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DEPARTMENT OF CIVIL ENGINEERING

SECOND YEAR (SY)

SCHEME: I **SEMESTER: IV**

NAME OF SUBJECT: HYDRAULICS

Subject Code: 22401

UNIT WISE MULTIPLE CHOICE QUESTIONS BANK

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Question Bank for Multiple Choice Questions

Program: Diploma in Civil engineering	**Program Code:- CE**
Scheme:-I	**Semester:- 4**
Course:- Hydraulics	**Course Code:- 22401**

01 – Pressure Measurement	**Marks:-12**

Content of Chapter:-

1.1 Technical terms used in Hydraulics — fuid fluid mechanics, hydraulics, hydrostatics, and hydrodynamics-ideal and real fluid, application of hydraulics in Civil Engineering field.

1.2 Physical properties of fluid - densit specific volume_ specific gravity-surface tension-capillarity. vise Newton's law of viscosity

1.3 Various types of pressure—Atmospheric Pressure- Gauge Pressure-Absolute Pressure-Vaccume Pressure, Concept of Pressure Head and its unit, Pascal's law of fluid pressure and its uses.

1.4 Conversion of pressure head of one liquid in terms of other liquid.

1.5 Measurement of Pressure by different methods(By Piezometer, simple manometers and Bordon pressure Gauge)

1.6 Measurement of difference of pressure by differential U tube manometers and inverted U tube manometers

1. The value of the viscosity of an ideal fluid is
a) zero b) unity c) infinity d) more than that of a real fluid
Answer: a

2. Which one of the following is the unit of mass density?
a) kg/m3 b) kg/m2 c) kg/m d) kg/ms
Answer: a

3. The specific volume of a liquid is the reciprocal of
a) weight density
b) mass density
c) specific weight
d) specific volume
Answer: b

4. Which one of the following is not a unit of dynamic viscosity?
a) Pa-s
b) N-s/m2
c) Poise
d) Stokes
Answer: d

5. The kinematic viscosity of a fluid is 0.1 Stokes. What will be the value is m2/s?
a) 10-2
b) 10-3
c) 10-4
d) 10-5
Answer: d

6. For liquid fluids will capillarity rise (or fall) increase or decrease with rise in temperature.
a) Increase
b) Decrease
c) Remain constant
d) First decrease then increase
Answer: b

7. What does Kinematic Viscosity depend upon?
a) Density
b) Pressure
c) Fluid level
d) Fluid Flow
Answer: a

8. When is a fluid said to be ideal?
a) Non viscous and Incompressible
b) Viscous and compressible
c) Viscous and Incompressible
d) Incompressible
Answer: a

9. Which of the following is not Newtonian fluid?
a) Glycerine
b) Kerosene
c) Tooth paste
d) Air
Answer: c

10. The specific gravity of a liquid has
a) the same unit as that of mass density
b) the same unit as that of weight density
c) the same unit as that of specific volume
d) no unit
Answer: d

11. Which property of the fluid offers resistance to deformation under the action of shear force?
a) Density
b) Viscosity
c) Permeability
d) Specific gravity
Answer: b

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12. Shear stress in static fluid is
a) Always zero
b) Always maximum
c) Between zero to maximum
d) Unpredictable
Answer: a

13. The specific weight of the fluid depends upon
a) Gravitational acceleration
b) Mass density of the fluid
c) Both a. and b.
d) None of the above
Answer: c

14. The specific gravity of water is taken as
a) 0.001
b) 0.01
c) 0.1
d) 1
Answer: d

15. When orifice is called 'large orifice'?
a) If the head of liquid is less than 5 times the depth of orifice
b) If the head of liquid is less than 2.5 times the depth of orifice
c) If the head of liquid is less Hence, 4 times the depth of orifice
d) If the head of liquid is less than 1.5 times the depth of orifice
Answer: a

16. Capillarity is due to
a) Cohesion
b) Adhesion
c) Both a& b
d) None of the above
Answer: c

17. Poise is the unit of
a) Dynamic viscosity
b) Velocity gradient
c) Mass density
d) Kinematic viscosity
Answer: a

18. Which one is in a state of failure?
a) Solid
b) Liquid
c) Gas
d) Fluid
Answer: d

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19. A small shear force is applied on an element and then removed. If the element regains it's original position, what kind of an element can it be?
a) Solid
b) Liquid
c) Fluid
d) Gaseous
Answer: a

20. In which type of matter, one won't find a free surface?
a) Solid
b) Liquid
c) Gas
d) Fluid
Answer: c

21. If a person studies about a fluid which is at rest, what will you call his domain of study?
a) Fluid Mechanics
b) Fluid Statics
c) Fluid Kinematics
d) Fluid Dynamics
Answer: b

22. The value of the compressibility of an ideal fluid is
a) zero
b) unity
c) infinity
d) more than that of a real fluid
Answer: a

23. The value of the Bulk Modulus of an ideal fluid is
a) zero
b) unity
c) infinity
d) less than that of a real fluid
Answer: c

24. The value of the viscosity of an ideal fluid is
a) zero
b) unity
c) infinity
d) more than that of a real fluid
Answer: a

25. The value of the surface tension of an ideal fluid is
a) zero
b) unity
c) infinity
d) more than that of a real fluid
Answer: a

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26. Which one of the following is the unit of mass density?
a) kg = m3
b) kg = m2
c) kg = m
d) kg = ms
Answer: a

27. The specific gravity of a liquid has
a) the same unit as that of mass density
b) the same unit as that of weight density
c) the same unit as that of specific volume
d) no unit
Answer: d

28. The specific volume of a liquid is the reciprocal of
a) weight density
b) mass density
c) specific weight
d) specific volume
Answer: b

29. Which one of the following is the unit of specific weight?
a) N = m3
b) N = m2
c) N = m
d) N = ms
Answer: a

30. Which one of the following is the dimension of mass density?
a) [M1 L-3 T0].
b) [M1 L3 T0].
c) [M0 L-3 T0].
d) [M0 L3 T0].
Answer: a

31. Which one of the following is the dimension of specific gravity of a liquid?
a) [M1 L-3 T0].
b) [M1 L0 T0].
c) [M0 L-3 T0].
d) [M0 L0 T0].
Answer: d

31. Which one of the following is the dimension of specific volume of a liquid?
a) [M1 L-3 T0].
b) [M-1 L3 T0].
c) [M-1 L-3 T0].
d) [M0 L3 T0].
Answer: b

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32. Which one of the following is the dimension of specific weight of a liquid?
a) [ML-3 T -2].
b) [ML3 T-2].
c) [ML-2 T-2].
d) [ML2 T-2].
Answer: c

33. Two fluids 1 and 2 have mass densities of p1 and p2 respectively. If p1 > p2, which one of the following expressions will represent the relation between their specific volumes v1 and v2?
a) v1 > v2
b) v1 < v2
c) v1 = v2
d) Cannot be determined due to insufficient information.
Answer: b

34. A beaker is filled with a liquid up to the mark of one litre and weighed. The weight of the liquid is found to be 6.5 N. The specific weight of the liquid will be
a) 6:5 kN = m3
b) 6:6 kN = m3
c) 6:7 kN = m3
d) 6:8 kN = m3
Answer: a

35. A beaker is filled with a liquid up to the mark of one litre and weighed. The weight of the liquid is found to be 6.5 N. The specific gravity of the liquid will be
a) 0.65
b) 0.66
c) 0.67
d) 0.68
Answer: b

36. A beaker is filled with a liquid up to the mark of one litre and weighed. The weight of the liquid is found to be 6.5 N. The specific volume of the liquid will be
a) 1 l =kg
b) 1:5 l =kg
c) 2 l =kg
d) 2:5 l =kg
Answer: b

37. Calculate the specific weight and weight of 20dm3 of petrol of specific gravity 0.6.
a) 5886,117.2
b) 5886,234.2
c) 11772,117.2
d) None of the mentioned
Answer: a

38. If 200m3 of fluid has a weight of 1060N measured on the planet having acceleration due to gravity 6.625m/s2, what will be it's specific volume?
a) 0.8
b) 0.7
c) 0.9
d) 0.5
Answer: a

39. For an incompressible fluid does density vary with temperature and pressure?
a) It varies for all temperature and pressure range
b) It remains constant
c) It varies only for lower values of temperature and pressure
d) It varies only for higher values of temperature and pressure
Answer: b

40. Specific gravity is what kind of property?
a) Intensive
b) Extensive
c) None of the mentioned
d) It depends on external conditions
Answer: a

41. If there is bucket full of oil and bucket full of water and you are asked to lift them, which one of the two will require more effort given that volume of buckets remains same?
a) Oil bucket
b) Water bucket
c) Equal effort will be required to lift both of them
d) None of the mentioned
Answer: b

42. If the fluid has specific weight of 10N/m3 for a volume of 100dm3 on a planet which is having acceleration due to gravity 20m/s2 , what will be its specific weight on a planet having acceleration due to gravity 4m/s2?
a) 5 N/m3
b) 50 N/m3
c) 2 N/m3
d) 10 N/m3
Answer: c

43. Should Specific Weight of incompressible fluid only be taken at STP?
a) Yes, as specific weight may show large variation with temperature and pressure
b) No, it can be taken for any temperature and pressure
c) It should be taken at standard temperature but pressure may be any value
d) It should be taken at standard pressure but temperature may be any value
Answer: b

44. Water flows between two plates of which the upper one is stationary and the lower one is moving with a velocity V. What will be the velocity of the fluid in contact with the upper plate?
a) V
b) N/2
c) 2V
d) 0
Answer: d

45. The viscous force the relative motion between the adjacent layers of a fluid in motion.
Which one of the flowing fits best in the sentence?
a) opposes
b) never affects
c) facilitates
d) may effect under certain conditions
Answer: a

46. The viscosity of a fluid in motion is 1 Poise. What will be it's viscosity (in Poise) when the fluid is at rest?
a) 0
b) 0.5
c) 1
d) 2
Answer: c

47. Which of the following correctly states how the viscosities of a liquid and a gas will change with temperature?
a) Viscosity increases with the increase in temperature of a liquid and decreases with the increase in temperature of a gas
b) Viscosity increases with the increase in temperature of a liquid and increases with the increase in temperature of a gas
c) Viscosity decreases with the increase in temperature of a liquid and decreases with the increase in temperature of a gas
d) Viscosity decreases with the increase in temperature of a liquid and increases with the increase in temperature of a gas
Answer: a

48. Which one of the following is not a unit of dynamic viscosity?
a) Pa-s
b) N-s/m2
c) Poise
d) Stokes
Answer: d

49. Which of the following is a unit of dynamic viscosity?
a) [M1 L1 T-1].
b) [M1 L-1 T-1].
c) [M1 L-2 T-2].
d) [M1 L-2 T-2].
Answer: b

50. Which one of the following is the CGS unit of dynamic viscosity?
a) Stokes
b) Pa-s
c) m2/s
d) Poise
Answer: d

51. The dynamic viscosity of a fluid is 1 Poise. What should one multiply to it to get the answer in N-s/m2?
a) 0.1
b) 1
c) 10
d) 100
Answer: a

52. Poise = 1 dyne-s/cm2
9. Which of the following is a unit of kinematic viscosity?
a) Stokes
b) Pa-s
c) m2=s
d) Poise
Answer: a

53. Which of the following is the dimension of kinematic viscosity?
a) [L1 T-1].
b) [L1 T-2].
c) [L2 T-1].
d) [L2 T-2].
Answer: c

54. The kinematic viscosity of a fluid is 0.1 Stokes. What will be the value is m2/s?
a) 10-2
b) 10-3
c) 10-4
d) 10-5
Answer: d

55. Which of the following contribute to the reason behind the origin of surface tension?
a) only cohesive forces
b) only adhesive forces
c) neither cohesive forces nor adhesive forces
d) both cohesive forces and adhesive forces
Answer: d

56. What will be the diameter (in mm) of a water droplet, the pressure inside which is 0.05 N/cm2 greater than the outside pressure? (Take surface tension as 0.075 N/m)
a) 3
b) 0.3
c) 0.6
d) 6
Answer: c

57. A soap bubble of d mm diameter is observed inside a bucket of water. If the pressure inside the bubble is 0.075 N/cm2, what will be the value of d? (Take surface tension as 0.075 N/m)
a) 0.4
b) 0.8
c) 1.6
d) 4
Answer: b

58. A liquid jet of 5 cm diameter has a pressure difference of N/m2. (Take surface tension as 0.075 N/m)
a) 12
b) 6
c) 3
d) 1.5
Answer: d

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02 – Hydrostatics	Marks:-10

Content of Chapter:-

2.1 Variation of pressure with depth ,Pressure diagram —concept and use.
2.2 Total hydrostatic pressure and center of pressure on immersed surfaces and on tank walls.
2.3 Determination of total pressure and center of pressure on vertical, inclined and horizontal immersed surfaces.
2.4 Determination of total pressure and center of pressure on sides and bottom of water tanks, sides and bottom of tanks containing two liquids, vertical surface in contact with liquid on either side.

59. Which one of the following is the unit of pressure?
a) N
b) N/m
c) N/m2
d) N/m3
Answer: c

60. A point in a fluid flow where the flow has come to rest is called _____
a) Pressure point
b) Initial point
c) Flow point
d) Stagnation point
Answer: d

61. A beaker contains water up to a height of h. What will be the location of the centre of pressure?
a) h⁄3 from the surface
b) h⁄2 from the surface
c) 2h⁄3 from the surface
d) h⁄6 from the surface
Answer: c

62. Hydrostatic pressure on a dam depends upon its
a) Length
b) Depth
c) Shape
d) Both (b) and (c)
Answer: d

63. A cuboidal beaker is half filled with water. By what percent will the hydrostatic force on one of the vertical sides of the beaker increase if it is completely filled?
a) 100
b) 200
c) 300
d) 400
Answer: c

64. By what factor will the hydrostatic force on one of the vertical sides of a beaker decrease if the height of the liquid column is halved?
a) 1/2
b) 1/3
c) 1/4
d) 2/3
Answer: c

65. Equal volume of two liquids of densities ρ1 and ρ2 are poured into two identical cuboidal beakers. The hydrostatic forces on the respective vertical face of the beakers are F1 and F2 respectively. If ρ1 > ρ2, which one will be the correct relation between F1 and F2?
a) F1 > F2
b) F1 ≥ F2
c) F1 < F2
d) F1 ≤ F2
Answer: a

66. Which of the following is the correct relation between centroid (G) and the centre of pressure (P) of a plane submerged in a liquid?
a) G is always below P
b) P is always below G
c) G is either at P or below it.
d) P is either at G or below it.
Answer: d

67. A beaker contains water up to a height of h. What will be the location of the centre of pressure?
a) h/3 from the surface
b) h/2 from the surface
c) 2h/3 from the surface
d) h/6 from the surface
Answer: c

68. A cubic tank is completely filled with water. What will be the ratio of the hydrostatic force exerted on the base and on any one of the vertical sides?
a) 1:1
b) 2:1
c) 1:2
d) 3:2
Answer: b

69. A rectangular lamina of width b and depth d is submerged vertically in water, such that the upper edge of the lamina is at a depth h from the free surface. What will be the expression for the depth of the centre of pressure?
a) h+d3×2h+d3h+2d
b) h+d6×3h+2dh+2d
c) h+d3×3h+2d2h+d
d) h+d3×3h+2dh+d
Answer: c

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70. A square lamina (each side equal to 2m) is submerged vertically in water such that the upper edge of the lamina is at a depth of 0.5 m from the free surface. What will be the total water pressure (in kN) on the lamina?
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a) 19.62
b) 39.24
c) 58.86
d) 78.48
Answer: c

71. A Hydraulic press has a ram of 30 cm diameter and a plunger of of 2 cm diameter. It is used for lifting a weight of 35 kN. Find the force required at the plunger.
a) 233.3 kN
b) 311.1 kN
c) 466.6 kN
d) 155.5 kN
Answer: d

72. The pressure at a point in the fluid is 4.9 N/cm2. Find height when the fluid under consideration is in oil of specific gravity of 0.85.
a) 5.83 m
b) 11.66 m
c) 17.49 m
d) 8.74 m
Answer: a

73. An open tank contains water upto a depth of 350 cm and above it an oil of specific gravity 0.65 for a depth of 2.5 m. Find the pressure intensity at the extreme bottom of the tank.
a) 5.027 N/cm2
b) 10.05 N/cm2
c) 2.51 N/cm2
d) None of the mentioned
Answer: a

74. The diameters of a small piston and a large piston of a hydraulic jack are 45 mm and 100 mm respectively.Force of 0.09 kN applied on smaller in size piston. Find load lifted by piston if smaller in size piston is 40 cm above the large piston. The density of fluid is 850 kg/m3
a) 60 N/cm2
b) 12 N/cm2
c) 30 N/cm2
d) None of the mentioned
Answer: a

75. If fluid is at rest in a container of a narrow mouth at a certain column height and same fluid is at rest at same column height in a container having broad mouth, will the pressure be different at certain depth from fluid surface.
a) Pressure will be same for both.
b) Pressure will be more for narrower mouth
c) Pressure will be less for narrower mouth
d) None of the mentioned
Answer: a

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76. We can draw Mohr's circle for a fluid at rest.
a) True
b) false
Answer: b

77. Pressure intensity or force due to pressure gradient for fluid at rest is considered as which kind of force?
a) Surface force
b) Body force
c) Force due to motion
d) None of the mentioned
Answer: a

78. Calculate the hydrostatic pressure for water moving with constant velocity at a depth of 5 m from the surface.
a) 49 kN/m2
b) 98 kN/m2
c) since fluid is in motion, we cannot analyse
d) None of the mentioned
Answer: a

79. Pressure distribution for fluid at rest takes into consideration pressure due to viscous force.
a) True
b) False
Answer: b

80. Barometer uses the principle of fluid at rest or pressure gradient for its pressure calculation.
a) True
b) False
Answer: a

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03 – Fluid Flow Parameters	Marks:-12

Content of Chapter:-

3.1 Types of flow — Gravity and pressure flow, Laminar -Turbulent -Uniform - Non-uniform —Steady-Unsteady flow.
3.2 Reynold's number
3.3 Discharge and its unit, continuity equation of flow.
3.4 Energy of flowing liquid: potential, kinetic and pressure energy.
3.5 Bernoulli's theorem : statement, assumptions, equation and modified Bernoulli's theorem.

81. Does total pressure takes into the account force exerted by the fluid when it is in the dynamic motion?
a) Yes
b) No
c) Depends on the conditions
d) Depends on the type of Motion
Answer:b

82. Can centre of pressure for a vertical plane submerged surface be ever be above centre of Gravity
a) Yes
b) No
c) It can be above in cases where the surface height is very large
d) None of the mentioned
Answer: b

83. Which principle is used for calculating the centre of pressure?
a) Principle of momentum
b) Principle of conservation of energy
c) Principle of balancing of momentum
d) None of the mentioned
Answer: c

84. In a vertically submerged plane surface, pressure at evbery point remains same
a) True
b) False
Answer: b

85. The magnitude of total pressure and centre of pressure is independent on the shape of the submerged plane surface.
a) True
b) False
Answer: b

86. What is the variation of total pressure with depth for any submerged surface if we neglect variation in the density?
a) Linear
b) Parabolic
c) Curvilinear
d) Logarithmic
Answer: a

87. A pipe line which is 6 m in diameter contains a gate valve. The pressure at the centre of the pipe is 25 N/cm2. If the pipe is filled with specific gravity 0.8, find the force exerted by the oil upon the gate.
a) 7.06 MN
b) 14.12 MN
c) 3.53 MN
d) 28.24 MN
Answer: a

88. Determine the centre of pressure on an isosceles triangle plate of base 6m and altitude 6m when it is immersed vertically in an oil of specific gravity 0.75. The base of the plate coincides with the free surface of oil.
a) 6 m
b) 3 m
c) 9 m
d) 12 m
Answer: b

89. A tank contains water upto a height of 0.5 m above the base. An immiscible liquid of specific gravity 0.75 is filled on the top of water upto 1.5 m height. Calculate total pressure on side of the tank.
a) 17780.61 N/m2
b) 35561.22 N/m2
c) 71122.44 N/m2
d) 8890.31 N/m2
Answer: a

90. A circular opening, 6m diameter, in a vertical side of a tank is closed by a disc of 6m diameter which can rotate about a horizontal diameter. Calculate the force on the disc. The centre of circular opening is at the depth of 5 m.
a) 1.38 MN
b) 2.76 MN
c) 5.54 MN
d) 7.85 MN
Answer: a

91. Which method is used exclusively in fluid mechanics?
a) Lagrangian method
b) Eulerian method
c) Both Lagrangian and Eulerian methods
d) Neither Lagrangian nor Eulerian method
Answer: b

92. What type of flow can be taken for granted in a pipe of a uniform cross-section?
a) steady
b) unsteady
c) uniform
d) non-uniform
Answer: c

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93. Can the flow inside a nozzle be steady and uniform?
a) yes
b) never
c) it can be steady but never uniform
d) it can be uniform but never steady
Answer: c

94. Which of the following statements is true regarding one and two-dimensional flows?
a) Flow in a pipe is always taken as one-dimensional flow
b) Flow in a pipe is always taken as two-dimensional flow
c) Flow in a pipe is taken as one-dimensional flow when average flow parameters are considered
d) Flow in a pipe is taken as two-dimensional flow when average flow parameters are considered
Answer: c

95. Which of the following is true?
a) Flow is rotational inside the boundary layer and irrotational outside
b) Flow is irrotational inside the boundary layer and rotational outside
c) Flow is rotational both inside and outside of the boundary layer
d) Flow is irrotational both inside and outside of the boundary layer
Answer: a

96. Which of the following is true?
a) Flow is laminar inside the boundary layer and turbulent outside
b) Flow is turbulent inside the boundary layer and laminar outside
c) Flow is laminar both inside and outside of the boundary layer
d) Flow is turbulent both inside and outside of the boundary layer
Answer: a

97. “The velocity of entrance and exit through a nozzle remains the same.” Is this ever possible?
a) only if the flow is compressible
b) only if the flow is laminar
c) only if the flow is rotational
d) never possible
Answer: a

98. Three flows named as 1,2 and 3 are observed. The Reynold’s number for the three are 100, 1000 and 10000. Which of the flows will be laminar?
a) only 1
b) only 1 and 2
c) 1, 2 and 3
d) only 3
Answer: b

100. Three flows named as 1,2 and 3 are observed. The flow velocities are v1 and v2. If all other geometrical factors remain the same along with the fluid considered, flow is more likely to be laminar?
a) flow 1 if v1 > v2
b) flow 2 if v1 > v2
c) always flow 1
d) always flow 2
Answer: a

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101. What will be the shape of the pathline for an one-dimensional flow be like?
a) straight line
b) parabolic
c) hyperbolic
d) elliptical
Answer: a

102. Which of the following is correct?
a) Pathlines of two particles in an one-dimensional flow can never intersect
b) Pathlines of two particles in an one-dimensional flow can never intersect if the two particles move along the same direction
c) Pathlines of two particles in an one-dimensional flow can intersect only if the two particles move along the same direction
d) Pathlines of two particles in an one-dimensional flow can intersect only if the two particles move along different directions
Answer: c

103. What is the maximum number of times the pathlines of two particles can intersect in an one dimensional flow?
a) 0
b) 1
c) 2
d) infinite
Answer: b

104. The velocity of a point in a flow is
a) along the streamline
b) tangent to the streamline
c) along the pathline
d) tangent to the pathline
Answer: b

105. If a liquid enters a pipe of diameter d with a velocity v, what will it's velocity at the exit if the diameter reduces to 0.5d?
a) v
b) 0.5v
c) 2v
d) 4v
Answer: d

106. The continuity equation is based on the principle of
a) conservation of mass
b) conservation of momentum
c) conservation of energy
d) conservation of force
Answer: a

107. Two pipes of diameters d1 and d2 converge to form a pipe of diameter d. If the liquid flows with a velocity of v1 and v2 in the two pipes, what will be the flow velocity in the third pipe?
a) d1v1+d2v2d
b) d2(v1+v2)d
c) (d1+d2)2(v1+v2)d2
d) d21v1+d22v2d2
Answer: d

108. Two pipes of diameters d1 and d2 converge to form a pipe of diameter 2d. If the liquid flows with a velocity of v1 and v2 in the two pipes, what will be the flow velocity in the third pipe?
a) v1 + v2
b) v1 + v2/2
c) v1 + v2/4
d) 2(v1 + v2)
Answer: c

109. Two pipes, each of diameter d, converge to form a pipe of diameter D. What should be the relation between d and D such that the flow velocity in the third pipe becomes double of that in each of the two pipes?
a) D = d
b) D = 2d
c) D = 3d
d) D = 4d
Answer: a

110. Which of the following is NOT a type of force considered in the Navier-Stokes equation?
a) Gravity force
b) Pressure force
c) Surface tension force
d) Viscous force
Answer: c

111. Which of the following equations is a result of momentum conservation for inviscid steady flows?
a) Bernoulli's equation
b) Navier-Stokes equation
c) First law of thermodynamics
d) Euler's equation
Answer: d

112. The Bernoulli's equation in fluid dynamics is valid for _____
a) Compressible flows
b) Transient flows
c) Continuous flows
d) Viscous flows
Answer: c

113. A water flows through a pipe at a velocity 2 m/s. The pressure gauge reading is 2 bar. The datum head is given to be 2 m. Find the piezometric head. (Assume all Bernoulli's assumptions, Density of water = 1000 kg/m3, g = 9.8 m/s2).
a) 22.4 m
b) 22.6 m
c) 20.4 m
d) 20.6 m
Answer: a

114. A student wishes to find the velocity of air flowing through a pipe. He has a pressure gauge which displays only the dynamic pressure. The pressure gauge reads 0.018 mm Hg. Assume density of air to be 1.225 kg/m3, find the velocity V of air (ρHg = 13600 kg/m3).
a) 4 m/s
b) 2 m/s
c) 20 m/s
d) 40 m/s
Answer: b

115. If compressibility force and surface tension force are neglected from the Newton's second law of motion, which of the following equations result?
a) Navier-Stokes equation
b) Euler's equation
c) Bernoulli's equation
d) Reynolds equation
Answer: d

116. What does a pitot tube measure? Upon which principle does a pitot tube work?
a) Pressure, Bernoulli's principle
b) Velocity, Bernoulli's principle
c) Pressure, Euler's equation
d) Velocity, Euler's equation
Answer: a

117. The Orificemeter readings are more accurate than Venturimeter.
a) True
b) False
Answer: b

118. The Orificemeter readings are more accurate than Pitot tube readings.
a) True
b) False
Answer: b

119. The Orificemeter has a smooth edge hole.
a) True
b) False
Answer: b

120. A nanometre is connected to a section which is at a distance of about 4 to 6 times the pipe diameter upstream from orifice plate.
a) True
b) False
Answer: b

121. Venturimeter is based on integral form of Euler's equation.
a) True
b) False
Answer: a

122. Orifice Meter can only be used for measuring rate of flow in open pipe like structure.
a) True
b) False
Answer: a

121. Orifice meter consists of a flat rectangular plate.
a) True
b) False
Answer: b

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122.The Orificemeter readings are more accurate than Venturimeter.
a) True
b) False
Answer: b

123. The Orificemeter readings are more accurate than Pitot tube readings.
a) True
b) False
Answer: b

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04 – Flow Through Pipes	Marks:-14

Content of Chapter:-

4.1 Major head loss in pipe friction loss and its computation by Darcy Weisbach equation hf = (flv^2/2gd)
4.2 Minor losses in pipe: loss at entrance, exit, sudden contraction, sudden enlargement and fittings.
4.3 Flow through pipes in series, pipes in parallel and Dupit's equation for equivalent pipe.
4.4 Hydraulic gradient line and total energy line.
4.5 Water hammer in pipes : causes and Remedial measures.
4.6 Use of Moody's Diagram and Nomograms.
4.7 Discharge measuring device for pipe flow: Venturimeter-construction and working.
4.8 Discharge measuring for a tank: using Orifice, Hydraulic Coefficients of Orifice.

124. Which one of the following is a major loss?
a) frictional loss
b) shock loss
c) entry loss
d) exit loss
Answer: a

125. Which property of the fluid accounts for the major losses in pipes?
a) density
b) specific gravity
c) viscosity
d) compressibility
Answer: c

126. The frictional resistance for fluids in motion is
a) proportional to the velocity in laminar flow and to the square of the velocity in turbulent flow
b) proportional to the square of the velocity in laminar flow and to the velocity in turbulent flow
c) proportional to the velocity in both laminar flow and turbulent flow
d) proportional to the square of the velocity in both laminar flow and turbulent flow
Answer: a

127. The frictional resistance for fluids in motion is
a) dependent on the pressure for both laminar and turbulent flows
b) independent of the pressure for both laminar and turbulent flows
c) dependent on the pressure for laminar flow and independent of the pressure for turbulent flow
d) independent of the pressure for laminar flow and dependent on the pressure for turbulent flow
Answer: b

128. The frictional resistance for fluids in motion is
a) inversely proportional to the square of the surface area of contact
b) inversely proportional to the surface area of contact
c) proportional to the square of the surface area of contact
d) proportional to the surface area of contact
Answer: d

129. The frictional resistance for fluids in motion varies
a) slightly with temperature for both laminar and turbulent flows
b) considerably with temperature for both laminar and turbulent flows
c) slightly with temperature for laminar flow and considerably with temperature for turbulent flow
d) considerably with temperature for laminar flow and slightly with temperature for turbulent flow
Answer: d

130. Which one of the following is correct?
a) the frictional resistance depends on the nature of the surface area of contact
b) the frictional resistance is independent of the nature of the surface area of contact
c) the frictional resistance depends on the nature of the surface area of contact for laminar flows but is independent of the nature of the surface area of contact for turbulent flows
d) the frictional resistance is independent of the nature of the surface area of contact for laminar flows but depends on the nature of the surface area of contact for turbulent flows
Answer: d

131. Which one of the following is correct?
a) the frictional resistance is always dependent on the nature of the surface area of contact
b) the frictional resistance is always independent of the nature of the surface area of contact
c) the frictional resistance is dependent on the nature of the surface area of contact when the liquid flows at a velocity less than the critical velocity
d) the frictional resistance is independent of the nature of the surface area of contact when the liquid flows at a velocity less than the critical velocity
Answer: d

132. Which one of the following is correct?
a) Darcy-Weisbach's formula is generally used for head loss in flow through both pipes and open channels
b) Chezy's formula is generally used for head loss in flow through both pipes and open channels
c) Darcy-Weisbach's formula is generally used for head loss in flow through both pipes and Chezy's formula for open channels
d) Chezy's formula is generally used for head loss in flow through both pipes and Darcy-Weisbach's formula for open channels
Answer: c

133. A liquid flows through pipes 1 and 2 with the same flow velocity. If the ratio of their pipe diameters d1 : d2 be 3:2, what will be the ratio of the head loss in the two pipes?
a) 3:2
b) 9:4
c) 2:3
d) 4:9
Answer: c

134. A liquid flows through two similar pipes 1 and 2. If the ratio of their flow velocities v1 : v2 be 2:3, what will be the ratio of the head loss in the two pipes?
a) 3:2
b) 9:4
c) 2:3
d) 4:9
Answer: d

135. A liquid flows with the same velocity through two pipes 1 and 2 having the same diameter. If the length of the second pipe be twice that of the first pipe, what should be the ratio of the head loss in the two pipes?
a) 1:2
b) 2:1
c) 1:4
d) 4:1
Answer: a

136. The head loss at the entrance of the pipe is that at it's exit
a) equal to
b) half
c) twice
d) four times
Answer: b

137. On which of the factors does the co-efficent of bend in a pipe depend?
a) angle of bend and radius of curvature of the bend
b) angle of bend and radius of the pipe
c) radius of curvature of the bend and pipe
d) radius of curvature of the bend and pipe and angle of bend
Answer: d

138. Energy gradient line takes into consideration
a) potential and kinetic heads only
b) potential and pressure heads only
c) kinetic and pressure heads only
d) potential, kinetic and pressure heads
Answer: d

139. Hydraulic gradient line takes into consideration
a) potential and kinetic heads only
b) potential and pressure heads only
c) kinetic and pressure heads only
d) potential, kinetic and pressure heads
Answer: b

140. Which of the following is true?
a) EGL always drops in the direction of c
b) EGL always rises in the direction of flow
c) EGL always remains constant in the direction of flow
d) EGL may or may not in the direction of flow
Answer: a

141. Which of the following is true?
a) HGL always drops in the direction of flow
b) HGL always rises in the direction of flow
c) HGL always remains constant in the direction of flow
d) HGL may or may not in the direction of flow
Answer: d

142. Which of the following is true?
a) HGL will never be above EGL
b) HGL will never be under EGL
c) HGL will never coincide with EGL
d) HGL will may or may not be above EGL
Answer: a

143. The vertical intercept between EGL and HGL is equal to
a) pressure head
b) potential head
c) kinetic head
d) Piezometric head
Answer: c

144. The slope of HGL will be
a) greater than that of EGL for a pipe of uniform cross-section
b) smaller than that of EGL for a pipe of uniform cross-section
c) equal than that of EGL for a pipe of uniform cross-section
d) independent of that of EGL for a pipe of uniform cross-section
Answer: c

145. For a nozzle, the vertical intercept between EGL and HGL
a) increases
b) decreases
c) remains constant
d) may increase or decrease
Answer: a

146. For a diffuser, the vertical intercept between EGL and HGL
a) increases
b) decreases
c) remains constant
d) may increase or decrease
Answer: b

147. Which of the following is true?
a) the slope of EGL will always be greater than that of the axis of the pipe
b) the slope of EGL will always be smaller than that of the axis of the pipe
c) the slope of EGL will always be equal to that of the axis of the pipe
d) the slope of EGL will always be independent of that of the axis of the pipe
Answer: d

148. The liquid flowing through a series of pipes can take up_____
a) Pipes of different diameters
b) Pipes of the same diameters only.
c) Single pipe only
d) Short pipes only
Answer: a

149. What is the total loss developed in a series of pipes?
a) Sum of losses in each pipe only
b) Sum of local losses only
c) Sum of local losses plus the losses in each pipe
d) Zero
Answer: c

150. The total head loss for the system is equal to_____
a) Pipe length
b) Pipe diameter
c) Width of the reservoir
d) Height difference of reservoirs
Answer: d

151. Which among the following is not a loss that is developed in the pipe?
a) Entry
b) Exit
c) Connection between two pipes
d) Liquid velocity
Answer: d

152. Which among the following is the correct formula for head loss?
a) Z1-Z2
b) C
c) T2-T1
d) S2-S1
Answer: a

153. If the two reservoirs are kept at the same level, the head loss is _____
a) Z1-Z2
b) Zero
c) T2-T1
d) S2-S1
Answer: b

154. How do we determine the total discharge through parallel pipes?
a) Add them.
b) Subtract them
c) Multiply them
d) Divide them
Answer: a

155. The pipe diameter is _____
a) Directly proportional to fluid density
b) Directly proportional to mass flow rate
c) Inversely proportional to mass flow rate
d) Directly proportional to fluid velocity
Answer: b

156. Define Viscosity.
a) Resistance to flow of object
b) Resistance to flow of air
c) Resistance to flow of fluid
d) Resistance to flow of heat
Answer: c

157. Coefficient of friction of a laminar flow is_____
a) Re/16
b) Re/64
c) 16/Re
d) 64/Re
Answer: c

158. Where is a water hammer developed?
a) Reservoir
b) Penstock
c) Turbine blades
d) Pipe line
Answer: b

159. Which among the following is true for hydroelectric power plants?
a) Operating cost is low and initial cost is high
b) Both operating and initial cost are high
c) Both operating and initial cost are low
d) Operating cost is high and initial cost is low
Answer: a

160. The power output of the turbine in a hydroelectric plant depends on_____
a) Type of dam and its system efficiency
b) Discharge and system efficiency
c) Type of turbine and type of dam
d) Type of turbine and area of the reservoir
Answer: b

161. Water hammer is developed in which power plant?
a) Solar
b) Nuclear
c) Hydro
d) Wind
Answer: c

162. Which among the following are commercial sources of energy?
a) Solar energy
b) Animal wastes
c) Agricultural wastes
d) Wood
Answer: a

163. Which is the most suitable place to build a hydroelectric power plant?
a) Deserts
b) Grasslands
c) Hilly areas
d) Underground
Answer: c

164. In a hydroelectric power plant, where is the penstock used?
a) Between dam and the turbine
b) Between turbine and discharge drain
c) Turbine and heat exchanger
d) Heat exchanger and fluid pump
Answer: a

165. Which among the following is used as a regulating reservoir?
a) Reservoir
b) Spillways
c) Forebay
d) Penstock
Answer: c

166. Gross head is defined as_____
a) Difference of flow of object
b) Difference of flow of air
c) Difference of flow of water
d) Difference of water level between the head race and tail race
Answer: d

167. What is the function of a surge tank?
a) It causes water hammer
b) Produces surge in the pipeline
c) Relieves water hammer
d) Supplies water at constant pressure
Answer: c

168. Hydro-graph is a graph that shows_____
a) Load curve
b) Energy curve
c) Mass curve
d) Volume curve
Answer: a

169. What is the function of a pump storage scheme?
a) Improve power factor
b) Improve mass factor
c) Improve plant capacity factor
d) Improve volume factor
Answer: c

170. When is orifice called ‘large orifice’?
a) If the head of liquid is less than 5 times the depth of orifice
b) If the head of liquid is less than 2.5 times the depth of orifice
c) If the head of liquid is less Hence, 4 times the depth of orifice
d) If the head of liquid is less than 1.5 times the depth of orifice
Answer: a

171. In case of any orifice, velocity always remains constant and hence discharge can be calculated.
a) True
b) False
Answer: b

172. Find the discharge through a rectangular orifice 2.2 m wide and 1.3 m deep fitted to a easier tank. The water level in a team is 2.5 m above the top edge of orifice.
a) 13.9 m3/s
b) 11.5 m3/s
c) 16.9 m3/s
d) 8.7 m3/s
Answer: a

173. Find the discharge through a rectangular orifice 3.2 m wide and 1.7 m deep fitted to a easier tank. The water level in a team is 3.3 m above the top edge of orifice. Take Cd = 0.6
a) 29.4 m3/s
b) 58.5 m3/s
c) 67.9 m3/s
d) 78.7 m3/s
Answer: a

174. Find the discharge through totally drowned orifice of width 2.3 m if the difference of water levels on both side of the orifice be 40 cm. The height of water from to and bottom of the orifice are 2.6 m and 2.75 m respectively.
a) .56 m3/s
b) .64 m3/s
c) .75 m3/s
d) .55 m3/s
Answer: a

175. Find the discharge through totally drowned orifice of width 3.3 m if the difference of water levels on both side of the orifice be 50 cm. The height of water from to and bottom of the orifice are 2.25 m and 2.67 m respectively.
a) 2.8 m3/s
b) 2.7 m3/s
c) 2.6 m3/s
d) 2.5 m3/s
Answer: a

176. A rectangular orifice of 2 m width and 1.2 m deep is fitted in one side of large tank. The easier level on one side of the orifice is 3m above the top edge of the orifice while on the other side of the orifice the water level is 0.5 m below it's top edge. Calculate discharge if Cd = .64
a) 4.95 m3/s
b) 5.67 m3/s
c) 3.56 m3/s
d) 6.75 m3/s
Answer: a

177. The time taken to empty the tank is independent of Cd but depends only on the height and acceleration due to gravity.
a) True
b) False
Answer: b

178. The discharge rate is independent of the height difference and dependent only on the height.
a) True
b) False
Answer: b

179. In case of submerged orifice the discharge is substantially dependent on temperature of fluid
a) True
b) False
Answer: b

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05 – Flow Through Open Channel	Marks:-14

Content of Chapter:-

5.1 Geometrical properties of channel section: Wetted area, wetted perimeter, hydraulic radius for rectangular and trapezoidal channel section.
5.2 Determination of discharge by Chezy's equation and Manning's equation.
5.3 Conditions for most economical rectangular and trapezoidal channel section .
5.4 Discharge measuring devices:Triangular and rectangular Notches.
5.5 Velocity measurement devices: current meter, floats and Pitot tube.
5.6 Specific energy diagram, Froude's Number, and Hydraulic.

180. The discharge and velocity of water in a rectangular channel are 75m^3/s and 5m/ s respectively. The hydraulic depth being 3m calculate the hydraulic radius.
a) 1.36m
b) 1.87m
c) 1.98m
d) 2.0m
Answer: a

181. Calculate the hydraulic diameter for a rectangular duct having 10m width and 6m depth.
a) 5.5m
b) 6.5m
c) 7.5m
d) 8.5m
Answer: c

182. The ratio of Hydraulic radius and Hydraulic depth is ½ and the top width of the channel is 6m, calculate the hydraulic depth of the channel.
a) 1m
b) 2m
c) 3m
d) 4m
Answer: c

183. The section factor of a rectangular channel is 111.80m. The discharge and velocity of water are 250 m3⁄s and 5 m⁄s respectively. Calculate the hydraulic depth of the channel.
a) 2m
b) 3m
c) 4m
d) 5m
Answer: d

184. The ratio between depth and width of a rectangular channel is ¼ and the area of the rectangular section is 16m^2. Calculate the top width of the channel.
a) 5m
b) 6m
c) 7m
d) 8m
Answer: d

186. Which geometric parameter determines the efficiency of the channel?
a) Hydraulic depth
b) Hydraulic radius
c) Section factor
d) Normal depth
Answer: b

187. A rectangular channel has depth y and top with B. Determine its section factor.
a) By3⁄2
b) By1⁄2
c) By
d) By2
Answer: a

188. Calculate the wetted area for a rectangular channel which is
5.2m in width and 3m in depth.
a) 15.6m2
b) 16.6m2
c) 17.6m2
d) 18.6m2
Answer: d

189. Calculate the wetted perimeter for a rectangular channel having top width of 4.5m and depth of 3m.
a) 12m
b) 10.5m
c) 7.5m
d) 15m
Answer: b

190. A rectangular channel has a depth of 5m and width of 12m. Calculate the hydraulic depth of the channel.
a) 5m
b) 6m
c) 7m
d) 8m
Answer: a

191. The depth and widths of a rectangular channel are 4m and 5m respectively. Determine the hydraulic radius of the channel.
a) 4.22m
b) 3.54m
c) 2.22m
d) 1.54m
Answer: d

192. Determine the section factor for the channel section having area 20m2.
a) 20m
b) 30m
c) 40m
d) 50m
Answer: b

193. The section factor and hydraulic depth for a rectangular channel are 40m and 4m respectively. Determine the top width of the channel.
a) 3m
b) 4m
c) 5m
d) 6m
Answer: c

194. The hydraulic depth of a rectangular channel is 2m and its wetted area is 12m2. Estimate its hydraulic radius.
a) 1.2m
b) 1.3m
c) 1.4m
d) 1.5m
Answer: a

195. Let the top width of a rectangular channel be B and the depth be y, determine the hydraulic radius of the channel.
a) By/ B+2y
b) By/ B+ y
c) y
d) B
Answer: a

196. What is the wetted area for a triangular channel having depth y and the side slope being Z?
a) Zy2
b) 2Zy
c) Zy
d) Z2 y
Answer: a

198. Calculate the wetted perimeter of a triangular section having depth y and the side slope is Z.
a) 2Zy
b) Zy
c) y1+Z2−−−−−−√
d) 2y1+Z2−−−−−−√
Answer: d

199. Calculate the wetted perimeter of a triangular section having a depth of 4m and the side slope is1H:1V.
a) 7.94m
b) 8.94m
c) 9.94m
d) 10.94m
Answer: b

200. Estimate the wetted area of a triangular channel having a depth of 5m and the side slope is 2H:1V.
a) 50m2
b) 60m2
c) 70m2
d) 80m2
Answer: a

201. What is the top width of a triangular channel having a depth y and side slope Z?
a) Zy
b) Zy2
c) 2Zy
d) ½Zy
Answer: c

202. Determine the hydraulic depth of a triangular channel having the side slope Z and depth y.
a) y
b) y/2
c) 2y
d) y2
Answer: b

203. Estimate the top width of a triangular channel having a side slope of 1H:2V and depth of 5m.
a) 4m
b) 5m
c) 6m
d) 7m
Answer: b

204. What is the Hydraulic Radius of a triangular channel having a depth y and side slope Z?
a) Z21+Z2√
b) y21+Z2√
c) Zy21+Z2√
d) Zy1+Z2√
Answer: c

205. What is the section factor for a triangular channel having depth y and side slope Z?
a) 2Zy522√
b) Zy522√
c) Zy5222–√
d) Zy522
Answer: c

206. Calculate the section factor a triangular channel section having side slope 1H:4V and depth of 8m.
a) 32
b) 34
c) 36
d) 38
Answer: a

207. What is the top width of a trapezoidal channel having depth y, side slope Z and base B?
a) 2Zy
b) Zy
c) B+Zy
d) B+2Zy
Answer: d

208. Calculate the hydraulic depth of a trapezoidal channel section having depth 4m, base of 5m and side slope 1H:2V.
a) 2.11m
b) 3.11m
c) 4.11m
d) 5.11m
Answer: b

209. Calculate the hydraulic radius of a trapezoidal section having depth 5m, side slope 1H:3V and base of 6m.
a) 1.32m
b) 2.08m
c) 1.08m
d) 2.32m
Answer: d

210. Calculate the section factor of a trapezoidal channel section having depth 8m, base 5m and side slope 1H:2V.
a) 139.44
b) 149.44
c) 159.44
d) 169.44
Answer: d

211. Estimate the discharge of water in a trapezoidal channel section having a depth 3m, width of 6m, side slope of 1H:2V and velocity of water is 2m⁄s.
a) 40m3⁄s
b) 45m3⁄s
c) 50m3⁄s
d) 55m3⁄s
Answer: b

212. Calculate the side slope of a trapezoidal channel section having base 8m, depth 4m and the hydraulic radius is 2.36m.
a) 1⁄6
b) 1⁄3
c) 1⁄2
d) 1⁄4
Answer: c

213. Calculate the top width of a trapezoidal channel section having a side slope1H:4V, base of 5m and the wetted area is 17.25m2.
a) 5.5m
b) 6.5m
c) 7.5m
d) 8.5m
Answer: b

214. The product Zy in a Trapezoidal channel is 2 and the side slope is1/2. Calculate the wetted perimeter of the channel section if the wetted is 32m2.
a) 13.94m
b) 14.94m
c) 15.94m
d) 16.94m
Answer: b

215. The top width of a trapezoidal channel is 12m, the bottom width of the channel is 6m and the side slope is 1H:2V, calculate the wetted perimeter.
a) 17.41m
b) 18.41m
c) 19.41m
d) 20.41m
Answer: c

216. The wetted area of a trapezoidal section is 15m^2 and the top width is 6m, calculate the section factor.
a) 23.72
b) 24.72
c) 25.72
d) 26.72
Answer: a

217. The ratio of section factor and hydraulic depth in a trapezoidal section is 324/25, calculate the top width if the total wetted area of the channel is 24m2.
a) 4m
b) 5m
c) 6m
d) 7m
Answer: d

218. Calculate the discharge through a channel having a bed slope 1 in 1000, area 12m2, hydraulic radius of 1.2m and Chezy's constant being equal to 50.
a) 17.98 m3/s
b) 18.98 m3/s
c) 19.98 m3/s
d) 20.98 m3/s
Answer: d

219. What is the dimension of C?
a) LT
b) L1/2 T-1
c) LT-1
d) L-1 T-1
Answer: b

220. The depth and widths of a rectangular channel are 2m and 5m respectively, calculate the discharge of water through the channel if the bed slope is 1 in 500 and Chezy's constant being 60.
a) 28.27 m3/s
b) 38.27 m3/s
c) 48.27 m3/s
d) 58.27 m3/s
Answer: a

221. Estimate the discharge of water through a triangular channel having depth 3m, side slope1H:2V, the bed slope is 1 in 500 and C=60.
a) 14.48 m3/s
b) 15.48 m3/s
c) 16.48 m3/s
d) 17.48 m3/s
Answer: c

222. The discharge of water through a trapezoidal channel is 1.5 m3/s, the base width of the channel is 7m, the depth is 2m and the side slope is 1H:3V. Bed slope is 1 in 2000, determine the value of the Chezy's constant.
a) 50
b) 55
c) 60
d) 65
Answer: c

223. Find the discharge through a circular channel section having diameter of 5m, the value of Chezy's constant is 90 and the bed slope is 1 in 4000.
a) 13.61 m3/s
b) 14.61 m3/s
c) 15.61 m3/s
d) 16.61 m3/s
Answer: c

224. The discharge through a rectangular channel is 16.62 m3/s and the wetted area is equal to 12m2. The width of the channel is 6m and the bed slope is 1 in 1000, calculate the value of the Chezy's constant.
a) 35
b) 40
c) 45
d) 50
Answer: b

225. Calculate the discharge through a triangular channel having a normal depth of 4m, wetted area equalling to 8m2 and having side slope and bed slopes 1/2 and 1 in 500 respectively. C = 40.
a) 13.54 m3/s
b) 14.54 m3/s
c) 15.54 m3/s
d) 16.54 m3/s
Answer: a

226. A rectangular channel is having depth 2m and width 3m, bed slope of 1 in 700. The value of manning's roughness co efficient (n) is 0.06, estimate the discharge through the channel.
a) 2.42m3⁄s
b) 3.42m3⁄s
c) 4.42m3⁄s
d) 5.42m3⁄s
Answer: b

227. Estimate the discharge through a triangular channel having depth 7m and side slope 1H:5V in which the bed slope is 1 in 1000. Manning's co efficient = 0.03.
a) 8.07m3⁄s
b) 9.07m3⁄s
c) 10.07m3⁄s
d) 11.07m3⁄s
Answer: a

228. The base width and the depth of a trapezoidal channel is 9m and 5m respectively. Calculate the discharge through a channel if the side slope of the channel is 1H:4V and the bed slope is 1 in 500. (n=0.04)
a) 109.73m3⁄s
b) 110.73m3⁄s
c) 111.73m3⁄s
d) 112.73m3⁄s
Answer: a

229. A circular channel section has diameter of 6m and it is running half. Calculate the discharge through the channel if the bed slope is 1 in 600 and manning's co efficient is equal to 0.014.
a) 52m3⁄s
b) 53m3⁄s
c) 54m3⁄s
d) 55m3⁄s
Answer: c

230.The area of the triangular section is 66.67m2 and the wetted perimeter of the section is 24.03m. Calculate the value of the manning's roughness co efficient if the bed slope of the channel section is 1 in 500 and the discharge through the channel is 117.61m3⁄s.
a) 0.03
b) 0.04
c) 0.05
d) 0.06
Answer: c

231. The discharge through a trapezoidal channel is 245.06m3⁄s and the bed slope is 1 in 1000. Calculate the value of the wetted area if the hydraulic radius is 2.26m. Manning's roughness co efficient = 0.008.
a) 34m2
b) 35m2
c) 36m2
d) 37m2
Answer: c

232. Determine the value of manning's constant for a rectangular channel if Chezy's constant is equal to 50 and the depth and widths of the channel are 4m and 7m respectively.
a) 0.012
b) 0.022
c) 0.032
d) 0.042
Answer: b

233. The side slope of a triangular channel section is 1H:4V and the depth is 12m. Calculate the value of chezy's constant if the value of manning's constant is 0.03.
a) 32.48
b) 33.48
c) 34.48
d) 35.48
Answer: d

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ZEAL EDUCATION SOCIETY PUNE ESTD-1996 ZEAL POLYTECHNIC

06 – Hydraulics Pumps	Marks:-08
Content of Chapter:- 6.1 Concept of pump, Types of pump-centrifugal, reciprocating pumps, submersible pumps. 6.2 Centrifugal pump: Component parts and working. 6.3 Reciprocating pump: single and double acting. components and working. 6.4 Suction head, Delivery head, Manometric head. 6.5 Compute power of centrifugal pump. 6.6 Selection and choice of pump.	

234. Centrifugal pump is a_____
a) Turbomachinery
b) Flow regulating device
c) Drafting device
d) Intercooling device
Answer: a

235. Turbomachines work under _____
a) Newtons first law
b) Newtons second law
c) Newtons third law
d) Kepler's law
Answer: b

236. The main function of nozzle is to _____
a) Varying temperatures
b) Pressure variations
c) Load variations
d) Heat variations
Answer: b

237. The main function of centrifugal pumps are to _____
a) Transfer speed
b) Transfer pressure
c) Transfer temperature
d) Transfer energy
Answer: d

238. Centrifugal pumps transfer energy from _____
a) Rotor to fluid
b) Fluid to rotor
c) Draft to rotor
d) Rotor to draft
Answer: a

239. Which among the following control the flow rate?
a) Valve
b) Pump
c) Head
d) Tank pipe
Answer: a

240. Turbines and compressors work with the gas, while centrifugal pump transfers energy.
a) True
b) False
Answer: a

241. The inlet passage of water entry is controlled by _____
a) Head race
b) Gate
c) Tail race
d) Pump
Answer: b

242. Centrifugal pumps are a sub class of dynamic axisymmetric work absorbing turbo machinery.
a) True
b) False
Answer: a

243. Centrifugal pumps are used to transport _____
a) Pressure
b) Speed
c) Power
d) Fluid
Answer: d

244. Centrifugal pumps transport fluids by converting _____
a) Kinetic energy to hydrodynamic energy
b) Hydrodynamic energy to kinetic energy
c) Mechanical energy to kinetic energy
d) Mechanical energy to Hydrodynamic energy
Answer: a

245. With the increase in load, Energy in the turbine_____
a) Decreases
b) Increases
c) Remains same
d) Independent
Answer: a

246. The rotational kinetic energy comes from _____
a) Engine motor
b) Pump
c) Tank
d) Draft tube
Answer: a

247. When the balancing of the turbine is disturbed, we use _____
a) Throttle governing
b) Steam governing
c) Nozzle governing
d) Emergency governing
Answer: d

248. The fluid coming into the centrifugal pump is accelerated by _____
a) Throttle
b) Impeller
c) Nozzle
d) Governor
Answer: b

249._____ pump is also called as velocity pump.
a. Reciprocating
b. Rotary displacement
c. Centrifugal
d. Screw
Answer: c

250. Discharge capacity of the reciprocating pump is _____ that of the centrifugal pump.
a) higher than
b) Lower than
c) Same as
d) unpredictable
Answer: b

251. The process of filling the liquid into the suction pipe and pump casing up to the level of delivery valve is called as _____.
a) Filling
b) Pumping
c) Priming
d) Levelling
Answer: c

252. The fluid coming into the centrifugal pump is accelerated by _____
a) Throttle
b) Impeller
c) Nozzle
d) Governor
Answer: b

253. Pump efficiency is defined as the ratio of _____
a) Pressure to temperature
b) Temperature to pressure
c) Water horsepower to pump horsepower
d) Pump horse power to water horse power
Answer: c

254. A centrifugal pump is superior to a reciprocating pump because
a) It is a high speed pump
b) It is more economical
c) It gives smooth flow
d) All the above
Answer: d

255. A turbine is a device which converts
a) Kinetic energy into mechanical energy
b) Mechanical energy into hydraulic energy
c) Hydraulic energy into mechanical energy
d) None of the above
Answer: c

256. Which of the following is not example of Impulse turbine?
a) Pelton wheel
b) Girard turbine
c) Turbo turbine
d) Francis turbine
Answer: d

257. Reaction turbine works on the principle of
a) Impulse
b) Reaction
c) Both a & b
d) None of the above
Answer: c

258. Function of Draft tube is
a) Water discharges into tail race at very low velocity
b) Increase head on turbine
c) Improves efficiency of turbine
d) All of the above
Answer: d

259. What is the unit of flow rate?
a) kg.m
b) kg/m
c) m3/s
d) /s
Answer: c

260. With the increase in the flow rate, efficiency _____
a) Decreases
b) Increases
c) Remains same
d) Independent
Answer: b

261. Pump efficiency is defined as the ratio of _____
a) Pressure to temperature
b) Temperature to pressure
c) Water horsepower to pump horsepower
d) Pump horse power to water horse power
Answer: c

262. The difference in the total head of the pump is called _____
a) Manometric head
b) Euler head
c) Pressure head
d) Shaft head
Answer: a

263. The ratio of manometric head to the work head is called _____
a) Manometric head
b) Euler head
c) Pressure head
d) Shaft head
Answer: b

264. What is the unit of energy head?
a) m
b) m/s
c) m3/s
d) /s
Answer: a

265. With the increase in energy head, efficiency _____
a) Decreases
b) Increases
c) Remains same
d) Independent
Answer: b

266. The head added by the pump is a sum of _____
a) Pressure
b) Static lift
c) Volume
d) Flow rate
Answer: b

267. Power is most commonly expressed as _____
a) m
b) kW
c) m3/s
d) /s
Answer: b

268. PHE stands for _____
a) Pump Hydraulic efficiency
b) Pressure Hydraulic efficiency
c) Power Hydraulic efficiency
d) Pump hydraulic engine
Answer: a

269. Vertical centrifugal pumps are also called as cantilever pumps.
a) True
b) False
Answer: a

270. With increase in power, the efficiency_____
a) Decreases
b) Increases
c) Remains same
d) Independent
Answer: a

271. Vertical pumps utilize unique shaft and bearing support configuration.
a) True
b) False
Answer: a

272. Which among the following is used in mineral industries?
a) Vertical pumps
b) Horizontal pumps
c) Froth pumps
d) Multistage pumps
Answer: c

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