(*b*) flow depth is highly large
(*c*) kinetic energy is very small
(*d*) pressure energy is very high

383. Chezy coefficient in open channel flow is
(*a*) $C = 2\sqrt{gf}$ (*b*) $C = 2\sqrt{2g/f}$
(*c*) $C = \sqrt{2g/f}$ (*d*) $C = 2\sqrt{3g/f}$

384. Minimum specific energy require to support specific flow rate is called
(*a*) critical energy
(*b*) absolute specific energy
(*c*) relative specific energy
(*d*) supercritical specific energy

385. Through an economical circular channel section discharge will be maximum when
(*a*) (A^3/P) is minimum
(*b*) (A/P) is minimum
(*c*) (A^3/P) is maximum
(*d*) (A/P) is maximum

386. Through an economical circular channel section flow velocity will be maximum when
(*a*) (A^3/P) is minimum
(*b*) (A/P) is minimum
(*c*) (A^3/P) is maximum
(*d*) (A/P) is maximum

387. Large sewers bottom section are designed with shape of
(*a*) triangular shape
(*b*) semi circular shape
(*c*) trapezoidal shape
(*d*) both (*a*) and (*c*)

388. Large sewers are designed for
(*a*) constant velocity and maximum discharge rate
(*b*) constant discharge and maximum velocity of flow
(*c*) constant velocity and minimum discharge rate
(*d*) minimum discharge and maximum velocity of flow

389. At critical specific energy critical depth of flow is
(*a*) 1.5 × critical depth of flow
(*b*) 3 × critical depth of flow
(*c*) 2 × critical depth of flow
(*d*) 2.5 × critical depth of flow

390. Best rectangular open channel should have
(*a*) width of channel = 1.2 × flow depth
(*b*) width of channel = 2 × flow depth
(*c*) width of channel = 2 × hydraulic radius
(*d*) width of channel = flow depth

391. Best trapezoidal open channel should have
(*a*) width of channel = 1.2 × flow depth
(*b*) width of channel = 2 × flow depth
(*c*) width of channel = 2 × hydraulic radius
(*d*) width of channel = flow depth

392. Best trapezoidal open channel should have trapezoidal angle
(*a*) $\theta = 45°$ (*b*) $\theta = 60°$
(*c*) $\theta = 30°$ (*d*) $\theta = 66.5°$

393. Slope of free water surface during Gradual varied flow could be express as
(*a*) $dy/dx = (S_b - S_e)/(1 - Fr^2)$
(*b*) $dy/dx = (S_b - S_e)/(1 + Fr^2)$
(*c*) $dy/dx = (S_b + S_e)/(1 - Fr^2)$
(*d*) $dy/dx = (S_b - S_e)/(1 - Fr)$

394. Best flow depth for $\theta = 60°$ trapezoidal angle will be
(*a*) width of channel = 1.2 × flow depth
(*b*) width of channel = 2/√3 × flow depth
(*c*) width of channel = 2/√3 × hydraulic radius
(*d*) width of channel = √3 × flow depth

395. Best flow depth for $\theta = 60°$ trapezoidal angle will be
(*a*) width of channel = 1.2 × flow depth
(*b*) width of channel = 1/√3 × flow depth
(*c*) width of channel = 2/√3 × hydraulic radius
(*d*) width of channel = 1/√3 × hydraulic radius

396. According to Manning's formula Chezy's constant
(*a*) $C = R^{1/6}/N$, where N = Manning's constant; R = hydraulic radius
(*b*) $C = R^{1/6} N$ (*c*) $C = R^{1/2}/6N$
(*d*) $C = R^{1/3}/N$

397. For maximum discharge through circular channel
(*a*) hydraulic radius = 0.305 × diameter
(*b*) hydraulic radius = 0.29 × diameter
(*c*) hydraulic radius = 0.81 × diameter
(*d*) hydraulic radius = 0.95 × diameter

398. For maximum velocity through circular channel
(*a*) hydraulic radius = 0.305 × diameter
(*b*) hydraulic radius = 0.29 × diameter
(*c*) hydraulic radius = 0.81 × diameter
(*d*) hydraulic radius = 0.95 × diameter

399. For maximum discharge through circular channel
(*a*) depth of flow = 0.305 × diameter
(*b*) depth of flow = 0.29 × diameter
(*c*) depth of flow = 0.95 × diameter
(*d*) hydraulic radius = 0.95 × diameter

400. For maximum velocity through circular channel
(*a*) depth of flow = 0.305 × diameter
(*b*) depth of flow = 0.29 × diameter
(*c*) depth of flow = 0.81 × diameter
(*d*) hydraulic radius = 0.95 × diameter

401. The strength of hydraulic jump is govern by
(*a*) gradient of the bed
(*b*) froude number
(*c*) velocity of upstream
(*d*) velocity of downstream

402. Alternate depth of flow in open channel flow has occur at
(*a*) same specific energy
(*b*) same specific force
(*c*) same total energy
(*d*) all of the above

403. For uniform flow through the open channel surface slope should be

(*a*) 1 (*b*) Zero
(*c*) Infinite (*d*) 100

404. Carrying capacity of channel is measured by
(*a*) conveyance factor
(*b*) friction factor
(*c*) slope of bed
(*d*) manning's factor

405. Rugosity co-efficient is
(*a*) Chezy's constant (*b*) Manning's factor
(*c*) Bazin's constant (*d*) Reynolds factor

406. At no slip condition velocity of fluid at solid boundary is
(*a*) > as velocity of boundary
(*b*) = as velocity of boundary
(*c*) < as velocity of boundary
(*d*) none of the above

407. Velocity distribution in the turbulent boundary layer is produce by
(*a*) log law
(*b*) power law
(*c*) prandtle's 1/7 power law
(*d*) all of the above

408. According to boundary layer theory when fluid velocity increase in the downward direction
(*a*) boundary layer growth is increase
(*b*) boundary layer growth is decrease
(*c*) boundary layer growth is constant
(*d*) boundary layer growth is increase rapidly

409. Large sewer bottom sections are designed for
(*a*) maximum discharge rate
(*b*) constant discharge rate
(*c*) variable discharge rate
(*d*) minimum discharge rate

Answers

1. (*b*)	**2.** (*a*)	**3.** (*b*)	**4.** (*b*)	**5.** (*d*)	**6.** (*d*)
7. (*d*)	**8.** (*b*)	**9.** (*a*)	**10.** (*b*)	**11.** (*b*)	**12.** (*c*)
13. (*c*)	**14.** (*b*)	**15.** (*c*)	**16.** (*b*)	**17.** (*a*)	**18.** (*c*)
19. (*a*)	**20.** (*b*)	**21.** (*d*)	**22.** (*b*)	**23.** (*b*)	**24.** (*a*)
25. (*b*)	**26.** (*c*)	**27.** (*c*)	**28.** (*b*)	**29.** (*a*)	**30.** (*b*)
31. (*c*)	**32.** (*b*)	**33.** (*b*)	**34.** (*c*)	**35.** (*b*)	**36.** (*a*)
37. (*a*)	**38.** (*c*)	**39.** (*a*)	**40.** (*a*)	**41.** (*b*)	**42.** (*c*)
43. (*a*)	**44.** (*b*)	**45.** (*a*)	**46.** (*a*)	**47.** (*c*)	**48.** (*a*)
49. (*a*)	**50.** (*b*)	**51.** (*c*)	**52.** (*b*)	**53.** (*a*)	**54.** (*b*)
55. (*a*)	**56.** (*c*)	**57.** (*d*)	**58.** (*a*)	**59.** (*c*)	**60.** (*d*)
61. (*a*)	**62.** (*b*)	**63.** (*c*)	**64.** (*a*)	**65.** (*b*)	**66.** (*a*)
67. (*a*)	**68.** (*b*)	**69.** (*c*)	**70.** (*d*)	**71.** (*a*)	**72.** (*b*)
73. (*b*)	**74.** (*c*)	**75.** (*a*)	**76.** (*b*)	**77.** (*a*)	**78.** (*c*)
79. (*b*)	**80.** (*b*)	**81.** (*d*)	**82.** (*c*)	**83.** (*c*)	**84.** (*c*)
85. (*d*)	**86.** (*c*)	**87.** (*a*)	**88.** (*c*)	**89.** (*c*)	**90.** (*a*)
91. (*d*)	**92.** (*c*)	**93.** (*b*)	**94.** (*d*)	**95.** (*b*)	**96.** (*b*)
97. (*d*)	**98.** (*c*)	**99.** (*d*)	**100.** (*d*)	**101.** (*a*)	**102.** (*a*)
103. (*b*)	**104.** (*b*)	**105.** (*d*)	**106.** (*b*)	**107.** (*a*)	**108.** (*c*)
109. (*a*)	**110.** (*d*)	**111.** (*b*)	**112.** (*a*)	**113.** (*d*)	**114.** (*b*)
115. (*c*)	**116.** (*a*)	**117.** (*b*)	**118.** (*a*)	**119.** (*c*)	**120.** (*c*)
121. (*a*)	**122.** (*c*)	**123.** (*a*)	**124.** (*a*)	**125.** (*b*)	**126.** (*b*)
127. (*c*)	**128.** (*d*)	**129.** (*b*)	**130.** (*a*)	**131.** (*c*)	**132.** (*b*)
133. (*a*)	**134.** (*a*)	**135.** (*c*)	**136.** (*a*)	**137.** (*c*)	**138.** (*b*)

139. (*a*)	**140.** (*c*)	**141.** (*b*)	**142.** (*b*)	**143.** (*b*)	**144.** (*c*)
145. (*a*)	**146.** (*d*)	**147.** (*c*)	**148.** (*a*)	**149.** (*a*)	**150.** (*a*)
151. (*c*)	**152.** (*a*)	**153.** (*b*)	**154.** (*d*)	**155.** (*d*)	**156.** (*b*)
157. (*a*)	**158.** (*d*)	**159**. (*b*)	**160.** (*d*)	**161.** (*b*)	**162.** (*a*)
163. (*a*)	**164.** (*b*)	**165.** (*d*)	**166.** (*b*)	**167.** (*a*)	**168.** (*a*)
169. (*b*)	**170.** (*b*)	**171.** (*b*)	**172.** (*b*)	**173.** (*d*)	**174.** (*a*)
175. (*c*)	**176.** (*a*)	**177.** (*b*)	**178.** (*b*)	**179.** (*c*)	**180.** (*a*)
181. (*b*)	**182.** (*a*)	**183.** (*c*)	**184.** (*a*)	**185.** (*d*)	**186.** (*c*)
187. (*c*)	**188.** (*a*)	**189.** (*b*)	**190.** (*b*)	**191.** (*a*)	**192.** (*b*)
193. (*b*)	**194.** (*d*)	**195.** (*a*)	**196.** (*a*)	**197.** (*d*)	**198.** (*b*)
199. (*a*)	**200.** (*d*)	**201.** (*b*)	**202.** (*b*)	**203.** (*a*)	**204.** (*d*)
205. (*b*)	**206.** (*c*)	**207.** (*c*)	**208.** (*a*)	**209.** (*c*)	**210.** (*b*)
211. (*a*)	**212.** (*c*)	**213.** (*c*)	**214.** (*a*)	**215.** (*d*)	**216.** (*a*)
217. (*b*)	**218.** (*d*)	**219.** (*c*)	**220.** (*a*)	**221**. (*d*)	**222.** (*b*)
223. (*a*)	**224.** (*b*)	**225.** (*b*)	**226.** (*b*)	**227.** (*c*)	**228.** (*b*)
229. (*a*)	**230.** (*d*)	**231.** (*b*)	**232.** (*a*)	**233.** (*a*)	**234.** (*a*)
235. (*d*)	**236.** (*a*)	**237.** (*a*)	**238.** (*d*)	**239.** (*a*)	**240.** (*b*)
241. (*a*)	**242.** (*c*)	**243.** (*c*)	**244.** (*a*)	**245.** (*b*)	**246.** (*b*)
247. (*a*)	**248.** (*b*)	**249.** (*c*)	**250.** (*a*)	**251.** (*b*)	**252.** (*a*)
253. (*b*)	**254.** (*a*)	**255.** (*a*)	**256.** (*b*)	**257.** (*a*)	**258.** (*a*)
259. (*b*)	**260.** (*a*)	**261.** (*b*)	**262.** (*a*)	**263.** (*a*)	**264.** (*d*)
265. (*a*)	**266.** (*a*)	**267.** (*b*)	**268.** (*a*)	**269.** (*b*)	**270.** (*d*)
271. (*a*)	**272.** (*d*)	**273.** (*b*)	**274.** (*c*)	**275.** (*b*)	**276.** (*a*)
277. (*b*)	**278.** (*b*)	**279.** (*b*)	**280.** (*a*)	**281.** (*b*)	**282.** (*b*)
283. (*b*)	**284.** (*a*)	**285.** (*a*)	**286.** (*d*)	**287.** (*d*)	**288.** (*a*)
289. (*a*)	**290.** (*a*)	**291.** (*d*)	**292.** (*a*)	**293.** (*b*)	**294.** (*b*)
295. (*b*)	**296.** (*a*)	**297.** (*b*)	**298.** (*d*)	**299.** (*d*)	**300.** (*a*)
301. (*a*)	**302.** (*a*)	**303.** (*b*)	**304.** (*c*)	**305.** (*a*)	**306.** (*b*)
307. (*a*)	**308.** (*b*)	**309.** (*a*)	**310.** (*c*)	**311.** (*c*)	**312.** (*a*)
313. (*a*)	**314.** (*a*)	**315.** (*b*)	**316.** (*c*)	**317.** (*d*)	**318.** (*c*)
319. (*c*)	**320.** (*d*)	**321.** (*a*)	**322.** (*b*)	**323.** (*a*)	**324.** (*a*)
325. (*b*)	**326.** (*a*)	**327.** (*c*)	**328.** (*d*)	**329.** (*b*)	**330.** (*d*)
331. (*c*)	**332.** (*a*)	**333.** (*d*)	**334.** (*b*)	**335.** (*b*)	**336.** (*c*)
337. (*a*)	**338.** (*d*)	**339.** (*a*)	**340.** (*b*)	**341.** (*a*)	**342.** (*b*)
343. (*b*)	**344.** (*b*)	**345.** (*a*)	**346.** (*b*)	**347.** (*c*)	**348.** (*b*)
349. (*a*)	**350.** (*b*)	**351.** (*d*)	**352.** (*b*)	**353.** (*a*)	**354.** (*a*)
355. (*a*)	**356.** (*a*)	**357.** (*b*)	**358.** (*c*)	**359.** (*b*)	**360.** (*a*)
361. (*a*)	**362.** (*d*)	**363.** (*a*)	**364.** (*d*)	**365.** (*d*)	**366.** (*a*)
367. (*b*)	**368.** (*a*)	**369.** (*c*)	**370.** (*b*)	**371.** (*a*)	**372.** (*c*)
373. (*c*)	**374.** (*b*)	**375.** (*b*)	**376.** (*c*)	**377.** (*a*)	**378.** (*b*)
379. (*b*)	**380.** (*c*)	**381.** (*d*)	**382.** (*a*)	**383.** (*b*)	**384.** (*a*)
385. (*c*)	**386.** (*d*)	**387.** (*d*)	**388.** (*a*)	**389.** (*a*)	**390.** (*b*)
391. (*c*)	**392.** (*b*)	**393.** (*a*)	**394.** (*b*)	**395.** (*d*)	**396.** (*a*)
397. (*b*)	**398.** (*a*)	**399.** (*c*)	**400.** (*c*)	**401.** (*b*)	**402.** (*a*)
403. (*b*)	**404.** (*d*)	**405.** (*d*)	**406.** (*d*)	**407.** (*d*)	**408.** (*b*)
409. (*d*)					