

**University of Mumbai**  
**Examination 2020 under cluster 8 (Lead College: PHCET, Rasayani)**

Program: **Automobile Engineering**

Curriculum Scheme: Rev 2012 / 2016

Examination: Second Year Semester IV

Course Code: AEC402 and Course Name: Fluid Mechanics

Time: 1 hour

Max. Marks: 50

For the students:- All the Questions are compulsory and carry equal marks .

Q1.	According to Archimede's principle, if a body is immersed partially or fully in a fluid then the buoyancy force is _____ the weight of fluid displaced by the body.
Option A:	equal to
Option B:	less than
Option C:	more than
Option D:	unpredictable
Q2.	What is the correct formula for absolute pressure?
Option A:	$P_{abs} = P_{atm} - P_{gauge}$
Option B:	$P_{abs} = P_{vacuum} - P_{atm}$
Option C:	$P_{abs} = P_{vacuum} + P_{atm}$
Option D:	$P_{abs} = P_{atm} + P_{gauge}$
Q3.	One litre of a certain fluid weighs 8N. What is its specific volume?
Option A:	$2.03 \times 10^{-3} \text{ m}^3/\text{kg}$
Option B:	$20.3 \times 10^{-3} \text{ m}^3/\text{kg}$
Option C:	$12.3 \times 10^{-3} \text{ m}^3/\text{kg}$
Option D:	$1.23 \times 10^{-3} \text{ m}^3/\text{kg}$
Q4.	Which type of body is an airfoil?
Option A:	streamline body
Option B:	wave body
Option C:	bluff body
Option D:	induced body
Q5.	The sum of components of shear forces in the direction of flow of fluid is called as
Option A:	shear drag
Option B:	friction drag
Option C:	skin drag
Option D:	all of the above
Q6.	Boundary layer thickness is the distance from the boundary to the point where velocity of the fluid is
Option A:	equal to 10% of free stream velocity
Option B:	equal to 50% of free stream velocity
Option C:	equal to 90% of free stream velocity

Option D:	equal to 99% of free stream velocity
Q7.	The specific weight of the fluid depends upon
Option A:	gravitational acceleration
Option B:	mass density of the fluid
Option C:	both a. and b.
Option D:	none of the above
Q8.	Navier- Stokes equation describes the motion of _____
Option A:	Solid substance
Option B:	Non-viscous fluid
Option C:	Viscous fluid
Option D:	Gas
Q9.	What is the velocity profile for Poiseuille flow?
Option A:	Zero
Option B:	Constant
Option C:	Linear
Option D:	Quadratic
Q10.	What is the incompressibility condition in Navier-Stokes equation?
Option A:	$\nabla \cdot \mathbf{u} = 0$
Option B:	$\nabla \cdot \mathbf{u} > 0$
Option C:	$\nabla \cdot \mathbf{u} < 0$
Option D:	$\nabla \cdot \mathbf{u} = 1$
Q11.	The value of the Bulk Modulus of an ideal fluid is
Option A:	zero
Option B:	unity
Option C:	infinity
Option D:	less than that of a real fluid
Q12.	The value of the surface tension of an ideal fluid is
Option A:	zero
Option B:	unity
Option C:	infinity
Option D:	more than that of a real fluid
Q13.	Which is the cheapest device for measuring flow / discharge rate.
Option A:	Venturimeter
Option B:	Pitot tube
Option C:	Orificemeter
Option D:	None of the mentioned
Q14.	What is the correct formula for loss at the exit of a pipe?
Option A:	$h_L = 0.5 (V^2 / 2g)$
Option B:	$h_L = (V^2 / 2g)$
Option C:	$h_L = (2 V^2 / g)$

Option D:	$h_L = (4 V^2 / g)$
Q15.	Minor losses occur due to
Option A:	sudden enlargement in pipe
Option B:	sudden contraction in pipe
Option C:	bends in pipe
Option D:	all of the above
Q16.	What is Darcy-Weisbach formula for heat loss due to friction? Where, $f$ = Darcy's coefficient of friction
Option A:	$h_f = (f l V^2) / (g d)$
Option B:	$h_f = (f l V^2) / (2 g d)$
Option C:	$h_f = (4 f l V^2) / (2 g d)$
Option D:	$h_f = (16 f l V^2) / (2 g d)$
Q17.	What is the ratio of maximum velocity to average velocity, when the fluid is passing through two parallel plates and flow is laminar?
Option A:	3/2
Option B:	2/3
Option C:	4/3
Option D:	3/4
Q18.	Which of the following is the correct relation between centroid (G) and the centre of pressure (P) of a plane submerged in a liquid?
Option A:	G is always below P
Option B:	P is always below G
Option C:	G is either at P or below it.
Option D:	P is either at G or below it.
Q19.	If stream function ( $\Psi$ ) satisfies the Laplace equation, it is a possible case of
Option A:	a circular flow
Option B:	a rotational flow
Option C:	an irrotational flow
Option D:	none of the above
Q20.	In a steady, ideal flow of an incompressible fluid, total energy at any point of the fluid is always constant. This theorem is known as
Option A:	Euler's theorem
Option B:	Navier-stockes theorem
Option C:	Reynold's theorem
Option D:	Bernoulli's theorem
Q21.	When the net force acting on a fluid is the sum of only gravity force, pressure force and viscous force, the equation is called as
Option A:	Reynold's equation of motion
Option B:	Navier-stockes equation of motion
Option C:	Euler's equation of motion
Option D:	none of the above

Q22.	The net force of an ideal flow is equal to the sum of nonzero values of
Option A:	pressure force and gravity force
Option B:	viscous force and gravity force
Option C:	pressure force and viscous force
Option D:	pressure force, viscous force and compressibility force
Q23.	Which of the following forces generally act on fluid while considering fluid dynamics? 1. Viscous force 2. Pressure force 3. Gravity force 4. Turbulent force 5. Compressibility force
Option A:	(1), (3), (4) and (5)
Option B:	(1), (2), (3) and (5)
Option C:	(1), (2), (3) and (4)
Option D:	(1), (2), (3), (4) and (5)
Q24.	The rate of increase of velocity with respect to change in the position of fluid particle in a flow field is called as
Option A:	local acceleration
Option B:	temporal acceleration
Option C:	convective acceleration
Option D:	all of the above
Q25.	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?
Option A:	1:1
Option B:	2:1
Option C:	1:2
Option D:	3:2