MTH642 Quiz#1

Topic (1-44)

Due Date (23-25)Dec2021

- Mth642 quiz 1.Silent 25dec2021 pg20
- MTH642 Quiz 1 Solved 25dec2021 pg20
- Mth642 Quiz.1 by (KING) 25dec2021 pg20
- Mth642.quiz 1.moeez 25dec2021 pg20
- Mth642 Quiz.1.By (KING of KING) 25dec2021 pg30
- Mth642 quiz 1 25dec2021 pg10
- Mth642 quiz 1 Solved 25dec2021 pg10
- Camscanner 12-25-2021 pg40
- Mth642 Quiz#1 (1to41)(25dec2021) Made by Stylish pg20
- Mth642 quiz 1 from 3 groups 25dec2021 pg1263
- Mth 642 Verified25dec2021 pg102

MTH642

MID Term Grand Quiz All in 1 File

Lec (1-22), Topic (1-75)

- MTH642 Quiz#1 All in 1 File2021 pg87

Objective (8 files)

Files (27june2021)

- Mth642 solved G.Quiz pg53
- MTH642 solved 27june2021 pg53
- M@!!k Mth642 grand quiz correct solution pg103
- MTH642 grand quiz correct solution by moeez pg103
- MTH642 grand quiz correct solution by moeez 27june2021 pg58
- Mth642 mega midterm quiz file(searchable by sahir) pg428
- Mth642 grand quiz pg210

Subjective (5 files)

- Subj Paper mth642 2021 Solved By Moin pg4
- Mth 642 mid solve paper-converted pg3
- mth 642 book quiz-converted pg8
- Mth 642 Imp Coordinates-converted pg2
- Mth642 mid paper jan2022

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MTH642 Quiz#1

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 3 of 10 (Start time: 07:37:02 AM, 24 December 2021)

Which on of the following is **NOT** the unit of viscosity?

Select the correct option

○	$kgms^{-2}$ ✔
○	Nsm^{-2}
◉	poise
○	Pa.s

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 6 of 10 (Start time: 07:39:29 AM, 24 December 2021)

The flow of low-viscosity fluids at high velocities is typically _____.

Select the correct option

○	none of these
○	laminar
○	transitional
◉	turbulent

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 7 of 10 (Start time: 07:40:07 AM, 24 December 2021)

_____ is the measure of internal thickness of the fluid.

Select the correct option

○	Stress
◉	Viscosity ✓
○	Volume
○	Momentum

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MTH642 - Fluid Mechanics (Quiz 1) Quiz Start Time: 07:35 AM, 24 December 2021

Question # 2 of 10 (Start time: 07:36:45 AM, 24 December 2021) Total Marks: 1

Fully developed velocity profile V=V(r) represents _____

Select the correct option

Reload Math Equations

◉	one dimensional flow
○	two dimensional flow
○	three dimensional flow
○	dimensionless flow

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 10 of 10 (Start time: 04:58:28 PM, 25 December 2021)

The fluid velocity _____ with depth.

Select the correct option

○	has no relation
○	increases ✓
○	decreases
○	remains constant

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 7 of 10 (Start time: 08:16:50 PM, 25 December 2021)

The dimension of area is _____.

Select the correct option

- ○ L^{-2}
- ○ L^{2} ✓
- ○ L^{-1}
- ○ L^{3}

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Question # 4 of 10 (Start time: 04:48:51 PM, 25 December 2021)

Which property allows us to assume that the properties vary continuously in space without any jump discontinuities?

Select the correct option

- ○ Volume
- ○ Pressure
- ○ Continuum ✓
- ○ Density

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 1 of 10 (start time: 04:55:44 PM, 25 December 2021)

The magnitude of the drag force depends on _____.

Select the correct option

○	the velocity of the flow
○	the viscosity of the flow ✓
○	the pressure of the flow
○	the momentum of the flow

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Question # 10 of 10 (Start time: 04:00:32 PM, 25 December 2021)

At which vertical distance, the pressure in a fluid will be minimum while assuming that the fluid is at rest?

Select the correct option

○	10m
○	20m
○	7m ✓
○	9m

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 8 of 10 (Start time: 04:40:14 PM, 25 December 2021)

Which of the following is **NOT** an internal flow?

Select the correct option

○	hot gas flow in a duct
○	unbounded fluid flow over the surface of a wire ✓
○	liquid flow between the two parallel plates
○	water flow in a pipe

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 10 of 10 (Start time: 04:41:29 PM, 25 December 2021)

The term **transient** is used for _____.

Select the correct option

○	steady flow
○	developing flow ✓
○	unsteady flow
○	any flow

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 9 of 10 (Start time: 03:38:31 PM, 25 December 2021)

If at any point the fluid properties change with respect to time, then the flow is termed as _____.

Select the correct option

- unsteady flow
- uniform flow
- steady flow
- nonuniform flow

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 5 of 10 (Start time: 03:56:42 PM, 25 December 2021)

The quantity of matter or the region in space chosen for study is defined as _____

Select the correct option

- ○ boundary
- ○ system ✓
- ○ imaginary surface
- ○ surrounding

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MTH542 - Fluid Mechanics (Quiz 1) Quiz Start Time: 03:53 PM, 25 December 2021

Question # 6 of 10 (Start time: 03:57:50 PM, 25 December 2021) Total Marks: 1

Fluid flows between two parallel plates. Assume that the lower plate is at rest while upper one is moving with a constant velocity V. The velocity of the fluid in contact with the lower plate is _____

Select the correct option

Reload Math Equations

○	2V
○	V/2
○	zero ✓
○	V

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 8 of 10 (Start time: 03:37:39 PM, 25 December 2021)

A closed system can also be referred as _____.

Select the correct option

○	isolated system
○	control volume
○	control mass ✓
○	international system

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 2 of 10 (Start time: 09:00:31 PM, 25 December 2021)

The no slip condition happens due to _____

Select the correct option

○	pressure
○	density
○	velocity ✓
○	viscosity

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 4 of 10 (Start time: 04:58:26 PM, 25 December 2021)

Surface tension is defined as _____.

Select the correct option

○	force per unit length ✓
○	momentum per unit length
○	viscosity per unit length
○	stress per unit length

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Question # 6 of 10 (start time: 05:11:50 PM, 25 December 2021)

At which vertical distance, the pressure in a fluid will be maximum while assuming that the fluid is at rest?

Select the correct option

- 7m
- 9m ✓
- 8m
- 6m

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 2 of 10 (Start time: 07:59:55 PM, 25 December 2021)

Stress is defined as _____.

Select the correct option

○	force per unit area ✓
○	momentum per unit area
○	work done per unit area
○	fluid flow per unit area

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MTH642 - Fluid Mechanics (Quiz1)

Question # 2 of 10 (Start time: 06:35:40 PM, 25 December 2021)

The unit of velocity is _____.

Select the correct option

○	ms
○	$m^{-1}s$
○	$m^{-1}s^{-1}$
○	ms^{-1} ✓

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 10 of 10 (Start time: 07:13:09 PM, 25 December 2021)

_____ is the secondary dimension.

Select the correct option

- Energy ✓
- Temperature
- Length
- Time

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MTH642 – Fluid Mechanics (Quiz 1)

Question # 3 of 10 (Start time: 09:55:02 PM, 25 December 2021)

If the fluid is at rest, then which of the following will be zero?

Select the correct option

- (●) shear stress
- ( ) pressure
- ( ) normal stress
- ( ) stress

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 8 of 10 (Start time: 05:23:53 PM, 25 December 2021)

In steady flow, _____

Select the correct option

- ○ properties gradually change with time.
- ○ velocity does not change
- ○ pressure changes
- ○ properties do not change with time ✓

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 10 of 10 (Start time: 05:26:08 PM, 25 December 2021)

In a steady flow, the fluid properties _____ at any fixed point.

Select the correct option

○	vary
○	remain constant ✓

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 7 of 10 (Start time: 09:24:55 PM, 25 December 2021)

Surface tension comes into act due to the _____ between the molecules of the liquids.

Select the correct option

○	spaces
○	attractive forces ✓
○	velocity difference
○	energy difference

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 8 of 10 (Start time: 05:01:05 PM, 25 December 2021)

Which of the following is a Newtonian fluid?

Select the correct option

○	Liquid plastics
○	Gasoline ✓
○	Blood
○	Toothpaste

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 3 of 10 (Start time: 03:33:01 PM, 25 December 2021)

The acceleration of the fluid particle is given by_____.

Select the correct option

○	$a_{particle}=dP_{particle}/dt$
○	$a_{particle}=dT_{particle}/dt$
○	$a_{particle}=dV_{particle}/dt$ ✓
○	$a_{particle}=dx_{particle}/dt$

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 5 of 10 (Start time: 10:57:37 PM, 25 December 2021)

An open system can also be referred as _____.

Select the correct option

○	international system
○	control mass
◉	control volume
○	isolated system

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 6 of 10 (Start time: 10:58:00 PM, 25 December 2021)

Can a body weighing 150 lbf on earth will weigh only 25 lbf on the moon?

Select the correct option

◉	Yes 
○	No

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Question # 9 of 10 (Start time: 10:58:50 PM, 25 December 2021)

By Newton's second law, the net force acting on the fluid particle is given as the product of its_____ and_____.

Select the correct option

○	pressure, velocity
○	velocity, time
○	acceleration, time
◉	mass, acceleration ✓

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MTH542 - Fluid Mechanics (Quiz 1) Quiz Start Time: 10:56 PM, 25 December 2021

Question # 2 of 10 (Start time: 10:57:00 PM, 25 December 2021) Total Marks: 1

The _____ is commonly used to replace pumps by placing the water tank sufficiently above the solar collectors.

Select the correct option

Reload Math Equations

○	Compton effect
○	thermal effect
○	buoyancy effect
○	thermosiphoning effect ✓

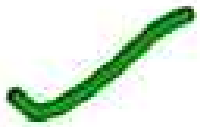
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MTH642 - Fluid Mechanics (Quiz 1)

Question # 3 of 10 (Start time: 10:57:10 PM, 25 December 2021)

The friction between the fluid layers causes the fluid velocity to

Select the correct option

◉	decrease 
○	increase

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Question # 4 of 10 (Start time: 10:57:24 PM, 25 December 2021)

The three terms **acceleration of a fluid particle, local acceleration and advective acceleration** can be related as

Select the correct option

○	acceleration of a fluid particle = local acceleration - advective acceleration
○	acceleration of a fluid particle = local acceleration × advective acceleration
○	acceleration of a fluid particle = local acceleration / advective acceleration
◉	acceleration of a fluid particle = local acceleration + advective acceleration ✓

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 7 of 10 (Start time: 10:48:48 PM, 25 December 2021)

Which of the following is called **the local acceleration**?

Select the correct option

○	dV/dt
○	DV/Dt
○	$\Delta V/\Delta t$
◉	$\partial V/\partial t$ ✓

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MTH642 – Fluid Mechanics (Quiz 1)

Question # 9 of 10 (Start time: 10:50:11 PM, 25 December 2021)

Can a body weighing 150 lbf on earth will weigh only 25 lbf on the moon?

Select the correct option

○	No
○	Yes



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MTH642 - Fluid Mechanics (Quiz 1)

Question # 10 of 10 (Start time: 10:50:58 PM, 25 December 2021)

In _____, each fluid particle follows the identical path.

Select the correct option

○	fluid flow
○	laminar flow
◉	turbulent flow
○	developing flow

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 4 of 10 (Start time: 10:47:56 PM, 25 December 2021)

If a fluid is at rest, then shear stress equals to_____.

Select the correct option

◉	zero 
○	none of these
○	pressure
○	normal stress

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 3 of 10 (Start time: 10:47:04 PM, 25 December 2021)

Viscosity is caused by _____.

Select the correct option

○	cohesive forces between the molecules in liquids
○	friction force develops between two fluid layers when they move
○	All ✓
○	molecular collisions in gases

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 4 of 10 (Start time: 10:40:36 PM, 25 December 2021)

Which of the following statement(s) is/are true?

1. A liquid does not form a free surface.
2. Gas expands to fill the entire available space.

Select the correct option

◉	1 and 2 both ✓
○	Neither 1 nor 2
○	2 only
○	1 only

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 9 of 10 (Start time: 10:42:40 PM, 25 December 2021)

The local acceleration will be zero for

Select the correct option

○	unsteady flow
○	steady flow 

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 1 of 10 (Start time: 10:45:44 PM, 25 December 2021)

Flow having significant frictional effects is termed as _____.

Select the correct option

◉	viscous flow ✓
○	inviscid flow
○	external flow
○	internal flow

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 5 of 10 (Start time: 10:34:50 PM, 25 December 2021)

The flow is _____ for Mach number less than one.

Select the correct option

◉	subsonic
○	supersonic
○	sonic
○	hypersonic.

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 6 of 10 (Start time: 10:35:43 PM, 25 December 2021)

The are _____ primary dimensions.

Select the correct option

○	six
○	seven ✓
○	five
○	eight

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MTH642 - Fluid Mechanics (Quiz 1) **Quiz Start Time:**

Question # 2 of 10 (Start time: 10:40:05 PM, 25 December 2021)

The Greek mathematician Archimedes applied _____ to determine the gold content of the crown of King Hiero.

Select the correct option

○	the law of conservation of mass
◉	the buoyancy principle ✓
○	the gravity principle
○	the law of conservation of momentum

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 7 of 10 (Start time: 10:30:26 PM, 25 December 2021)

By definition, the acceleration of the fluid particle is the time derivative of __

Select the correct option

○	the fluid's pressure
◉	the fluid's velocity ✓
○	the fluid's momentum
○	the fluid's displacement

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 10 of 10 (Start time: 10:32:18 PM, 25 December 2021)

The advective acceleration is given by _____.

Select the correct option

○	$V \bullet \nabla$
○	$\nabla \bullet V$
◉	$(V \bullet \nabla)V$ ✓
○	$\partial V / \partial t$

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 1 of 10 (Start time: 10:33:58 PM, 25 December 2021)

For fluid at rest, the shear stress is

Select the correct option

○	undefined
○	maximum
◉	zero ✓
○	minimum

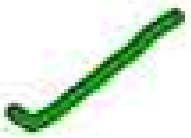
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MTH642 - Fluid Mechanics (Quiz 1)

Question # 5 of 10 (Start time: 10:28:57 PM, 25 December 2021

The number of significant digits in 1.500 is

Select the correct option

○	3
○	1
◉	4 
○	2

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 6 of 10 (Start time: 10:29:43 PM, 25 December 2021)

In which direction, the pressure will not change if the fluid is at rest?

Select the correct option

○	direction along the negative slop
○	vertical direction
○	direction along the positive slop
○	horizontal direction ✓

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 3 of 10 (Start time: 10:21:08 PM, 25 December 2021)

The substance in liquid or gas phase is referred as

Select the correct option

○	ions
◉	fluid 
○	electrolyte
○	plasma

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 5 of 10 (Start time: 10:21:44 PM, 25 December 2021)

Which of the following is **NOT** a drived dimension?

Select the correct option

○	Velocity
○	Length ✓
○	Volume
◉	Area

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 10 of 10 (Start time: 10:24:35 PM, 25 December 2021)

Which of the following statements is/are true?
1: Solids can resist applied shear stress by deforming.
2: liquids cannot resist applied shear stress and continuously deform.

Select the correct option

○	2 only
○	nether 1 nor 2
◉	both 1 and 2 ✓
○	1 only

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 4 of 10 (Start time: 10:28:16 PM, 25 December 2021)

In inviscid flow region, the viscous forces are negligibly small compared to____.

Select the correct option

○	Both (a) and (c)
◉	Inertial or pressure forces ✓
○	gravitational forces
○	buoyant forces

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Question # 8 of 10 (Start time: 10:16:32 PM, 25 December 2021)

The pressure applied to a confined fluid increases the pressure throughout by the same amount. This law is known as _____

Select the correct option

Reloc

○	Euler's law
○	Pascal's law
◉	Newton's law
○	Ohm's Law

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 1 of 10 (Start time: 10:20:45 PM, 25 December 2021)

The flow regions in which the frictional effects are negligible are termed as _____ flow regions.

Select the correct option

○	external
◉	inviscid
○	viscous
○	internal

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 2 of 10 (Start time: 10:20:56 PM, 25 December 2021)

The boundary layer is developed very close to the wall by flowing fluid due to _____.

Select the correct option

○	Gravity
◉	Viscosity
○	Density
○	Surface Tension

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Question # 2 of 10 (Start time: 10:12:03 PM, 25 December 2021)

In what type of flow, the mass, volume and energy content of the flow section do not change?

Select the correct option

- ○ Steady flow ✓
- ○ Uniform flow
- ○ Nonuniform flow
- ○ Unsteady flow

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Question # 5 of 10 (Start time: 10:13:54 PM, 25 December 2021)

A fluid flow is classified as viscous or inviscid flow region, depending on_____.

Select the correct option

○	internal stress of the fluid
○	fluid momentum
◉	frictional effects between the layers of the fluid 
○	internal temperature of the fluid

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Question # 6 of 10 (Start time: 10:14:41 PM, 25 December 2021)

In which of the following system, the amount of mass is fixed and no mass and even energy can cross its boundary?

Select the correct option

○	International system
○	Open system
○	Closed system 
○	Isolated system

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 9 of 10 (Start time: 10:07:04 PM, 25 December 2021)

A flow may be approximated _____ when the aspect ratio is large.

Select the correct option

○	three-dimensional
○	one-dimensional
○	zero-dimensional
○	two-dimensional ✓

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 10 of 10 (Start time: 10:07:44 PM, 25 December 2021)

If a normal force of one newton is exerted by the fluid per unit area, then the pressure will be _____

Select the correct option

○	1 atm
○	1 bar
○	1kgf /cm^2
◉	1 Pa

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 1 of 10 (Start time: 10:10:50 PM, 25 December 2021)

In which of the following, the rate of deformation is proportional to the shear stress?

Select the correct option

◉	Newtonian fluids ✓
○	Dilatant
○	Pseudoplastics
○	Bingham Plastics

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MTH642 – Fluid Mechanics (Quiz 1)

Question # 9 of 10 (Start time: 09:56:58 PM, 25 December 2021)

Barometer is a device used to measure _____.

Select the correct option

◉	atmospheric pressure ✓
○	partial pressure
○	saturation pressure
○	vapor pressure

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 10 of 10 (Start time: 09:57:15 PM, 25 December 2021)

If there is no change with location over a specified region then the flow is termed as _____

Select the correct option

◉	steady flow
○	unsteady flow
○	nonuniform flow
○	uniform flow 

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Question # 3 of 10 (Start time: 10:04:09 PM, 25 December 2021)

The pressure exerted by the vapor of a pure substance in phase equilibrium with its liquid at given temperature is called __

Select the correct option

Rel

○	vapor pressure
○	saturation pressure
○	partial pressure
◉	atmospheric pressure

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 4 of 10 (Start time: 10:04:26 PM, 25 December 2021)

The number of significant digits in 10.660 is _____.

Select the correct option

○	2
○	4
◉	5 ✓
○	3

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MTH642 – Fluid Mechanics (Quiz 1)

Question # 7 of 10 (Start time: 09:55:44 PM, 25 December 2021)

The mathematical form of fluid properties, velocity (V) and density (ρ), in unsteady flow is _

Select the correct option

◉	$\frac{\partial V}{\partial t} \neq 0$ and $\frac{\partial \rho}{\partial t} \neq 0$
○	$\frac{\partial V}{\partial t} \neq 0$ and $\frac{\partial \rho}{\partial t} = 0$
○	$\frac{\partial V}{\partial t} = 0 = \frac{\partial \rho}{\partial t}$
○	$\frac{\partial V}{\partial t} = 0$ and $\frac{\partial \rho}{\partial t} \neq 0$

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 8 of 10 (Start time: 09:56:04 PM, 25 December 2021)

Manometer is a device used to measure _____.

Select the correct option

○	volume differences
○	velocity differences
○	pressure differences ✓
○	energy differences

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 3 of 10 (Start time: 09:52:48 PM, 25 December 2021)

If density is defined as mass per unit volume then what will be the specific volume?

Select the correct option

○	volume × unit mass
○	volume + unit mass
○	volume - mass
◉	volume / unit mass

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 4 of 10 (Start time: 09:53:04 PM, 25 December 2021)

Which one of the following is **NOT** a secondary dimension?

Select the correct option

◉	Temperature ✓
○	Acceleration
○	Momentum
○	Velocity

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 6 of 10 (Start time: 09:55:28 PM, 25 December 2021)

One-, Two- and Three-Dimensional flows are characterized by _____.

Select the correct option

○	energy distribution
○	mass distribution
◉	velocity distribution ✓
○	momentum distribution

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MTH642 - Fluid Mechanics (Quiz 1) Quiz Start Time: 09:39 PM, 25 December 2021

Question # 10 of 10 (Start time: 09:47:41 PM, 25 December 2021) Total Marks: 1

Fluid flows between two parallel plates. Assume that the lower plate is at rest while upper one is moving with a constant velocity V. According to no-slip condition, the relative velocity of the fluid in contact with the upper plate is _____

Select the correct option

Reload Math Equations

○	2V
○	zero
○	V/2
○	V ✓

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 1 of 10 (Start time: 09:51:12 PM, 25 December 2021)

The fluid forced to flow in a confined channel is classified as being _____.

Select the correct option

○	natural flow
◉	viscous flow
○	internal flow ✓
○	compressible flow

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 2 of 10 (Start time: 09:51:35 PM, 25 December 2021)

Viscosity is a measure of internal _____ of the fluid.

Select the correct option

◉	thickness ✓
○	stress
○	momentum
○	temperature

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MTH642 – Fluid Mechanics (Quiz 1)

Question # 3 of 10 (Start time: 09:40:53 PM, 25 December 2021)

Which of the following may **NOT** have a free surface?

Select the correct option

○	An open container filled with water
○	An open container filled with hydrogen gas ✓
○	An open container filled with oil
○	An open container filled with liquid mercury

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 6 of 10 (Start time: 09:43:28 PM, 25 December 2021)

The developing velocity profile **V(r,z)** represents _____.

Select the correct option

○	one dimensional flow
○	three dimensional flow
○	dimensionless flow
◉	two dimensional flow ✓

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 9 of 10 (Start time: 09:46:55 PM, 25 December 2021)

Which one of the following is **NOT** a primary dimension?

Select the correct option

○	Time
○	Area
○	Length
○	Mass

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 2 of 10 (Start time: 09:40:05 PM, 25 December 2021)

For unsteady flows the local acceleration will be

Select the correct option

○	zero
◉	nonzero

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 6 of 10 (Start time: 10:48:32 PM, 25 December 2021)

Which of the following is an extensive property?

Select the correct option

○	Density
○	Pressure
◉	Total mass
○	Temperature

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 5 of 10 (Start time: 10:48:17 PM, 25 December 2021)

In solids stress is proportional to strain but in fluids stress is proportional to strain rate.

Select the correct option

○	False
◉	True



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MTH642 - Fluid Mechanics (Quiz 1)

Question # 9 of 10 (Start time: 08:06:18 PM, 25 December 202

Which one of the following is a primary dimension?

Select the correct option

○	Energy
○	Time ✓
○	Velocity
○	Volume

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 6 of 10 (Start time: 06:39:57 PM, 25 December 2021)

The flow having velocity $\mathbf{V} = (-y, x)$ is _____.

Select the correct option

- ○ three-dimensional
- ○ one-dimensional
- ○ zero-dimensional
- ○ two-dimensional ✓

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MTH642 - Fluid Mechanics (Quiz1)

Question # 3 of10 (start time: 06:37:02 PM, 25 December 2021)

Newton's second law applied to the fluid particle, is given as _____.

Select the correct option

○	$F_{particle} = m_{particle} - a_{particle}$
○	$F_{particle} = m_{particle} * a_{particle}$ ✓
○	$F_{particle} = m_{particle} / a_{particle}$
○	$F_{particle} = m_{particle} + a_{particle}$

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Question # 10 of 10 (Start time: 05:13:05 PM, 25 December 2021)

At which vertical distance, the pressure in a fluid will be minimum while assuming that the fluid is at rest?

Select the correct option

- 20m
- 9m
- 7m
- 10m

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 3 of 10 (Start time: 04:57:20 PM, 25 December 2021)

The developing flow in a circular pipe, in cylindrical coordinate system, is _____

Select the correct option

○	one-dimensional
○	zero-dimensional
○	two-dimensional ✓
○	three-dimensional

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MTH642 - Fluid Mechanics (Quiz 1)

Question # 5 of 10 (Start time: 03:56:42 PM, 25 December 2021)

The quantity of matter or the region in space chosen for study is defined as _____.

Select the correct option

○	boundary
○	system ✓
○	imaginary surface
○	surrounding

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MTH642

Mid Term(Grand Quiz) All in 1 File

Lec (1-22), Topic (1-75)

- MTH642 Quiz#1 All in 1 File2021 pg87

Objective (8 files)

Files (27june2021)

- Mth642 solved G.Quiz pg53
- MTH642 solved 27june2021 pg53
- M@l!k Mth642 grand quiz correct solution pg103
- MTH642 grand quiz correct solution by moeez pg103
- MTH642 grand quiz correct solution by moeez 27june2021 pg58
- Mth642 mega midterm quiz file(searchable by sahir) pg428
- Mth642 grand quiz pg210

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MTH642:Grand Quiz

Question # 1 of 30 (Start time: 09:00:35 AM, 27 June 2021)

Manometer is a device used to measure _____.

Select the correct option

- pressure differences
- energy differences
- volume differences
- velocity differences

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MTH642:Grand Quiz

Quiz Sta

Question # 2 of 30 (Start time: 09:01:16 AM, 27 June 2021)

The substance in liquid or gas phase is referred as

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Select the correct option

- electrolyte
- fluid
- plasma
- ions

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MTH642:Grand Quiz

Question # 3 of 30 (Start time: 09:02:06 AM, 27 June 2021)

Fully developed velocity profile V=V(r) represents _____.

Select the correct option

- ○ dimensionless flow
- ○ one dimensional flow
- ○ two dimensional flow
- ○ three dimensional flow

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MTH642:Grand Quiz

Question # 4 of 30 (Start time: 09:03:01 AM, 27 June 2021)

Surface tension comes into act due to the _____ between the molecules of the liquids.

Select the correct option

- spaces
- velocity difference
- energy difference
- attractive forces ✓

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Question # 5 of 30 (Start time: 09:04:31 AM, 27 June 2021)

Which property allows us to assume that the properties vary continually in space without any jump discontinuities?

Select the correct option

- Pressure
- Continuum
- Volume
- Density

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MTH642:Grand Quiz

Question # 6 of 30 (Start time: 09:05:46 AM, 27 June 2021)

The quantity of matter or the region in space chosen for study is defined as _____

Select the correct option

- imaginary surface
- boundary
- surrounding
- system

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MTH642:Grand Quiz

Question # 7 of 30 (Start time: 09:06:53 AM, 27 June 2021)

Which of the following is the total derivative operator?

Select the correct option

○	∂
○	Δ
●	d
○	D

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MTH642:Grand Quiz

Question # 8 of 30 (Start time: 09:07:31 AM, 27 June 2021)

Surface tension is defined as _____.

Select the correct option

○	stress per unit length
○	momentum per unit length
○	viscosity per unit length
○	force per unit length

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MTH642:Grand Quiz

Question # 9 of 30 (Start time: 09:08:36 AM, 27 June 2021)

If there is no change with location over a specified region then the flow is termed as _____.

Select the correct option

- uniform flow
- unsteady flow
- nonuniform flow
- steady flow

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MTH642:Grand Quiz

Question # 10 of 30 (Start time: 09:09:41 AM, 27 June 2021)

In which direction, the pressure will not change if the fluid is at rest?

Select the correct option

○	direction along the negative slop
○	horizontal direction
○	direction along the positive slop
○	vertical direction

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MTH642:Grand Quiz

Question # 11 of 30 (Start time: 09:11:33 AM, 27 June 2021)

The pressure of a gas or vapor in a mixture with other gases is defined as _____.

Select the correct option

○	static pressure
○	partial pressure
○	vapor pressure
○	saturation pressure

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MTH642:Grand Quiz

Question # 12 of 30 (Start time: 09:12:29 AM, 27 June 2021)

If at any point the fluid properties change with respect to time, then the flow is termed as _____.

Select the correct option

- steady flow
- unsteady flow
- nonuniform flow
- uniform flow

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MTH642:Grand Quiz

Question # 16 of 30 (Start time: 09:17:27 AM, 27 June 2021)

By Newton's second law, the net force acting on the fluid particle is given as the product of its_____ and_____.

Select the correct option

- ○ pressure, velocity
- ○ acceleration, time
- ○ mass, acceleration
- ○ velocity, time

khattak

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MTH642:Grand Quiz

Question # 15 of 30 (Start time: 09:16:06 AM, 27 June 2021)

A closed system can also be referred as _____.

Select the correct option

○	international system
○	isolated system
○	control mass
○	control volume

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MTH642:Grand Quiz

Question # 14 of 30 (Start time: 09:14:43 AM, 27 June 2021)

The flow regions in which the frictional effects are negligible are termed as _____ flow regions.

Select the correct option

- ○ viscous
- ○ external
- ○ internal
- ○ inviscid ✓

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MTH642:Grand Quiz

Question # 18 of 30 (Start time: 09:19:41 AM, 27 June 2021)

System is the contact surface shared by both boundary and surrounding.

Select the correct option

○	True
○	False



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MTH642:Grand Quiz

Question # 20 of 30 (Start time: 09:21:13 AM, 27 June 2021)

If density is defined as mass per unit volume then what will be the specific volume?

Select the correct option

○	volume + unit mass
○	volume / unit mass
○	volume × unit mass
○	volume - mass

khattak

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MTH642:Grand Quiz

Question # 21 of 30 (Start time: 09:21:57 AM, 27 June 2021)

Which of the following may **NOT** have a free surface?

Select the correct option

○	An open container filled with hydrogen gas
○	An open container filled with water
○	An open container filled with liquid mercury
○	An open container filled with oil

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MTH642:Grand Quiz

Question # 22 of 30 (Start time: 09:23:27 AM, 27 June 2021)

Which of the following is an extensive property?

Select the correct option

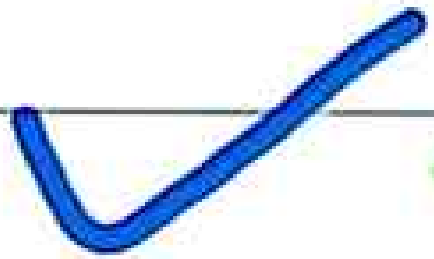
- ○ Total mass
- ○ Density
- ○ Temperature
- ○ Pressure

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Question # 23 of 30 (Start time: 09:24:11 AM, 27 June 2021)

The dimension of area is _____.

Select the correct option



○	L^2
○	L^{-1}
○	L^3
○	L^{-2}

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MTH642:Grand Quiz

Question # 24 of 30 (Start time: 09:25:11 AM, 27 June 2021)

The friction between the fluid layers causes the fluid velocity to

Select the correct option

- decrease
- increase

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MTH642:Grand Quiz

Question # 19 of 30 (Start time: 09:20:39 AM, 27 June 2021)

Newton's second law applied to the fluid particle, is given as _____.

Select the correct option

○	$F_{particle} = m_{particle} + a_{particle}$
●	$F_{particle} = m_{particle} \times a_{particle}$
○	$F_{particle} = m_{particle} - a_{particle}$
○	$F_{particle} = m_{particle} / a_{particle}$

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MTH642:Grand Quiz

Question # 25 of 30 (Start time: 09:26:41 AM, 27 June 2021)

The fluid forced to flow in a confined channel is classified as being ____.

Select the correct option

- ○ internal flow
- ○ viscous flow
- ○ natural flow
- ○ compressible flow

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MTH642:Grand Quiz

Question # 26 of 30 (Start time: 09:28:29 AM, 27 June 2021)

In which of the following, the rate of deformation is proportional to the shear stress?

Select the correct option

- ○ Bingham Plastics
- ○ Pseudoplastics
- ○ Newtonian fluids ✓
- ○ Dilatant

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MTH642:Grand Quiz

Quiz Start Time: 09:00 AM, 27 June 202

Question # 28 of 30 (Start time: 09:31:46 AM, 27 June 2021)

Total Marks:

Which of the following statements is/are true?
1: Solids can resist applied shear stress by deforming.
2: liquids cannot resist applied shear stress and continuously deform.

Select the correct option

- both 1 and 2
- 2 only
- nether 1 nor 2
- 1 only

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MTH642:Grand Quiz

Question # 29 of 30 (Start time: 09:33:11 AM, 27 June 2021)

Stress is defined as _____.

Select the correct option

- ○ work done per unit area
- ○ force per unit area
- ○ fluid flow per unit area
- ○ momentum per unit area

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MTH642:Grand Quiz

Question # 30 of 30 (Start time: 09:33:53 AM, 27 June 2021)

Viscosity is caused by _____.

Select the correct option

○	cohesive forces between the molecules in liquids
○	friction force develops between two fluid layers when they move
○	molecular collisions in gases
○	All ✓

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An open system can also be referred as _____.

Select the correct option

- ○ international system
- control mass
- ○ isolated system
- ○ control volume

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Question # 1 of 30 (Start time: 09:37:32 AM, 27 June 2021)

The advective acceleration is given by _____

Select the correct option

- ○ $\partial V / \partial t$
- ○ $(V \bullet \nabla)V$
- ○ $\nabla \bullet V$
- ○ $V \bullet \nabla$

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Question # 5 of 30 (Start time: 09:41:35 AM, 27 June 2021)

Which one of the following is **NOT** a secondary dimension?

Select the correct option

- ○ Velocity
- ○ Temperature ✓
- ○ Acceleration
- ○ Momentum

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The pressure exerted by the vapor of a pure substance in phase equilibrium with its liquid at given temperature is called _____.

Select the correct option

- vapor pressure
- atmospheric pressure
- saturation pressure
- partial pressure

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Question # 10 of 30 (Start time: 09:48:18 AM, 27 June 2021)

If a normal force of one newton is exerted by the fluid per unit area, then the pressure will be _____.

Select the correct option

- ○ 1 atm
- ○ 1 bar
- ○ 1kgf /cm^2
- ○ 1 Pa ✓

Khattak

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Question # 12 of 30 (Start time: 09:50:42 AM, 27 June 2021)

In which of the following system, the amount of mass is fixed and no mass and even energy can cross its boundary?

Select the correct option

○	Closed system
○	Open system
○	Isolated system
○	International system

khattak

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Question # 15 of 30 (Start time: 09:54:23 AM, 27 June 2021)

One-, Two- and Three-Dimensional flows are characterized by _____.

Select the correct option

○	mass distribution
○	velocity distribution
○	momentum distribution
○	energy distribution

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MTH642:Grand Quiz

Question # 15 of 30 (Start time: 09:54:23 AM, 27 June 2021)

Which of the following is **NOT** an internal flow?

Select the correct option

- ○ unbounded fluid flow over the surface of a wire ✓
- ○ hot gas flow in a duct
- ○ liquid flow between the two parallel plates
- ○ water flow in a pipe

Khattak

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Which of the following is **NOT** a drived dimension?

Select the correct option

- ○ Area
- ○ Volume
- ○ Velocity
- ○ Length

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Which of the following is called **the local acceleration?**

Select the correct option

- ○ $\partial V / \partial t$
- ○ dV / dt
- ○ $\Delta V / \Delta t$
- ○ DV / Dt

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MTH642:Grand Quiz

Question # 22 of 30 (Start time: 10 03 03 AM, 27 June 2021)

The number of significant digits in 10.660 is _____.

Select the correct option

○	2
○	4
○	3
○	5



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Question # 10 of 30 (Start time: 12:46:51 PM, 27 June 2021)

The local acceleration will be zero for

Select the correct option

- unsteady flow
- steady flow ✓

Solved by M@!K

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Question # 25 of 30 (Start time: 12:39:43 PM, 27 June 2021)

The flow of an unbounded fluid over a surfacel is classified as being _____.

Select the correct option

○	natural flow
○	external flow ✓
○	forced flow
○	internal flow

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MTH642:Grand Quiz

Question # 30 of 30 (Start time: 12:44:08 PM, 27 June 2021)

The unit of velocity is _____.

Select the correct option

- ○ ms
- ○ $m^{-1}s$
- ○ ms^{-1} 
- ○ $m^{-1}s^{-1}$

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By definition, the acceleration of the fluid particle is the time derivative of _____.

Select the correct option

○	the fluid's momentum
○	the fluid's displacement
○	the fluid's pressure
○	the fluid's velocity ✓

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MTH642:Grand Quiz

Question # 13 of 30 (Start time: 09:13:46 AM, 27 June 2021)

Viscosity is a measure of internal ____ of the fluid.

Select the correct option

- ○ stress
- ○ temperature
- ○ thickness 
- ○ momentum

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MTH642:Grand Quiz

Question # 4 of 30 (Start time: 10:21:24 AM, 27 June 2021)

The magnitude of the drag force depends on _____

Select the correct option

- ○ the momentum of the flow
- ○ the viscosity of the flow ✓
- ○ the pressure of the flow
- ○ the velocity of the flow

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MTH642:Grand Quiz

Question # 30 of 30 (Start time: 10:44:30 AM, 27 June 2021)

In a steady flow, the fluid properties _____ at any fixed point.

Select the correct option

- vary
- remain constant

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MTH642:Grand Quiz

Question # 10 of 30 (Start time: 10:48:28 AM, 27 June 202

Flow having significant frictional effects is termed as ___

Select the correct option

○	external flow
○	viscous flow ✓
○	internal flow
○	inviscid flow

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Question # 29 of 30 (Start time: 10:43:18 AM, 27 June 2021)

Total Marks: 1

In solids stress is proportional to strain but in fluids stress is proportional to strain rate.

Select the correct option

- True
- False

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MTH642:Grand Quiz

Question # 25 of 30 (Start time: 10:40:01 AM, 27 June 2021)

In what type of flow, the mass, volume and energy content of the flow section do not change?

Select the correct option

- O Steady flow
- O Uniform flow
- O Unsteady flow
- O Nonuniform flow

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MTH642:Grand Quiz

Question # 17 of 30 (Start time: 09:18.04 AM, 27 June 2021)

Which of the following statement(s) is/are true?

1. A liquid does not form a free surface.
2. Gas expands to fill the entire available space.

Select the correct option

- 2 only
- 1 only
- Neither 1 nor 2
- 1 and 2 both ✓

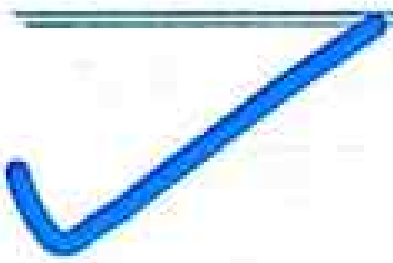
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Question # 11 of 30 (Start time: 09:49:51 AM, 27 June 2021)

Which one of the following is a primary dimension?

Select the correct option

○	Velocity
○	Volume
○	Energy
○	Time



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MTH642:Grand Quiz

Question # 27 of 30 (Start time: 09:30:10 AM, 27 June 2021)

The developing velocity profile V(r,z) represents _____.

Select the correct option

- ○ three dimensional flow
- ○ one dimensional flow
- ○ dimensionless flow
- ○ two dimensional flow ✓

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MTH642:Grand Quiz

Question # 11 of 30 (Start time: 10:26:39 AM, 27 June 2021)

Barometer is a device used to measure _____.

Select the correct option

- atmospheric pressure
- saturation pressure
- partial pressure
- vapor pressure

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Which one of the following is a secondary dimension?

Select the correct option

- ○ Mass
- ○ Length
- ○ Acceleration ✓
- ○ Temperature

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MTH642:Grand Quiz

Question # 15 of 30 (Start time: 10:29:25 AM, 27 June 2021)

The are _____ primary dimensions.

Select the correct option

- seven
- six
- five
- eight

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The Greek mathematician Archimedes applied _____ to determine the gold content of the crown of King Hiero.

Select the correct option

○	the law of conservation of mass
○	the law of conservation of momentum
○	the buoyancy principle
○	the gravity principle

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Question # 23 of 30 (Start time: 10:07:34 AM, 27 June 2021)

Newton's second law applied to the fluid particle, is given as _____.

Select the correct option

○	$F_{particle} = m_{particle} / a_{particle}$
○	$F_{particle} = m_{particle} - a_{particle}$
○	$F_{particle} = m_{particle} + a_{particle}$
○	$F_{particle} = m_{particle} \times a_{particle}$ ✓

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MTH642 Grand Quiz

Question # 11 of 30 (Start time: 10:17:10 AM, 27 June 2021)

The three terms acceleration of a fluid particle, local acceleration and advective acceleration can be related as:

Select the correct option

O	acceleration of a fluid particle = local acceleration + advective acceleration
O	acceleration of a fluid particle = local acceleration / advective acceleration
O	acceleration of a fluid particle = local acceleration - advective acceleration
O	acceleration of a fluid particle = local acceleration * advective acceleration

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MTH642:Grand Quiz

Question # 17 of 30 (Start time: 10:32:40 AM, 27 June 2021)

___ is the measure of internal thickness of the fluid.

Select the correct option

O	Momentum
O	Volume
O	Viscosity
O	Stress

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MTH642:Grand Quiz

Question # 23 of 30 (Start time: 12:53:22 PM, 27 June 2021)

Can a body weighing 150 lbf on earth will weigh only 25 lbf on the moon?

Select the correct option

○	Yes
	No

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MTH642 Grand Quiz

Question # 4 of 30 (Start time: 10:30:48 AM, 27 June 2021)

Which of the following is a Newtonian fluid?

Select the correct option

○	Liquid plastics
○	Toothpaste
○	Blood
●	Gasoline ✓

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Question # 26 of 30 (Start time: 10:08:58 AM 27 June 2021)

The pressure applied to a confined fluid increases the pressure throughout by the same amount. This law is known as _____

Select the correct option

- ○ Pascal's law
- ○ Ohm's Law
- ○ Euler's law
- ○ Newton's law

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MTH642:Grand Quiz

Question # 25 of 30 (Start time: 10:07:33 AM, 27 June 2021)

In which of the following, the rate of deformation is proportional to the shear stress?

Select the correct option

○	Dilatant
○	Pseudoplastics
○	Bingham Plastics
○	Newtonian fluids ✓

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If the fluid is at rest, then which of the following will be zero?

Select the correct option

○	stress
○	normal stress
○	pressure
○	shear stress



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Question # 27 of 30 (Start time: 10:41:23 AM, 27 June 2021)

For fluid at rest, the shear stress is

Select the correct option

- o maximum
- o zero ✓
- o undefined
- o minimum

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MTH642 Midterm Quiz Collection (Part 1/5)

➢ Viscosity is the measure of internal ____ of the liquid ?

a) Resistance M(024)
b) Stress
c) Temperature
d) Thickness ✓

- It appears that there is a property that represents the internal resistance of a fluid to motion or the "fluidity," and that property is the viscosity.

MTH642 Midterm Quiz Collection (Part 1/5)

➢ In which direction, the pressure will not change if the fluid is at rest ?

a) Horizontal direction ✓ M(031)
b) Direction along –ve slop
c) Direction along +ve slop
d) Vertical direction

- Pressure in a fluid at rest does not change in the horizontal direction.

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MTH642 Midterm Quiz Collection (Part 1/5)

➢ The flow of an unbounded fluid over a surface is classified as being _____

a) External flow ✓ M(008)
b) Internal flow
c) Uniform flow
d) Natural flow

• The flow of an unbounded fluid over a surface such as a plate, a wire, or a pipe is external flow.

MTH642 Midterm Quiz Collection (Part 1/5)

➢ Which of the following is the total derivative operator ?

a) d (d/dt) M(041)
b) D ✓
c) Δ
d) Δ

• The total derivative operator d/dt is called the material derivative; some authors also assign to it a special notation, D/Dt.

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MTH642 Midterm Quiz Collection (Part 1/5)

➢ In what type of flow, the mass, volume and energy content of the flow do not change ?

a) Steady flow ✓ M(012)
b) Unsteady flow
c) Uniform flow
d) Non-uniform flow

within a device, but at any fixed point they remain constant. Therefore, the volume, the mass, and the total energy content of a steady-flow device or flow section remain constant in steady operation.

MTH642 Midterm Quiz Collection (Part 1/5)

➢ The substance in liquid or gas phase is referred as _____

a) Fluid ✓ M(001)
b) Plasma
c) Electrolyte
d) Matter

- A substance in the liquid or gas phase is referred to as a fluid.

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MTH642 Midterm Quiz Collection (Part 1/5)

➢ ____ is the measure of internal resistance of the fluid.

a) Viscosity ✓ M(024)
b) Vapors
c) Stress
d) Momentum

- It appears that there is a property that represents the internal resistance of a fluid to motion or the "fluidity," and that property is the viscosity.

MTH642 Midterm Quiz Collection (Part 1/5)

➢ Stress is defined as _____

a) Force per unit area ✓ M(001)
b) Work done per unit area
c) Fluid flow per unit area
d) momentum per unit area

- Stress is defined as force per unit area and is determined by dividing the force by the area upon which it acts.

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MTH642 Midterm Quiz Collection (Part 1/5)

➢ which of the following is an extensive property ?

a) Total mass ✓ M(019)
b) Density
c) Temperature
d) Pressure

- Extensive properties are those whose values depend on the size—or extent—of the system.

- Intensive properties are those that are independent of the mass of a system, such as temperature, pressure, and density.

MTH642 Midterm Quiz Collection (Part 1/5)

➢ Flow having significant frictional effects is termed as ____

a) Viscous flow ✓ M(007)
b) External flow
c) Internal flow
d) Inviscid flow

- Flows in which the frictional effects are significant are called viscous flows.

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MTH642 Midterm Quiz Collection (Part 1/5)

Original

➢ If there is no change with location over a specified region then the flow is termed as ____

a) Steady flow M(011)
b) Unsteady flow
c) Uniform flow ✓
d) Non-uniform flow

- Steady implies no change at a point with time.

MTH642 Midterm Quiz Collection (Part 1/5)

➢ One, Two and Three dimensional flows are characterized by ____

a) Velocity distribution ✓ M(013)
b) Mass distribution
c) Momentum distribution
d) Energy distribution

- A flow field is best characterized by the velocity distribution, and thus a flow is said to be one-, two-, or three-dimensional if the flow velocity varies in one, two, or three primary dimensions, respectively.

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MTH642 Midterm Quiz Collection (Part 1/5)

➢ The pressure exerted by the vapor of a pure substance in phase equilibrium with its liquid at given temperature is called ____

a) Vapor pressure M(023)
b) Partial pressure
c) Saturation pressure
d) None of these

- The vapor pressure P_v of a pure substance is defined as the pressure exerted by its vapor in phase equilibrium with its liquid at a given temperature.

MTH642 Midterm Quiz Collection (Part 1/5)

➢ If at any point the fluid properties change with respect to time then the flow is referred as ____

a) Unsteady flow M(011)
b) Steady flow
c) Uniform flow
d) Non-uniform flow

- The term steady implies no change at a point with time. The opposite of steady is unsteady.

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MTH642 Midterm Quiz Collection (Part 1/5)

➢ Which one of the following is a primary dimension ____

a) Time ✓ M(017)
b) Velocity
c) Volume
d) Energy

• Some basic dimensions such as mass m, length L, time t, and temperature T are selected as primary or fundamental dimensions, while others such as velocity V, energy E, and volume V are expressed in terms of the primary dimensions and are called secondary dimensions, or

MTH642 Midterm Quiz Collection (Part 1/5)

➢ Which one of the following is NOT a secondary dimension ?

a) Temperature ✓ M(017)
b) Acceleration
c) Momentum
d) Velocity

• Some basic dimensions such as mass m, length L, time t, and temperature T are selected as primary or fundamental dimensions, while others such as velocity V, energy E, and volume V are expressed in terms of the primary dimensions and are called secondary dimensions, or derived dimensions.

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MTH642 Midterm Quiz Collection (Part 1/5)

➢ If a normal force of one newton is exerted by the fluid per unit area, then pressure will be ____

a) 1 Pa ✓ M(030)
b) 1 bar
c) 1 atm
d) 1 kgf/cm

- Since pressure is defined as force per unit area, it has the unit of newton per square meter (N/m^2), which is called a Pascal (Pa).
- That is; 1 Pa = 1 N/m^2.

MTH642 Midterm Quiz Collection (Part 1/5)

➢ The quantity of matter or the region in space chosen for study is defined as ____

a) System ✓ M(015)
b) Surrounding
c) Imaginary surface
d) Boundary

- A system is defined as a quantity of matter or a region in space chosen for study.

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MTH642 Midterm Quiz Collection (Part I/5)

➢ The advective acceleration is given by ____

a) $(V.\nabla)V$ ✓ M(053)
b) $\nabla . V$
c) $V \times \nabla$
d) None of these

identically zero for this steady flow field, the adective acceleration $(\vec{V} \cdot \vec{\Delta})\vec{V}$ is not zero. We first calculate the average x-component of velocity at

MTH642 Midterm Quiz Collection (Part I/5)

➢ Fully developed velocity profile represents_____

a) One dimensional flow ✓ M(014)
b) Two dimensional flow
c) Three dimensional flow
d) Dimensional less flow

- The fully developed flow in a circular pipe is one-dimensional

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MTH642 Midterm Quiz Collection (Part 1/5)

➢ In which of the following system, the amount of mass is fixed and non mass and even energy can cross its boundary ?

a) Isolated system M(016)
b) Open system
c) Closed system ✓

- A closed system (also known as a control mass) consists of a fixed amount of mass.
- If, as a special case, even energy is not allowed to cross the boundary, that system is called an isolated system.

MTH642 Midterm Quiz Collection (Part 1/5)

➢ The Greek mathematician Archimedes applied _ to determine gold content of the crown of King Hiero

a) The buoyancy principle ✓ M(004)
b) The law of conservation of momentum
c) The gravity principle
d) The law of conservation of mas

- Greek mathematician Archimedes (285–212 BC). He formulated and applied the buoyancy principle in history's first nondestructive test to determine the gold content of the crown of King Hiero I.

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MTH642 Midterm Quiz Collection (Part 1/5)

➢ which property allows us to assume that the properties vary continually in space with no jump discontinuities.

a) Continuum ✓ M(020)
b) Pressure
c) Volume d) Density

• The continuum idealization allows us to treat properties as point functions and to assume that the properties vary continually in space with no jump discontinuities.

MTH642 Midterm Quiz Collection (Part 1/5)

➢ Manometer is a device used to measure the ___

a) Pressure differences ✓ M(035)
b) Volume differences
c) Velocity differences
d) Energy differences

this principle is called a manometer, and it is commonly used to measure small and moderate pressure differences. A manometer mainly consists

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MTH642 Midterm Quiz Collection (Part 1/5)

➢ An open system can be referred as ____

a) Control volume ✓ M(015)
b) International system
c) Isolated system
d) Control mass

• An open system, or a control volume, as it is often called, is a properly selected region in space.

MTH642 Midterm Quiz Collection (Part 1/5)

➢ The friction between the fluid layers causes the fluid velocity to ____

a) Decreases ✓
b) Increases
c) No effect
d) Non of these

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MTH642 Midterm Quiz Collection (Part 1/5)

➢ System is the contact surface shared by both boundary and surrounding.

a) False M(015)

b) True

- A system is defined as a quantity of matter or a region in space chosen for study.

- Note that the boundary is the contact surface shared by both the system and the surroundings.

MTH642 Midterm Quiz Collection (Part 1/5)

➢ By definition, the acceleration of the fluid particle is the time derivative of ____

a) The fluid velocity M(040)

b) The fluid pressure

c) The fluid displacement

d) The fluid momentum

- The acceleration of the fluid particle is the time derivative of the particle's velocity: $\vec{a} = \frac{d\vec{v}}{dt}$

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MTH642 Midterm Quiz Collection (Part 1/5)

➢ Which of the following is NOT an internal flow ?

a) Unbounded flow over the surface of a wire M(008)
b) Water flow in a pipe
c) Liquid flow between two parallel plates
d) Hot gas flow in a duct

• The flow of an unbounded fluid over a surface such as a plate, a wire, or a pipe is external flow.

MTH642 Midterm Quiz Collection (Part 1/5)

➢ Closed system can be referred as _____

a) Control mass M(015)
b) International system
c) Isolated system
d) Control volume

• A closed system (also known as a control mass) consists of a fixed amount of mass. (Fig - 07)

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MTH642

Mid Term All in 1 File

Subjective (5 files)

- Subj Paper mth642 2021 Solved By Moin pg4
- Mth 642 mid solve paper-converted pg3
- mth 642 book quiz-converted pg8
- Mth 642 Imp Coordinates-converted pg2
- Mth642 mid paper jan 2022

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Write a linear momentum equation in newton's second law? ***3marks***

Answer:

Newton's second law:

$$F = ma$$

where F is the force acting on an object, m is the mass of the object, and a is the object's acceleration.

We can rewrite this using the definition $a \equiv \frac{\Delta v}{\Delta t}$, where Δv is the change in velocity of the object over some time duration Δt.

$$F = m\frac{\Delta v}{\Delta t}$$

which is equivalent to:

$$F = \frac{\Delta p}{\Delta t}$$

where $\Delta p \equiv m\Delta v$ is change in momentum.

Write the compressible continuity equation in cylindrical coordinates? 2marks

Answer:

Compressible

continuity equation: $\vec{\nabla}\cdot(\rho\vec{V}) = 0$

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In Cartesian coordinates, this reduces to

$$\frac{\partial(\rho u)}{\partial x}+\frac{\partial(\rho v)}{\partial y}+\frac{\partial(\rho w)}{\partial z}=0$$

In cylindrical coordinates, it reduces to

$$\frac{1}{r}\frac{\partial(r\rho u_r)}{\partial r}+\frac{1}{r}\frac{\partial(\rho u_\theta)}{\partial \theta}+\frac{\partial(\rho u_z)}{\partial z}=0$$

Example of incompressible and study fluid flow? 5marks

Answer:

Compressible

continuity equation: $\vec{\nabla}\cdot(\rho\vec{V})=0$

In Cartesian coordinates, this reduces to

$$\frac{\partial(\rho u)}{\partial x}+\frac{\partial(\rho v)}{\partial y}+\frac{\partial(\rho w)}{\partial z}=0$$

In cylindrical coordinates, it reduces to

$$\frac{1}{r}\frac{\partial(r\rho u_r)}{\partial r}+\frac{1}{r}\frac{\partial(\rho u_\theta)}{\partial \theta}+\frac{\partial(\rho u_z)}{\partial z}=0$$

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Incompressible continuity equation: $\vec{\nabla}\cdot\vec{V}=0$

Since $\partial\rho/\partial t\equiv 0$

Incompressible continuity equation in Cartesian coordinates:

$$\frac{\partial u}{\partial x}+\frac{\partial v}{\partial y}+\frac{\partial w}{\partial z}=0$$

Incompressible continuity equation in cylindrical coordinates:

$$\frac{1}{r}\frac{\partial(ru_r)}{\partial r}+\frac{1}{r}\frac{\partial(u_\theta)}{\partial\theta}+\frac{\partial(u_z)}{\partial z}=0$$

Derive Navier–Stokes equation for incompressible? ***5marks***

Answer:

Incompressible Navier–Stokes equation:

$$\rho\frac{D\vec{V}}{Dt}=-\vec{\nabla}P+\rho\vec{g}+\mu\nabla^2\vec{V}$$

Define Normalized equation? ***2marks***

Answer:

Normalized Equation:

- If the nondimensional terms in the equation are of order unity, the equation is called normalized.

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State Divergence theorem? ***2marks***

Answer:

The quickest and most straightforward way to derive the differential form of conservation of mass is to apply the divergence theorem (Gauss's theorem).

Divergence theorem: $$\int_V \vec{\nabla}\cdot\vec{G}\,dV = \oint_A \vec{G}\cdot\vec{n}\,dA$$

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Mth 642 Some Imp data From Fluid mechanics Book

Zain Awan

1–61 If mass, heat, and work are not allowed to cross the boundaries of a system, the system is called
(*a*) Isolated (*b*) Isothermal (*c*) Adiabatic (*d*) Control mass (*e*) Control volume

1–62 The speed of an aircraft is given to be 260 m/s in air. If the speed of sound at that location is 330 m/s, the flight of aircraft is
(*a*) Sonic (*b*) Subsonic (*c*) Supersonic (*d*) Hypersonic

1–63 One J/kg is equal to
(*a*) 1 kPa·m^3 (*b*) 1 kN·m/kg (*c*) 0.001 kJ
(*d*) 1 N·m (*e*) 1 m^2/s^2

1–64 Which is a unit for power?
(*a*) Btu (*b*) kWh (*c*) kcal (*d*) hph (*e*) kW

1–65 The speed of an aircraft is given to be 950 km/h. If the speed of sound at that location is 315 m/s, the Mach number is
(*a*) 0.63 (*b*) 0.84 (*c*) 1.0 (*d*) 1.07 (*e*) 1.20

1–66 The weight of a 10-kg mass at sea level is
(*a*) 9.81 N (*b*) 32.2 kgf (*c*) 98.1 N (*d*) 10 N (*e*) 100 N

1–67 The weight of a 1-lbm mass is
(*a*) 1 lbm-ft/s^2 (*b*) 9.81 lbf (*c*) 9.81 N (*d*) 32.2 lbf (*e*) 1 lbf

1–68 A hydroelectric power plant operates at its rated power of 12 MW. If the plant has produced 26 million kWh of electricity in a specified year, the number of hours the plant has operated that year is
(*a*) 2167 h (*b*) 2508 h (*c*) 3086 h (*d*) 3710 h (*e*) 8760 h

1. How is the Mach number of a flow defined? What does a Mach number of 2 indicate?

Answer:

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Ratio of the speed of flow to the speed of sound is called mach number and mach number 2 indicate flow speed that is twice the speed of flow.

2. When an airplane is flying at a constant speed relative to the ground, is it correct to say that the Mach number of this airplane is also constant?

Answer:

NO, because the speed of sound and mach number changes with temperature.

3. What is the no-slip condition? What causes it?

Answer:

A fluid in direct contact with a solid surface sticks to the surface and there is no slip is called no slip condition and its due to the viscosity of the fluid.

4. Explain why the light-year has the dimension of length?

Answer:

The light year unit is then the product of velocity and time .

5. What is the net force acting on a car cruising at a constant velocity of 70 km/h (a) on a level road and (b) on an uphill road?

Answer:

There is no acceleration , thus net force wil be zero in both cases.

6. What is the weight, in N, of an object with a mass of 150 kg at a location where g = 9.6 m/s²?

Answer:

W=mg putting values you will get 1440N

7. A 3-kW resistance heater in a water heater runs for 2 hours to raise the water temperature to the desired level. Determine the amount of electric energy used in both kWh?

Answer:

Total energy = (Energy per unit time)(Time interval)

= 3kw*2h

=6kwh

8. Consider the following steady, two-dimensional velocity field

$V = (u, v) = (0.66 + 2.1x)i + (-2.7 - 2.3y)j$. Is there a stagnation point in this flow field?

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If so, where is it?

Answer:

$$\vec{V} = (u, v) = (0.5 + 1.2x)\vec{i} + (-2.0 - 1.2y)\vec{j} \qquad (1)$$

At a stagnation point, both u and v must equal zero. At any point (x,y) in the flow field, the velocity components u and v are obtained from Eq. 1.

Velocity components: $u = 0.5 + 1.2x \qquad v = -2.0 - 1.2y \qquad (2)$

Setting these to zero yields

Stagnation point: $0 = 0.5 + 1.2x \quad x = -0.4167$; $0 = -2.0 - 1.2y \quad y = -1.667$ (3)

So, **yes there is a stagnation point**; its location is **$x = -0.417$, $y = -1.67$** (to 3 digits).

9. Consider the following steady, two-dimensional velocity field:

$$\vec{V} = (u, v) = (a^2 - (b - cx)^2)\vec{i} + (-2cby + 2c^2xy)\vec{j}$$

Is there a stagnation point in this flow field? If so, where is it?

Answer:

$$\vec{V} = (u, v) = \left(a^2 - (b - cx)^2\right)\vec{i} + (-2cby + 2c^2xy)\vec{j} \qquad (1)$$

At a stagnation point, both u and v must equal zero. At any point (x,y) in the flow field, the velocity components u and v are obtained from Eq. 1.

Velocity components: $u = a^2 - (b - cx)^2 \qquad v = -2cby + 2c^2xy \qquad (2)$

Setting these to zero and solving simultaneously yields

Stagnation point: $0 = a^2 - (b - cx)^2 \quad x = \dfrac{b - a}{c}$; $v = -2cby + 2c^2xy \quad y = 0$ (3)

So, **yes there is a stagnation point**; its location is **$x = (b - a)/c$, $y = 0$**

10. Name and briefly describe the four fundamental types of motion or deformation of fluid particles.

Answer:

- Translation – a fluid particle moves from one location to another.
- Rotation – a fluid particle rotates about an axis drawn through the particle.
- Linear strain or extensional strain – a fluid particle stretches in a direction such that a line segment in that direction is elongated at some later time.

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Mth 642 mid solve paper

1. **Define internal flow with example?**

Answer:

Internal flow is defined as a flow where in the fluid is completely confined by inner surface of an item. **For example** Flows through pipes ducts, nozzles, diffusers, valves and fittings.

2. **Difference between Viscous and inviscid flow?**

Answer:

Viscous Flow	Inviscid Flow
Flows in which the frictional effects are significant are called viscous flows.	inviscid flow is the flow of an inviscid fluid in which the viscosity of the fluid is equal to zero.
A flow where viscosity is important.	A flow where viscosity is not important

3. **If $V = x^2 + 2x - y$ then find flow is rotational or irrational?**

Answer:

As we know

$\Delta \times \vec{V} = 0$ ----------(1) (it also called curl of V)

if $\Delta \times \vec{V} = 0$ Then it will irrotational

if $\Delta \times \vec{V} \neq 0$ then it will rotational.

In order to find curl of v first we have to do

$$V = \Delta\phi$$

here we will put value of V and $\Delta\phi$

$$x^2 + 2x - y = \frac{\delta\phi}{\delta x}\vec{i} + \frac{\delta\phi}{\delta y}\vec{j} + \frac{\delta\phi}{\delta z}\vec{k}$$

$$= (2x+2)\vec{i} - \vec{j} + 0\,\vec{k}$$

Now put value in eq 1

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$$\Delta \times \vec{V} = 0$$

$$\begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ \frac{\delta}{\delta x} & \frac{\delta}{\delta y} & \frac{\delta}{\delta z} \\ 2x+2 & -1 & 0 \end{vmatrix} = \vec{i}(0-0) - \vec{j}(0-0) + (0-0)\vec{k} = 0$$

So it is irrotational Hence Proved....

Note:

If value of u and v is given then you can check irrational and incompressible by following formulas

you can use following formula

1) for finding irrotational flow

$$\omega = \frac{1}{2}\left(\frac{\delta v}{\delta x} - \frac{\delta u}{\delta y}\right) = 0$$

And

2) For finding incompress flow

$$\frac{\delta u}{\delta x} + \frac{\delta v}{\delta y} = 0$$

HELP CORNER

MTH 642 Mid Paper (10-01-2022)

1. **Define Flow Separation?**

Answer:

When a fluid is forced to flow over a curved surface, such as the back side of the cylinder at sufficiently high velocity the boundary layer can no longer remain attached to the surface and at same point it separates from the surface- a process called flow separation.

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2. Application of fluid mechanics in medicine?

Answer:

Fluid mechanics is also going through your body. For example chemotherapy and blood thinner etc

3. The rate of translation vector in Cartesian coordinates?

Answer:

$$\vec{V} = u\vec{i} + v\vec{j} + w\vec{k}$$

4. The rate of rotation vectorin Cartesian coordinates

Answer:

$$\omega = \frac{1}{2}\left(\frac{\delta w}{\delta y} - \frac{\delta v}{\delta z}\right)\vec{i} + \frac{1}{2}\left(\frac{\delta u}{\delta z} - \frac{\delta w}{\delta x}\right)\vec{j} + \frac{1}{2}\left(\frac{\delta v}{\delta x} - \frac{\delta u}{\delta y}\right)\vec{k}$$

5. Difference between solid and fluid?

Answer:

Solid	Liquid
Definite shape and volume	Volume but no definite shape
Intermolecular force Is strong	Intermolecular force is weak
Have high density	low density
Solid cannot be compressed	Liquids can be compressed

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Some define

VISCOSITY

The frictional effect between different layers of a flowing fluid is called viscosity .Viscosity measures how much force is required to slide one layer of the liquid over another layer.

DRAG FORCE

An object moving through a fluid experiences a retarding force called a drag force. The drag force increases as the speed of the object increases.

FLUID

Anything that can flow is called fluid. Liquids and gases are the examples of fluids.

LAMINAR / STREAMLINE / REGULAR FLOW

The flow is said to be streamline or laminar if every particle that passes a particular point moves along exactly the same path as followed by particles which pass that points earlier.

TURBULENT / IRREGULAR / UNSTEADY FLOW

The regular or unsteady flow of the fluid is called turbulent flow.

IDEAL FLUID

A fluid is called ideal fluid if it has following characters ,

- The fluid is non viscous I. e, there is no internal frictional force between adjacent layers of fluid.
- The fluid is incompressible I. e, its density is constant.
- The fluid motion is steady.

EQUATION OF CONTINUITY

The product of cross sectional area of the pipe and the fluid speed at any point along the pipe is a constant. This constant equals the volume flow per second of the fluid or simply flow rate.

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- Recall from physics that a substance exists in three primary phases.
- Solid, liquid and gas.
- A substance in the liquid or gas phase is referred to as a fluid.
- Distinction between a solid and a fluid is made on the basis of the substances ability to resist an applied shear (or tangential) stress that tends to change its shape.
- A solid can resist an applied shear stress by deforming, whereas a fluid deforms continuously under the influence of the shear stress no matter how small. In solids stress is proportional to strain, but in fluids stress is proportional to strain rate.
- Stress is defined as force per unit area and is determined by dividing the force by the area upon which it acts.
- The normal component of the acting on a surface per unit area is called the normal stress.
- The tangential component of force acting on a surface per unit area is called the shear stress.
- In a fluid at rest, the normal stress is called Pressure.
- A fluid at rest is at a state of zero shear stress.

$$\text{Ma} = \frac{V}{c} = \frac{\text{Speed of flow}}{\text{Speed of sound}}$$

where c is the **speed of sound** whose value is 346 m/s in air at room temperature at sea level. A flow is called sonic when Ma = 1, subsonic when Ma < 1, supersonic when Ma > 1, and hypersonic when Ma $\gg$ 1.

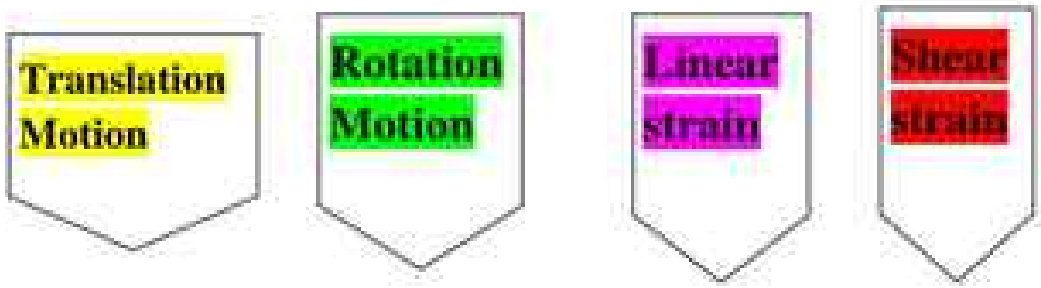
HELP CORNER

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Mth 642 Imp Coordinates

Four types of motion

Follow Color pattern to memorize easily



Cartesian coordinate of these motion

Translation motion

$$\vec{v} = u\hat{i} + v\,j + uk$$

Rotation

$$\vec{\omega} = \frac{1}{2}\left(\frac{\partial w}{\partial y} - \frac{\partial v}{\partial z}\right)\hat{i} + \frac{1}{2}\left(\frac{\partial u}{\partial z} - \frac{\partial w}{\partial x}\right)j + \frac{1}{2}\left(\frac{\partial v}{\partial x} - \frac{\partial u}{\partial y}\right)k$$

Linear Strain

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$$\epsilon_{xx} = \frac{\partial u}{\partial x}$$

$$\epsilon_{yy} = \frac{\partial v}{\partial y}$$

$$\epsilon_{zz} = \frac{\partial w}{\partial z}$$

Shear Strain

$$\epsilon_{xy} \frac{1}{2}\left(\frac{\partial u}{\partial y} - \frac{\partial v}{\partial x}\right)$$

$$\epsilon_{zx} = \frac{1}{2}\left(\frac{\partial w}{\partial x} - \frac{\partial u}{\partial z}\right)$$

$$\epsilon_{yz} = \frac{1}{2}\left(\frac{\partial v}{\partial z} - \frac{\partial w}{\partial y}\right)$$

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1. Flow seperation
2. Applications of fluid mech. in medicine
3. Basis on which fluid and solid are distinguished
4. Rate of rotation vector in cartesian coordinates.

2 questions yad nahn

Mth642 4PM (10-01-2022)

5:16 PM

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Mth642

Material derivative ka formula
Drag force
Material derivative with pressure P and Velocity D (formula and explain)

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5 sy 6 quiz mega file main sy thy. Steady flow devices wala quetion tha. System,surrounding aur boundary ko explain krna tha. Ek question linear strain rate aur shear strain rate ko define krna tha. Significant digit ko define krna tha with example. Materal derivative wala ek question tha. Baki yad ni abi.

★ 6:08 PM

[redacted]

[redacted]

5 sy 6 quiz mega file main sy thy. Steady flow devices wala quetion tha. System,surrounding aur boundary ko ex...

Mth-642 8:30am today paper.

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Objective Kafi confusing Hota. Files ka pata nahi but handouts me se hi tha objt sara but conceptual.
Subjective b full handouts se.

★ 12:47 PM

⭕Long m 1 transient flow and unsteady flow ka difference btana tha .5 marks

⭕1 rate of rotation ka question tha v given tha .5 marks

⭕Error m difference tha .3 marks

⭕ Or 1 m v given tha uss ka pta NHI kya find krna tha .3 marks

⭕ Bernolli eq. Likhna the .2 marks

★ 12:51 PM

> ⭕Long m 1 transient flow and unsteady flow ka difference btana tha .5 marks
> ⭕1 rate of rotation ka question tha v giv...

Mth642 today paper

★ 12:54 PM

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Super sonic subsonic 3 number ka ma number

★ 3:03

Water temperature wla 2 marks ka

Aik 3 dimensions wla aya velocity distribution

★ 3:04

Mth642

★ 3:04 PM

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Mth 642 today's paper 4:00pm
Mcqs ak b file main sa ni aya totally handouts sa Ur subjective main
1.internal flue with example
2.viscous nd inviscid flow difference
3.if v=x`+2x-y then flue is rotational or not?
4.ak example the hose garden wali g=0.7 etc the us main mass Ur density find krni the
5.ak Ur tha 30l buket Wala questions tha us main average velocity Ur mass find Krna tha

2:35 PM

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Bernouli equation ; adective acceleration ; do questions thay jin main aik main mass flow rate find karna tha or aik main presaure pascle main find karna tha yh dono 5 marks kay thay or aik ka formula likhna tha

★ 9:48 AM

Or aik basic vonsept wlaa tha

★ 9:48 AM

Kah jb do chezon ko phnaiko to ohlay kon si pahunchi gi apni destiny oh

★ 9:48 AM

Handsout say hi mcqs aay thay or aik file sy mcqs aya tha

★ 9:48 AM

P = p atm + pgh ko derive karna tha

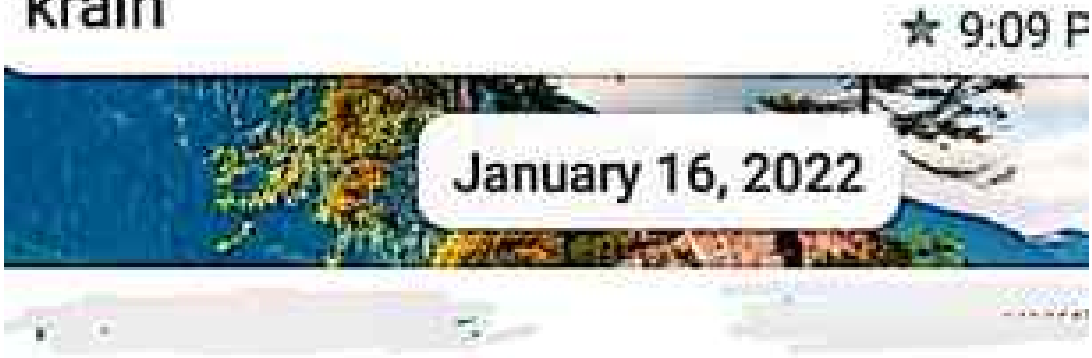
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Mth642

★ 9:48 AM

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Difference between steady and unsteady flow.
Bernoli equation di thi us me btana tha teen factors kon kon se hain
Pehka flow energy second kinetic energy and third gz wala momentum likh ata hon pta ni usko kia kehty
h1 and h2 ki values di thin or pocha tha pressure difference P1-P2 find krain



MTH 642 (15-01-2022) 7 pm
1) define steady and unsteady flow
2) define specific gravity
3) bernoli equation was given Btana tha k dP/q + V^2/2 + gz = constant kia hain ???
4)value of h1 and h2 were given difference between pressure 1 and pressure 2 btana tha
5) material derivative ki equation se related question tha
6) volume k bary tha expression b likhni thi

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