

Future Secure Institute™

Name: F.M

MM:[75], Time:[1] hour's

Date:

Total Ques. [75]

Q1. The ratio of pressure between two point A & B at depth .5m & 2m below the level of walk & in a tank is:-

- a) 1:1 b) 1:2 c)1:4 d) 1:16

Q2. The height of water column corresponding to a pressure Equi vale of 60 cm of mercury column will be:-

- a) 816 cm b) 8160 cm c)81.6 cm d) 7996.0cm

Q3. Which is correct:-

- a) Gauge pr= abs pr + Atm pr b) abs Pr= Atm pr+Gauge pr
c)Atm pr = abs pr+Gauge pr d) Abs pr= Gauge pr+ Atm pr

Q4. Value for atm pr is:-

- a) 1.013 Bar b) 760 m m of Hg c)10.3 m of water d) All

Q5.A micro mano meter with inclined tube is called as:-

- a) in verteb manometer b) sensitive mano meter
c) closed tube mano meter d) differential manometer

Q6. For a fluid at rest :-

- a) the shear stress is only on the horizontal plane
b) the shear stress is O
c) the shear stress is max at 45° to horizontal
d) the shear stress depend on the co- efficient of viscosity

Q7.A metal piece having density equal to the density of a fluid is placed in liquid the metal piece will:-

- a) sink to the bottom b) float on the surface c) will be partly immerse d) will be fully immersed

Q8. **Match:-**

List 1

- A- M above to G
B- M below to G
C- M coincide with G

List 2

- 1) stable
2) unstable
3)Neutral

Q9. Find the buoyancy force Acting on a an Al cube which is suspended and immersed in a jar filled with water it is given that the side of cube is 5 cm :-

- a) 2.45 N b) 1.25N c) 4.56 N d) 7.34 N

Q10.when a ship travel in ship sea, which is more dangerous :-

- a) steering b) pitching c) rolling d) all

Q11. The force of buoyancy is depend on:-

- a) mass of fluid displaced b) viscosity of fluid c) surface tension of fluid d) depth of immersion

Q12. A piece of metal of sp gr 7 floats in mercury of sp. Gra 13.6 what fraction of its volume is under mercury :-

- a) .5 b).4 c).515 d) .415

Q13. Meta centric height is the distance between :-

- a) meta centre and water surface b) meta centre and centroid
c) meta centre and centre of gravity d) meta centre and centre of buoyant

Q14. The continuity equation in fluid mechanics employing the principle of :-

- a)conservation of energy b) conservation of mass c) conservational moment d) none

Q15. An ideal flow of any fluid must satisfy :-

- a) pascal's law b) new ton's low of viscosity c) boundary layer theory d) continuity equation

Q16. Continuity equation can take the form:-

- a) $A_1V_1 = A_2V_2$ b) $e_1A_1=e_2A_2$ c) $e_1A_1V_1=e_2A_2V_2$ d)none

Q17. An fluid is one which :-

- a) is in compressible b)is compressible c) has neglected surface d) is non viscous and in compressible

Q18. Continuity equation for a compressible fluids is :-

- a) $A_1v_1=A_2v_2$ b) $e_1A_1v_1=e_2A_2v_2$ c) $\frac{A_1v_1}{e_1} = \frac{A_2v_2}{e_2}$ d) $\frac{e_1A_1}{v_1} =$

Q19. What is the state, in which none of the properties of the system change with time known as:-

- a) unsteady state b) steady state c) dynamic d) Quasistatic

Q20.the general equation of continuity for three dim flow of a compressible fluid steady flow is:-

- a) $\frac{\partial \rho}{\partial x} + \frac{\partial v}{\partial y} + \frac{\partial w}{\partial z} = 0$ b) $\frac{\partial \rho}{\partial x} + \frac{\partial v}{\partial y} + \frac{\partial w}{\partial z} = 1$ c) $\frac{\partial \rho}{\partial x} = \frac{\partial v}{\partial y} = \frac{\partial w}{\partial z} = 0$ d)none

Q21.the term $\frac{v^2}{2g}$ is :-

- a) kinetic energy b) pressure energy c) kinetic energy/unit weight

Q22. Piezometer is used to measure :-

- a) pressure in pipe, channel etc b) Atmospheric pressure
c) very low pressure d)difference of pressure between two points

Q23. In a pipe, flow of fluid take place from:-

- a) high to low level b) high pr to low pr
c) high to low energy d) low level to high level

Q24. The velocity of fluid flowing through the diver gent portion of a ventarir:-

- a)increase b) decrease c) const d) none

Q25. Bernoulli's equation can be derived from :-

- a) continuity equation b) Newton's law of viscosity c) Reynolds theorem d) Euler's equation

Q26. In Pitot tube the velocity of flow at a point is reduced to 0. That point is called as:-

- a) stagnation point b) critical point c) meta centre d) equilibrium

Q27. A liquid flows from level z_1 , pressure P_1 to a higher level z_2 , pressure it can be concluded:-

- a) 1st law of thermodynamics violated b) 2nd law of thermodynamics violated c) $z_2 < z_1$ d) $P_2 < P_1$

Q28. Each term in Bernoulli's equation stated in the form $\frac{p}{\rho} + \frac{v^2}{2g} + z = \text{const.}$:-

- a) N b) MN/kg c) M d) MN/S

Q29. The length of converging section of venturi meter is:-

- a) $2.7(D-d)$ b) $2.7(D+d)$ c) 2.7 d) none

Q30. A Rotameter is a device used to measure:-

- a) velocity b) velocity of gauge c) Rotameter flow d) Flow of Fluids

Q31. Coefficient of discharge, C_d is equal to :-

- a) $C_v \times C_c$ b) $C_v \times C_r$ c) $C_v + C_c$ d) $C_v - C_v$

Q32. A venturi meter is preferred to an orifice plate because:-

- a) it's cheaper b) it's easy to install c) energy loss is less d) it has very high life

Q33. In laminar, incompressible flow in a circular pipe, the ratio between Avg velocity and max velocity would be:-

- a) $\frac{1}{2}$ b) $\frac{1}{3}$ c) $\frac{2}{3}$ d) $\frac{1}{\sqrt{2}}$

Q34. An oil with sp.gr. .85 and viscosity 3.8 poise flows in a 5cm dia horizontal pipe at $2 \frac{m}{s}$. The Reynolds no will be:-

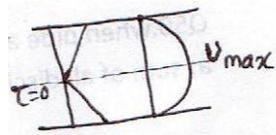
- a) 224 b) 2240 c) 22.4 d) 22400

Q35. Water at 20°C is flowing through a 20 cm dia pipe. Take kinematic viscosity of water at 20°C = 0.0101 stoke. Assume that the flow changes from laminar to turbulent at $Re = 2320$. The critical velocity will be:-

- a) $1117 \frac{cm}{s}$ b) $.117 \frac{cm}{s}$ c) $1.117 \frac{cm}{s}$ d) $111.7 \frac{cm}{s}$

Q36. What can definitely be said about the tube flow in the diagram below :-

- a) turbulent flow b) compressible flow c) laminar flow d) incompressible flow



Q37. Nature of flow is determined by:-

- a) Mach no. b) Froude no c) Reynolds no d) Weber's no

Q38. For laminar flow in a pipe, velocity is:-

- a) U_{max} b) $5 U_{max}$ c) $25 U_{max}$ d) $2 U_{max}$

Q39. discharge of rectangular notch is:-

- a) $Q \propto H^{3/2}$ b) $Q \propto H^{5/2}$ c) $Q \propto \frac{1}{H^{3/2}}$ d) $Q \propto \frac{1}{H^{5/2}}$

Q40. discharge of rectangular notch is:-

- a) $\frac{2}{3} cd L H^{3/2}$ b) $\frac{8}{15} cd L H^{3/2}$ c) $\frac{2}{3} cd \sqrt{2g} H^{3/2}$ d) none

Q41. discharge of Triangular notch is:-

- a) $Q \frac{2}{3} cd \tan \frac{\theta}{2} \sqrt{2g H}$ b) $Q \frac{8}{15} cd \tan \frac{\theta}{2} \sqrt{2g H^{5/2}}$
c) $Q \frac{2}{3} cd \tan \frac{\theta}{2} \sqrt{2g H^{3/2}}$ d) none

Q42. To find small discharge, which is used :-

- a) rectangular notch b) Trapezoidal notch c) Triangular notch d) all

Q43. Hammer Blow in pipe occurs due to:-

- a) sudden sharp bend b) sudden contraction
c) sudden stop of flow d) sudden release of fluid from pipe

Q44. the friction factor for turbulent flow through pipe varies as:-

- a) $\frac{1}{Re}$ b) $\frac{1}{Re^{.5}}$ c) $\frac{1}{Re^{.3}}$ d) $\frac{1}{Re^{.25}}$

Q45. head loss in sudden expansion is:-

- a) $v_1^2 - v_2^2 / 2g$ b) $(v_1 - v_2)^3 / 2g$ c) $(v_1 - v_2)^2 / 2g$ d) $2(v_1 - v_2)^2 / 2g$

Q46. for the viscous flow the co-efficient of friction is:-

- a) $f = \frac{8}{Re}$ b) $f = \frac{16}{Re}$ c) $f = \frac{32}{Re}$ d) $f = \frac{60}{Re}$

Q47. Frictional factor of pipes depend on:-

- a) rate of flow b) fluid density c) viscosity d) all

Q48. If velocity of flow through a pipes is doubled, the head loss due to friction becomes:-

- a) 2 times b) 4 times c) 8 times d) half

Q49. The velocity distribution in a pipe flow is parabolic if the flow is:-

- a) uniform turbulent b) uniform laminar c) non-uniform, steady d) rotational, compressible

Q50. when pipe are in series then discharge :-

- a) sum of all discharge b) equal in all pipe c) not equal d) none

Q51. Hydraulic mean depth is:-

- a) $\frac{A}{p}$ b) $\frac{P}{A}$ c) $\frac{A}{N}$ d) None

Q52. for max power, transmission through a pipe line, the friction head loss is:

- a) $\frac{H}{2}$ b) $\frac{3H}{5}$ c) $\frac{H}{4}$ d) $\frac{H}{3}$

Q53. Two pipe systems are said to be equivalent when in two systems:

- a) Friction factor and length are same
b) length and diameter same
c) head loss and discharge are same
d) length of pipe and discharge are same

Q54. The frictional loss of a pipe varies approximately as:-

- a) v b) v^2 c) \sqrt{v} d) $v^{3/2}$

Q55. The shear stress in a fluid flowing in a round pipe:-

- a) is constant over the cross-section b) is zero at the wall and increases linearly to the centre
c) is zero at the wall and varies linearly with radius d) varies parabolically across the section

Q56. Reynold's number is the ratio of inertia force to:-

- a) Gravitational force b) surface tension c) Elasticity d) viscous force

Q57. Velocity distribution for turbulent flow is:-

- a) logarithmic b) Blasius equation c) power law d) Prandtl's $\frac{1}{7}$ th law

Q58. The ratio of inertia force to surface tension is:-

- a) Mach number b) Froude number c) Reynolds number/diameter d) Weber's number

Q59. Match:-

List 1

- 1- compressible flow
2- Free surface flow
3. Boundary layer flow
4. pipe flow
5. Heat convection

List 2

- a) Reynold's No
b) Nusselt No
c) Weber No
d) Froude No
e) Mach No
f) Skin friction coefficient

- a) A-1, B-4, C-2, D-6, E-3,
c) A-5, B-3, C-6, D-1, E-4

- b) A-3, B-4, C-6, D-1, E-2
d) A-5, B-3, C-6, D-1, E-2

Q60. Euler's number is related to inertia to:-

- a) gravity force b) viscous force c) pressure force d) Buoyancy

Q61. match list -1 with list 2 and select the correct answer using the codes given below the lists:-

List-1

- A) Dynamic viscosity B) moment of momentum
 c)power d)volume modulus of elasticity

List-2

1. ML^2T^{-3}
2. $ML^{-1}T^{-2}$
3. $ML^{-1}T^{-1}$
4. ML^2T^{-2}
5. ML^2T^{-1}

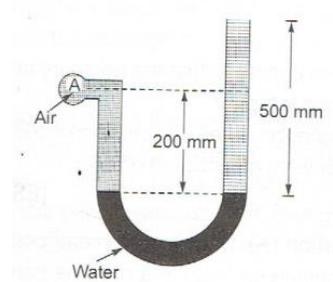
Codes:-

	A	B	C	D
a)	1	4	2	3
b)	3	5	1	2
c)	1	5	2	3
d)	3	4	1	2

Q62. The pressure inside a soap bubble of 50 mm diameter is 25 N/m² above the atmospheric pressure. The surface tension in soap film would be:-

- a) 0.156N/m b)0.312N/m c)0.624N/m d)0.078N/m

Q63.in the figure shown below , air is contained in the pipe and water in the manometer liquid:-



The pressure at A is approximately

- a) 10.14 m of water absolute
 b)0.2 m of water

- c) 1.2 m of water vacuum
d) 4901 Pa

Q64. In a differential manometer a head of 0.6 m of fluid A in limb 1 is found to balance a head of 0.3 m of fluid B in limb 2. The ratio of specific gravities of A to B is:-

- a) 2 b) 0.5 c) 0.3 d) 0.185

Q65. If the stream function is given by $\phi = 3xy$, then the velocity at a point (2,3) will be:-

- a) 7.21 unit b) 10.82 unit c) 18 unit d) 54 unit

Q66. The condition in which Bernoulli's equation applies are:-

- 1) the flow must be inviscid 2) the fluid may be compressible or incompressible
3) the flow must be steady 4) there should be only one stream line in the flow
a) 1,2,3 and 4 b) 1,2 and 3 only c) 1,3 and 4 only d) 2,3 and 4 only

Q67. Match List-1 with List -2 and select the correct answer using the code given below the lists:-

List-1

- A) Rotameter
B) venturimeter
C) orifice-meter
D) flow nozzle

List -2

1. vena contracta
2. Tapering tube
3. Convergent divergent
4. Bell mouth entry

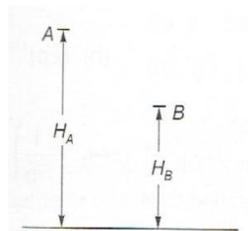
Codes:-

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

Q68. If H is the head at inlet and h is the head lost due to friction, efficiency of power transmission through a straight pipe is given by:

- a) $\frac{H-h}{H}$ b) $\frac{H}{H+h}$ c) $\frac{H-h}{H+h}$ d) $\frac{H}{H-h}$

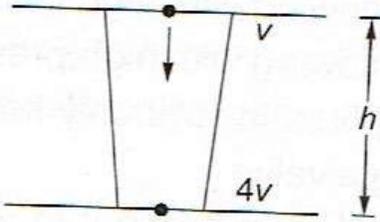
Q69. Point A of head H_A is at a higher elevation than point B of head H_B the head loss between these points is H_L the flow takes place:-



- a) always from A to B
b) from A to B if $H_A = H_B + H_L$
c) from B to A if $H_A + H_L = H_B$

d) from B to A if $H_B + H_L = H_A$

Q70. A liquid flows downward through a tapered vertical portion of a pipe. At the entrance and exit of the pipe, the static pressures are equal. If for a vertical height 'h' the velocity becomes four times, then the ratio of 'h' the velocity head at entrance will be:-



- a) 3 b) 8 c) 15 d) 24

Q71. In a turbulent flow, L is the Prandtl's mixing length and $\frac{\partial \bar{u}}{\partial Y}$ is the gradient of the average velocity in the direction to flow. The final expression for the turbulent viscosity ν_t is given by:-

- a) $\nu_t = L(\partial \bar{u} | \partial Y)$ b) $\nu_t = \frac{1}{L^2}(\partial \bar{u} | \partial Y)$ c) $\nu_t = L^2(\partial \bar{u} | \partial Y)$ d) $\nu_t = \frac{1}{L}(\partial \bar{u} | \partial Y)$

Q72. The friction factor for fully developed turbulent flow through a rough circular pipe depends on:-

- a) Reynolds number
 b) relative roughness
 c) Reynolds number and relative roughness
 d) Reynolds number, relative roughness and diameter to length ratio

Q73. Match List-1 with List-2 and select the correct answer using the codes given below the lists:-

List-1

- A) compressibility force
 B) Gravity force
 C) surface tension force
 D) viscous force

List-2

1. Euler number
 2. Froude number
 3. Mach number
 4. Reynolds number
 5. Weber number

Codes:-

- | | A | B | C | D |
|----|---|---|---|---|
| a) | 1 | 2 | 3 | 4 |
| b) | 3 | 2 | 5 | 4 |
| c) | 3 | 1 | 4 | 2 |
| d) | 2 | 3 | 5 | 1 |

Q74. Euler number is defined as the ratio of inertia force to:-

- a) viscous force b) elastic force c) pressure force d) gravity force

Q75. In the boundary layer, the flow is:-

- a) viscous and rotational b) inviscid and irrotational
 c) inviscid and rotational d) viscous and irrotational