National Testing Agency

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Fluid Flow and Hydraulics

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Fluid Flow and Hydraulics

Section Id :	90958213
Section Number :	1
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Number of Questions:	100
Number of Questions to be attempted:	100
Section Marks:	100
Display Number Panel:	Yes
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Sub-Section Number:	1
Sub-Section Id:	90958213
Question Shuffling Allowed :	Yes

Question Number : 1 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A fluid is a substance that

(a) Always expands until it fills any container.

(b) Is practically incompressible.

(c) Cannot remain at rest under action of any shear force.

(d) Cannot be subjected to shear forces.

Options :

1. A
2. B
3. C
4. D

Question Number : 2 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Capillarity is due to

(a) adhesion

(b) cohesion

(c) adhesion and cohesion

(d) neither adhesion nor cohesion

Options :

1. A
2. B
3. C
4. D

Question Number : 3 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The differential equation for pressure variation in a static fluid may be written (z measured vertically upward)

(a) $dp = -wdz$

(b) $dp = -pdz$

(c) $d\rho = -wdz$

(d) $dp = -zd\rho$

Options :

1. A
2. B
3. C
4. D

Question Number : 4 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Steady flow occurs when

(a) Conditions do not change with time at any point.

(b) Conditions are the same at adjacent points at any instant.

(c) When $(\eth v / \eth s)$ is constant.

(d) Conditions change steadily with the time.

Options :

1. A
2. B
3. C
4. D

Question Number : 5 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

Uniform flow occurs

(a) Whenever the flow is steady.

(b) When $(\eth v / \eth t)$ is everywhere zero.

(c) Only when the velocity vector at any point remains constant.

(d) When $(\eth v / \eth s) = 0$.

Options :

1. A
2. B
3. C
4. D

Question Number : 6 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

Stream lines, streak lines and path lines are all identical in case of

(a) Uniform flow.

(b) Steady flow.

(c) Unsteady flow.

(d) Non uniform flow.

Options :

1. A
2. B
3. C
4. D

**Question Number : 7 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option :
No Option Orientation : Vertical**

Correct Marks : 1 Wrong Marks : 0

Euler's equations of motion can be integrated when it is assumed that

(a) The continuity equation is satisfied.

(b) The fluid is incompressible.

(c) A velocity potential exists and the density is constant.

(d) The flow is rotational and incompressible.

Options :

1. A

2. B

3. C

4. D

**Question Number : 8 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option :
No Option Orientation : Vertical**

Correct Marks : 1 Wrong Marks : 0

A source in two dimensional flow

(a) Is a point from which fluid is imagined to flow uniformaly in all directions.

(b) Is a line from which fluid is imagined to flow uniformly in all directions at right angles to it.

(c) Has streamlines that are concentric circles.

(d) None of these

Options :

1. A

2. B

3. C

4. D

**Question Number : 9 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option :
No Option Orientation : Vertical**

Correct Marks : 1 Wrong Marks : 0

The momentum correction factor is expressed by

(a) $\frac{1}{A}\int \left(\frac{v}{V}\right) dA$

(b) $\frac{1}{A}\int \left(\frac{v}{V}\right) power2dA$

(c) $\frac{1}{A}\int \left(\frac{v}{V}\right) power3dA$

(d) $\frac{1}{A}\int \left(\frac{v}{V}\right) power4dA$

Options :

1. A

2. B

3. C

4. D

Question Number : 10 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For laminar flow in pipes the momentum correction factor is

(a) Less than 1

(b) 1.03

(c) 1.33

(d) 2.0

Options :

1. A

2. B

3. C

4. D

Question Number : 11 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The head loss in turbulent flow in pipe

(a) Varies directly as the velocity.

(b) Varies inversely as the square of the velocity.

(c) Varies inversely as the square of the diameter.

(d) Varies approximately as the square of the velocity.

Options :

1. A

2. B

3. C

4. D

Question Number : 12 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The hydraulic grade line is

(a) Always above the energy grade line.

(b) The velocity head below the energy grade line.

(c) Always above the closed conduit.

(d) Always sloping downward in the direction of flow.

Options :

1. A
2. B
3. C
4. D

Question Number : 13 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In network of pipes

(a) The head loss around each elementary circuit must be zero.

(b) The head loss in all circuits is the same.

(c) The elevation of hydraulic grade line is assumed for each junction.

(d) Elementary circuits are replaced by equivalent pipes.

Options :

1. A
2. B
3. C
4. D

Question Number : 14 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The terminal velocity of a small sphere settling in a viscous fluid varies as the

(a) Inverse of the fluid viscosity.

(b) Inverse square of the diameter.

(c) Inverse of the diameter.

(d) First power of its diameter.

Options :

1. A
2. B
3. C
4. D

Question Number : 15 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The value of friction factor for smooth pipes for Reynolds number equal to 10^6 is approximately

(a) 0.0001

(b) 0.001

(c) 0.01

(d) 0.1

Options :

1. A
2. B
3. C
4. D

Question Number : 16 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Flow at critical depth occurs when

(a) The specific energy is a maximum for a given discharge.

(b) The normal depth and critical depth coincide for a channel.

(c) The velocity is given by $(2gy)^{1/2}$

(d) Any change in depth requires more specific energy.

Options :

1. A
2. B
3. C
4. D

Question Number : 17 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Conveyance of a channel section is directly proportional to

(a) Discharge.

(b) Area of cross- section.

(c) Bed-slope.

(d) Manning's coefficient.

Options :

1. A
2. B
3. C
4. D

Question Number : 18 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Hydraulic jump is used for

(a) Increasing the depth of flow.

(b) Reducing the energy of flow.

(c) Decreasing the velocity of flow.

(d) Reducing turbulence.

Options :

1. A
2. B
3. C
4. D

Question Number : 19 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An elementary wave can travel upstream in a channel with 1.0 m depth and 2 m/sec velocity, with a velocity.

(a) 5.132 m/sec

(b) 1.132 m/sec

(c) 3.132 m/sec

(d) 2.132 m/sec

Options :

1. A
2. B
3. C
4. D

Question Number : 20 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The head loss in a pipe running full is dependent on length of pipe, diameter of pipe, velocity of flow, roughness height of pipe walls, density and dynamic viscosity of the fluid. The number of dimensionless parameters that may be formed are

(a) 6

(b) 4

(c) 3

(d) 1

Options :

1. A
2. B

3. C

4. D

Question Number : 21 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Mach number is the ratio of inertia forces to

(a) Pressure forces.

(b) Elastic forces.

(c) Surface tension forces.

(d) Gravity forces.

Options :

1. A

2. B

3. C

4. D

Question Number : 22 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The lift on a body immersed in a fluid stream is

(a) Due to buoyant force.

(b) Always in the opposite direction to gravity.

(c) The resultant fluid force on the body.

(d) The dynamic fluid-force component exerted on the body normal to the approach velocity.

Options :

1. A

2. B

3. C

4. D

Question Number : 23 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The force exerted by a jet on a curved plate is

(a) Less than that on flat plate.

(b) Equal to that on flat plate.

(c) More than that on a flat plate.

(d) Sometimes more and sometimes less than that on a flat plate.

Options :

1. A
2. B
3. C
4. D

Question Number : 24 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Flow has Froude number less than one

(a) If normal depth is less than critical depth.

(b) If normal depth is more than critical depth.

(c) If normal depth is equal to critical depth.

Options :
1. A
2. B
3. C
4. D

Question Number : 25 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For laminar flow in a pipe if the centre line velocity is 0.1 m/sec, the average velocity is

(a) 5 cm/sec

(b) 10 cm/sec

(c) 15 cm/sec

(d) 20 cm/sec

Options :
1. A
2. B
3. C
4. D

Question Number : 26 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The ratio in a model of a spillway is 1:100. If the discharge in the prototype is 2000 m³/sec, the discharge in the model is

(a) 20 m³/s

(b) 2 m³/s

(c) 0.2 m³/s

(d) 0.02 m³/s

Options :

1. A
2. B
3. C
4. D

Question Number : 27 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The relation $\partial\tau/\partial y = (\partial p/\partial x)$ is valid for laminar flow between two plates when

(a) Both the plates are stationary.

(b) Both the plates are moving.

(c) One plate is moving and the other one is stationary.

(d) Any of the above cases is considered.

Options :

1. A
2. B
3. C
4. D

Question Number : 28 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The discharge scale ratio for Froude model law is

(a) $L_r^{1/2}$

(b) L_r^2

(c) $L_r^{5/2}$

(d) L_r^3

Options :

1. A
2. B
3. C
4. D

Question Number : 29 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The distance y from pipe boundary at which the point velocity is equal to the average velocity for turbulent flow is

(a) 0.223 R

(b) 0.323 R

(c) 0.423 R

(d) 0.523 R

Options :

1. A
2. B
3. C
4. D

Question Number : 30 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A ship model of scale 1: 100 has a wave resistance of 1 N at its design speed. The corresponding wave resistance in prototype will be

(a) 1 000 N

(b) 10 000 N

(c) 100 000 N

(d) 1 000 000 N

Options :

1. A
2. B
3. C
4. D

Question Number : 31 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Steady flow in an open channel exists when the

(a) Flow is uniform
(b) Channel is frictionless
(c) Depth does not change with time
(d) Channel bed is not curved

Options :

1. A
2. B
3. C
4. D

Question Number : 32 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A flood wave while passing down a river section protected by embankments, spills over the embankments at certain locations. The flow is classified as

(a) Steady GVF
(b) Unsteady GVF
(c) Steady SVF
(d) Unsteady SVF

Options :

1. A
2. B
3. C
4. D

Question Number : 33 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A uniform flow takes place in a steep channel of large slope. The hydraulic gradient line

(a) Coincides with the bed
(b) Essentially coincides with the free surface
(c) Is above the free surface
(d) Is below the free surface

Options :

1. A
2. B
3. C
4. D

Question Number : 34 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

At a channel in a channel expansion, the velocity over a quarter of the cross section is zero and is uniform over the remaining three-fourths of the area. The kinetic energy correction factor α is

(a) 1.78
(b) 1,67
(c) 1.33
(d) 2.00

Options :

1. A
2. B
3. C
4. D

Question Number : 35 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

. In an inclined channel the pressure at a depth y is calculated as wy. If this value is to be accurate within 2 per cent of the true value, the maximum inclination of the channel is

(a) 78°30′
(b) 11°29′
(c) 11°22′
(d) 8°8′

Options :

1. A
2. B
3. C
4. D

Question Number : 36 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A curvilinear flow in a vertical flow has a depth of flow of h and the pressure is found to be uniform at h throughout. The effective piezometric head measured with respect to the bed as the datum is

(a) 1/2 h
(b) 1/3 h
(c) 2/3 h
(d) 3/2 h

Options :

1. A
2. B
3. C
4. D

Question Number : 37 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A sluice gate in a small pond discharges a flow having 10.0 m² flow area and a velocity of 4.0 m/s. If the pond has a surface area of 1.0 hectare, the rate at which the water surface falls in the pond is

(a) 0.25 m/s
(b) 4 cm/s
(c) 4 mm/s
(d) 4.0 m/s

Options :

1. A
2. B
3. C
4. D

Question Number : 38 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A steep rectangular channel has a slope of 30° with the horizontal. At a section the bed is 1.20 m above the datum. The depth of flow is 0.70 m the discharge is 3.10 m³/s per meter width. The total energy head at that section by assuming α = 1.10 is

(a) 3.00m
(b) 2.91m
(c) 1.90m
(d) 3.10m

Options :

1. A
2. B
3. C
4. D

Question Number : 39 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The total energy head for an open channel flow is written with usual notation as H = z + y + v²/2g. In this, each of the terms represent

(a) Energy in kg m/kg mass of fluid
(b) Energy in N m/N of fluid
(c) Power in kW/kg mass of fluid
(d) Energy in N m/ mass of fluid

Options :

1. A
2. B
3. C
4. D

Question Number : 40 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The difference between total head line and piezometric head line represents

(a) The velocity head
(b) The pressure head
(c) The elevation of the bed of the channel
(d) The depth of flow

Options :

1. A
2. B
3. C
4. D

Question Number : 41 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

One litre of water occupies a volume of

    (a) 100 cm³

    (b) 250 cm³

    (c) 500 cm³

    (d) 1000 cm³

Options :

1. A

2. B

3. C

4. D

Question Number : 42 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In one dimensional flow ,the flow

    (a) is steady and uniform

    (b) takes place in straight line

    (c) takes place in curve

    (d) takes place in one direction

Options :

1. A

2. B

3. C

4. D

Question Number : 43 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The diameter of nozzle(d) for maximum transmission of power is given by

    (Where D=Diameter of pipe, f=Darcy's coefficient of friction for pipe, l=length of pipe)

    (a) $d=(D^5/8fl)^{1/2}$

    (b) $=(D^5/8fl)^{1/3}$

    (c) $=(D^5/8fl)^{1/4}$

    (d) $=(D^5/8fl)^{1/5}$

Options :

1. A

2. B

3. C

4. D

Question Number : 44 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Coefficient of contraction is the ratio of

    (a) actual velocity of jet at vena-contracta to the theoretical velocity

    (b) area of jet at venacontracta to the area of orifice

    (c) loss of head in the orifice to the head of water available at the exit of the orifice

    (d) actual discharge through an orifice to the theoretical discharge

Options :

1. A

2. B

3. C

4. D

Question Number : 45 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The loss of head due to friction in a pipe of uniform diameter in which a viscous flow is taking place

is (where R_N =Reynold number)

    (a) $1/R_N$

    (b) $4/R_N$

    (c) $16/R_N$

    (d) $64/R_N$

Options :

1. A

2. B

3. C

4. D

Question Number : 46 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The total energy line lies over the hydraulic gradient line by an amount equal to the

    (a) pressure head

    (b) velocity head

    (c) pressure head + velocity head

    (d) pressure head – velocity head

Options :

1. A

2. B

3. C

4. D

Question Number : 47 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A flow in which --------------- force is dominating over the viscosity is called turbulent flow.
  (a) Elastic
  (b) surface tension
  (c) Viscous
  (d) Interia

Options :

1. A

2. B

3. C

4. D

Question Number : 48 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The unit of dynamic viscosity in S.I. units is
  (a) N-m/s²
  (b) N-s/m²
  (c) Poise
  (d) Stoke

Options :

1. A

2. B

3. C

4. D

Question Number : 49 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following statement is wrong?
  (a)   A flow whose streamline is represented by a curve, is called two dimensional flow.
  (b) The total energy of a liquid partical is the sum of potential energy, kinetic energy and
       pressure energy.
  (c) The length of divergent portion in a venturimeter is equal to the convergent portion.
  (d) A pitot tube is used to measure the velocity of flow at the required point in a pipe.

Options :

1. A

2. B

3. C

4. D

Question Number : 50 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The discharge over a triangular notch is

    (a) inversely proportional to $H^{3/2}$

    (b) directly proportional to $H^{3/2}$

    (c) inversely proportional to $H^{5/2}$

    (d) directly proportional to $H^{5/2}$

Options :

1. A

2. B

3. C

4. D

Question Number : 51 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The loss of pressure head in case of laminar flow is proportional to

    (a) Velocity

    (b) (Velocity)^2

    (c) (Velocity)^3

    (d) (Velocity)4

Options :

1. A

2. B

3. C

4. D

Question Number : 52 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The equation $\sum F_x = \rho Q (\Delta V_x)$ requires the following assumptions for its derivation

    (a) The flow is steady and uniform.

    (b) The flow is steady and the velocity of flow is constant over the end cross- sections.

    (c) The flow is uniform and fluid is frictionless.

    (d) The fluid is frictionless and the velocity of flow is constant over the end cross-sections.

Options :

1. A

2. B

3. C

4. D

Question Number : 53 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following equation is not dimensionally homogenous?

Consider standard symbols for quantities.

(a) Force = m x a
(b) Head Loss due to friction, h_f = (fLV²)/(2gd)
(c) (Torque) T = F X Distance
(d) None of the above

Options :

1. A
2. B
3. C
4. D

Question Number : 54 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the effect of change in Reynold's number on friction factor in turbulent flow?

(a) As the Reynold's number increases the friction factor increases in turbulent flow
(b) As the Reynold's number increases the friction factor decreases in turbulent flow
(c) Change in Reynold's number does not affect the friction factor in turbulent flow
(d) Unpredictable

Options :

1. A
2. B
3. C
4. D

Question Number : 55 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Friction factor for laminar flow is given by

(a) (Re / 64)
(b) (64 / Re)
(c) (Re / 16)
(d) (16 / Re)

Options :

1. A
2. B
3. C
4. D

Question Number : 56 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Magnitude of eddy viscosity for laminar flow is

    (a) Less than zero

    (b) Zero

    (c) Greater than zero

    (d) Unpredictable

Options :

1. A

2. B

3. C

4. D

Question Number : 57 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The component of acceleration due to change in the direction of velocity vector is called as

    (a) Direction acceleration

    (b) Tangential acceleration

    (c) Normal acceleration

    (d) Cannot say

Options :

1. A

2. B

3. C

4. D

Question Number : 58 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In Couette flow for the condition of zero discharge the value of dimensionless pressure gradient $P =[B^2/2\mu V \,(\partial p/\partial x)]$ is

    (a) -1

    (b) -3

    (c) 1

    (d) 3

Options :

1. A

2. B

3. C

4. D

Question Number : 59 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If stream function (ψ) satisfies the Laplace equation, it is a possible case of

(a) A circular flow

(b) A rotational flow

(c) An irrotational flow

(d) None of the above

Options :

1. A

2. B

3. C

4. D

Question Number : 60 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the correct formula for loss at the exit of a pipe?

(a) $H_L = 0.5(V^2/2g)$

(b) $H_L = (V^2/2g)$

(c) $H_L = (2V^2/g)$

(d) $H_L = (4V^2/g)$

Options :

1. A

2. B

3. C

4. D

Question Number : 61 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Minor losses occur due to

(a) sudden enlargement in pipe

(b) sudden contraction in pipe

(c) bends in pipe

(d) all of the above

Options :

1. A

2. B

3. C

4. D

Question Number : 62 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The head loss through fluid flowing pipe due to friction is

    (a) the minor loss

    (b) the major loss

    (c) both a and b

    (d) none of the above

Options :

1. A

2. B

3. C

4. D

Question Number : 63 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Coefficient of friction for laminar flow is given as

    (a) (Re/32)

    (b) (32/Re)

    (c) (Re/16)

    (d) (16/Re)

Options :

1. A

2. B

3. C

4. D

Question Number : 64 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The flow of fluid will be laminar when

    (a) Reynolds no is less than 2000

    (b) Density of fluid is low

    (c) both a and b

    (d) none of the above

Options :

1. A

2. B

3. C

4. D

Question Number : 65 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

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

    (a) Reynold's equation of motion
    (b) Navier-Stoke's equation of motion
    (c) Euler's equation of motion
    (d) none of the above
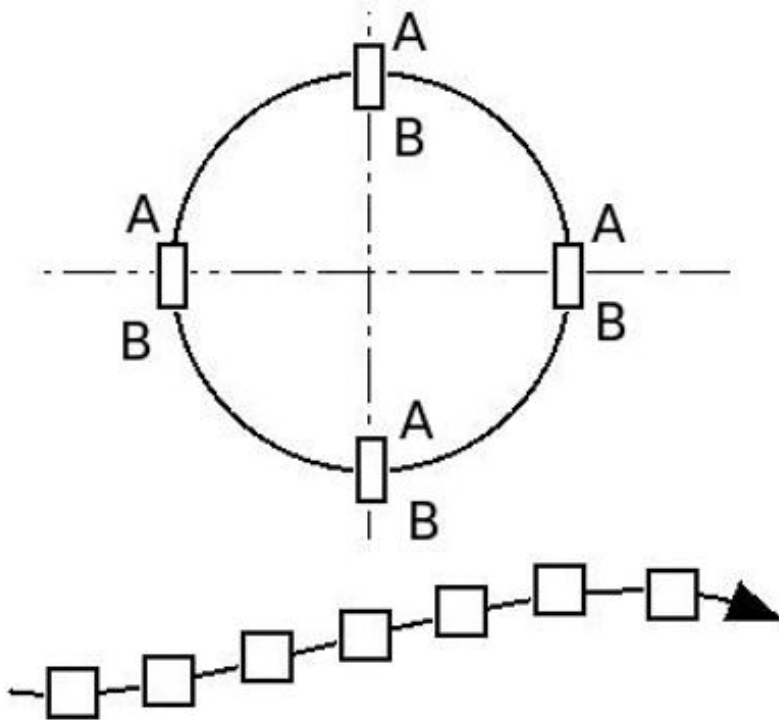
Options :

1. A
2. B
3. C
4. D

Question Number : 66 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which type of fluid flow is shown in below diagram?

    (a) Circular flow
    (b) Rotational flow
    (c) Irrotational flow
    (d) None of the above

Options :

1. A
2. B
3. C
4. D

Question Number : 67 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The actual path followed by a fluid particle as it moves during a period of time, is called as

   (a) path line

   (b) streak line

   (c) filament line

   (d) stream line

Options :

1. A

2. B

3. C

4. D

Question Number : 68 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In which method of describing fluid motion, the observer remains stationary and observes changes in the fluid parameters at a particular point only?

   (a) Lagrangian method

   (b) Eulerian method

   (c) Stationary method

   (d) All of the above

Options :

1. A

2. B

3. C

4. D

Question Number : 69 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The specific weight of the fluid depends upon

   (a) gravitational acceleration

   (b) mass density of the fluid

   (c) both a. and b.

   (d) none of the above

Options :

1. A

2. B

3. C

4. D

Question Number : 70 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If in an alluvial channel the Manning's n corresponding to a plane bed without sediment is 0.016,the same channel with dunes on the bed will have a Manning's coefficient n_d such that

    (a) $n_d < 0.016$

    (b) $n_d = 0.016$

    (c) $n_d > 0.016$

    (d) $n_d = 0.016$

Options :

1. A

2. B

3. C

4. D

Question Number : 71 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In regime alluvial channel designed by Lacey's theory

    (a) The bed load is zero

    (b) Suspended load is zero

    (c) The bed will have dune type of bed form

    (d) The bed form will be of plane bed with sediment motion

Options :

1. A

2. B

3. C

4. D

Question Number : 72 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A regime channel has a discharge of 100 m³/s. it will have perimeter of

    (a) 4.8 m

    (b) 10.0 m

    (c) 47.5 m

    (d) 22.0 m

Options :

1. A

2. B

3. C

4. D

Question Number : 73 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The mean velocity in a Lacey regime channel is proportional to

(a) $R^{1/3}$

(b) $R^{1/2}$

(c) $S_0^{1/2}$

(d) $S_0^{1/3}$

Options :

1. A

2. B

3. C

4. D

Question Number : 74 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A 2.0-m wide rectangular channel has normal depth of 1.25 m when the discharge is 8.75 m3/s. The slope of the channel is classified as

(a) Steep

(b) Mild

(c) Critical

(d) essentially horizontal

Options :

1. A

2. B

3. C

4. D

Question Number : 75 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The following types of GVF profiles do not exist:

(a) $C2, H2, A1$

(b) $A2, H1, C2$

(c) $H1, A1, C2$

(d) $C1, A1, H1$

Options :

1. A

2. B

3. C

4. D

Question Number : 76 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Identify the *incorrect* statement:

The possible GVF profiles in

(a) mild slope channels are *M*1, *M*2 and *M*3

(b) adverse slope channels are *A*2 and *A*3

(c) horizontal channels are *H*1 and *H*3

(d) critical slope channels are *C*1 and *C*3

Options :

1. A

2. B

3. C

4. D

Question Number : 77 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The total number of possible types of GVF profiles are

(a) 9

(b) 11

(c) 12

(d) 15

Options :

1. A

2. B

3. C

4. D

Question Number : 78 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

dy/dx is negative in the following GVF profi les:

(a) *M*2, *S*2, *A*2

(b) *M*2, *A*2, *S*3

(c) *A*3, *A*2, *M*2

(d) *M*2, *A*2, *H*2, *A*2

Options :

1. A

2. B

3. C

4. D

Question Number : 79 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If in a GVF dy/dx is positive, then dE/dx is:

   (a) always positive

   (b) negative for an adverse slope

   (c) negative if $y > y_c$

   (d) positive if $y > y_c$

Options :

1. A

2. B

3. C

4. D

Question Number : 80 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A long prismatic channel ends in an abrupt drop. If the flow in the channel far upstream of the drop is subcritical, the resulting GVF profile

   (a) starts from the critical depth at the drop and joins the normal depth asymptotically

   (b) lies wholly below the critical depth line

   (c) lies wholly above the normal depth line

   (d) lies partly below and partly above the critical depth line

Options :

1. A

2. B

3. C

4. D

Question Number : 81 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

When there is a break in grade due to a mild slope A changing into a milder slope B, the GVF profile produced is

   (a) $M3$ curve on B

   (b) $M2$ curve on B

   (c) $M1$ curve on B

   (d) $M1$ curve on A

Options :

1. A

2. B

3. C

4. D

Question Number : 82 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A rectangular channel has uniform flow at a normal depth of 0.50 m. The discharge intensity in the channel is estimated as 1.40 m3/s/m. If an abrupt drop is provided at the downstream end of this channel, it will cause

    (a) *M*2 type of GVF profile

    (b) *S*2 type of GVF profile

    (c) No GVF profile upstream of the drop

    (d) *M*1 type of profile

Options :

1. A

2. B

3. C

4. D

Question Number : 83 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A mild channel connecting two reservoirs is called a *short channel* if

    (a) the discharge varies with the downstream-pool elevation

    (b) the channel is on a steep slope

    (c) the channel is frictionless

    (d) some *M2* curves extend all the way up to the reservoir

Options :

1. A

2. B

3. C

4. D

Question Number : 84 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For an uncontrolled canal inlet at a reservoir, the discharge drawn

    (a) is fixed by the critical depth that occurs at the inlet

    (b) is determined by a control on the downstream end

    (c) depends on whether the channel is steep or otherwise

    (d) is a constant

Options :

1. A

2. B

3. C

4. D

Question Number : 85 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a simple island-type divided channel of rectangular cross-section, the discharge division

    (a) is judged by common sense

    (b) is inversely proportional to Manning's *n*

    (c) is to be found by iterative GVF calculations

    (d) has no fixed value

Options :

1. A

2. B

3. C

4. D

**Question Number : 86 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option :
No Option Orientation : Vertical**

Correct Marks : 1 Wrong Marks : 0

The standard Runge-Kutta method for solving GVF profiles is

    (a) an iterative procedure

    (b) not rapidly converging

    (c) dependent on the nature of the profile

    (d) independent of the direction of computation

Options :

1. A

2. B

3. C

4. D

**Question Number : 87 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option :
No Option Orientation : Vertical**

Correct Marks : 1 Wrong Marks : 0

In a rectangular channel, the alternate depths are 1.0 m and 2.0 m respectively. The specific energy
head in m is

    (a) 3.38

    (b) 1.33

    (c) 2.33

    (d) 3.0

Options :

1. A

2. B

3. C

4. D

**Question Number : 88 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option :
No Option Orientation : Vertical**

Correct Marks : 1 Wrong Marks : 0

In defining a Froude number applicable to open channels of any shape, the length parameter used is the

    (a) Ratio of area to top width
    (b) Ratio of area to wetted perimeter
    (c) Depth of flow
    (d) Square root of the area

Options :

1. A

2. B

3. C

4. D

Question Number : 89 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A triangular channel of apex angle of 120° carries a discharge of 1573 l/s. The critical depth in m is

    (a) 0.600
    (b) 0.700
    (c) 0.800
    (d) 0.632

Options :

1. A

2. B

3. C

4. D

Question Number : 90 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

At critical depth

    (a) The discharge is minimum for a given specific energy
    (b) The discharge is maximum for a given specific force
    (c) The discharge is maximum for a given specific energy
    (d) The discharge is minimum for a given specific force

Options :

1. A

2. B

3. C

4. D

Question Number : 91 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a triangular channel, the value of E_c/y_c is

    (a) 1.25

    (b) 2.5

    (c) 3.33

    (d) 1.5

Options :

1. A

2. B

3. C

4. D

Question Number : 92 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The Froude number of a flow in a rectangular channel is 0.73. If the depth of flow is 1.50 m, the specific energy in meters is

    (a) 1.90

    (b) 1.50

    (c) 1.73

    (d) 0.73

Options :

1. A

2. B

3. C

4. D

Question Number : 93 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For a triangular channel, the first hydraulic exponent M is

    (a) 2.0

    (b) 3.0

    (c) 5.0

    (d) 5.33

Options :

1. A

2. B

3. C

4. D

Question Number : 94 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a triangular channel with 1 horizontal: 1 vertical, side slope the depth of flow is 0.60 m and the discharge is 1010 liters/s. What is the specific energy?

    (a) 1.00

    (b) 0.44

    (c) 1.40

    (d) 0.60

Options :

1. A

2. B

3. C

4. D

Question Number : 95 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For a trapezoidal canal section with side slope of m horizontal : 1 vertical the value of the first hydraulic exponent M is

    (a) A constant at all stages

    (b) A function of S_0 and Manning's coefficient n

    (c) A function my/B

    (d) A function of y/B only

Options :

1. A

2. B

3. C

4. D

Question Number : 96 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For an exponential channel ($A = ky^a$) the first hydraulic exponent M is

    (a) $(a+1)$

    (b) $(2a)$

    (c) $(2a+1)$

    (d) A^2

Options :

1. A

2. B

3. C

4. D

Question Number : 97 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A bottom rack in a channel is used to withdraw a part of the discharge flowing in a canal. If the flow is subcritical throughout, this will cause

    (a) A rise in the water surface in the rack

    (b) A drop in the water surface over the rack

    (c) A jump over the rack

    (d) A lowering of the water surface upstream of the rack

Options :

1. A

2. B

3. C

4. D

Question Number : 98 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Velocity at a point in a pipe flow may be measured by installing

    (a) A pitot probe at a point

    (b) A wall tap

    (c) A stagnation pressure probe at that point

    (d) A Prandtl probe at that point

Options :

1. A

2. B

3. C

4. D

Question Number : 99 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A horizontal pipe line conveys a constant rate of flow which is measured by a venturimeter installed in it. When the pipe is inclined upward in the direction of flow the reading of level difference on a differential manometer.

    (a) Will remain same

    (b) Will increase

    (c) Will decrease

    (d) May fluctuate with time

Options :

1. A

2. B

3. C

4. D

Question Number : 100 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Schlieren flow visualization technique operates by employing
(a) Density variations in flow
(b) Density gradients in flow
(c) Second derivatives of density
(d) Higher derivatives of density.

Options :
1. A
2. B
3. C
4. D