BRAINWARE UNIVERSITY

Term End Examination 2020 - 21

Programme – Diploma in Civil Engineering

Course Name – Hydraulics

Course Code - DCE305

Semester / Year - Semester III

Time allotted : 75 Minutes Full Marks : 60

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 60=60

1. *(Answer any Sixty)*

(i) Fluid is a substance which offers no resistance to change of

a) pressure b) flow

c) shape d) volume

(ii) Practical fluids

a) are viscous b) possess surface tension

c) are compressible d) possess all these properties

(iii) A fluid is said to be ideal, if it is

a) incompressible b) inviscous

c) viscous and incompressible d) inviscous and incompressible

(iv) If no resistance is encountered by displacement, such a substance is known as

a) fluid b) water

c) gas d) ideal fluid

(v) Which of the properties are true about Liquids?

a) cannot be compressed b) occupy definite volume

c) are not affected by change in pressure d) none of these

and temperature

(vi) The value of mass density in kgsecVm4 for water at 0°C is

a) 1 b) 1000

c) 100 d) 101.9

(vii) Specific weight of water in S.I. units is equal to

a) 1000 N/m3 b) 10000 N/m3

c) 9.81 x10^3 N/m3 d) 9.81 x10^6 N/m3

(viii) When the flow parameters at any given instant remain same at every point, then flow is said to be

a) quasi static b) steady state

c) laminar d) uniform

(ix) Which of the following is demensionless

a) specific weight b) specific volume

c) specific speed d) specific gravity

(x) The normal stress in a fluid will be constant in all directions at a point only if

a) it is incompressible b) it has uniform viscosity

c) it is frictionless d) it is at rest

(xi) The pressure at a point in a fluid will not be same in all the directions when the fluid is

a) moving b) viscous

c) viscous and static d) viscous and moving

(xii) An object having 10 kg mass weighs 9.81kg on a spring balance. The value of 'g' at this place is

a) 10m/sec2
b) 9.81 m/sec2
c) 10.2/m sec
d) 9.75 m/sec2

(xiii) The tendency of a liquid surface to contract is due to the following property

a) cohesion
b) adhesion
c) viscosity
d) surface tension

(xiv) A perfect gas

a) has constant viscosity
b) has zero viscosity
c) is in compressible
d) none of these.

(xv) A fluid in equilibrium can't sustain

a) tensile stress
b) compressive stress
c) shear stress
d) bending stress

(xvi) The bulk modulus of elasticity with increase in pressure

a) increases
b) decreases
c) remains constant
d) increases first up to certain limit and then decreases

(xvii) The bulk modulus of elasticity

a) has the dimensions of 1/pressure
b) increases with pressure
c) is large when fluid is more compressible
d) is independent of pressure and viscosity

(xviii) A balloon lifting in air follows the following principle

a) law of gravitation
b) Archimedes principle
c) principle of buoyancy
d) all of these

(xix) The increase of temperature results in

a) increase in viscosity of gas
b) increase in viscosity of liquid

c) decrease in viscosity of gas

d) decrease in viscosity of liquid

(xx) Surface tension

a) acts in the plane of the interface normal to any line in the surface

b) is also known as capillarity

c) is a function of the curvature of the interface

d) decreases with fall in temperature

(xxi) A liquid compressed in cylinder has a volume of 0.04 m3 at 50 kg/cm2 and a volume of 0.039 m3 at 150 kg/cm2. The bulk modulus of elasticity of liquid is

a) 400 kg/cm2

b) 4000 kg/cm2

c) 40 x 105 kg/cm2

d) 40 x 106 kg/cm2

(xxii) The units of viscosity are

a) metre square per sec

b) kg sec/metre

c) newton-sec per metre2

d) newton-sec per meter

(xxiii) Kinematic viscosity is dependent upon

a) pressure

b) distance

c) flow

d) density.

(xxiv) Which of the following meters is not associated with viscosity

a) Red wood

b) Say bolt

c) Engler

d) Orsat

(xxv) The flow in which conditions do not change with time at any point, is known as

a) one dimensional flow

b) uniform flow

c) steady flow

d) turbulent flow

(xxvi) Choose the wrong statement

a) fluids are capable of flowing

b) fluids conform to the shape of the containing vessels

c) when in equilibrium, fluids cannot sustain tangential forces

d) when in equilibrium, fluids can sustain shear forces

(xxvii) If w is the specific weight of liquid and k the depth of any point from the surface, then pressure intensity at that point will be

a) h

b) wh

c) w/h

d) h/w

(xxviii) The units of kinematic viscosity are

a) metres2 per sec

b) kg sec/metre

c) newton-sec per metre

d) newton-sec per metre

(xxix) The ratio of absolute viscosity to mass density is known as

a) specific viscosity

b) viscosity index

c) kinematic viscosity

d) coefficient of viscosity

(xxx) Which of the following is the unit of kinematic viscosity

a) pascal

b) poise

c) stoke

d) faraday

(xxxi) A one dimensional flow is one which

a) is uniform flow

b) is steady uniform flow

c) takes place in straight lines

d) involves zero transverse component of flow

(xxxii) Specific weight of sea water is more that of pure water because it contains

a) dissolved air

b) dissolved salt

c) suspended matter
d) all of these

(xxxiii) Free surface of a liquid tends to contract to the smallest possible area due to force of

a) surface tension
b) viscosity
c) friction
d) cohesion

(xxxiv) Falling drops of water become spheres due to the property o

a) adhesion
b) cohesion
c) surface tension
d) viscosity

(xxxv) The total pressure on the surface of a vertical sluice gate 2 m x 1 m with its top 2 m surface being 0.5 m below the water level will be

a) 500 kg
b) 1000 kg
c) 1500 kg
d) 2000 kg

(xxxvi) The angle of contact in case of a liquid depends upon

a) the nature of the liquid and the solid
b) the material which exists above the free surface of the liquid
c) both of these
d) any one of the above

(xxxvii) Rain drops are spherical because of

a) viscosity
b) air resistance
c) surface tension forces
d) atmospheric pressure

(xxxviii) The capillary rise at 20°C in a clean glass tube of 1 mm bore containing water is approximately

a) 1 mm
b) 10 mm
c) 20 mm
d) 30 mm.

(xxxix) If the surface of liquid is convex, men

a) cohesion pressure is negligible
b) cohesion pressure is decreased
c) cohesion pressure is increased
d) there is no cohesion pressure

(xl) The property by virtue of which a liquid opposes relative motion between its different layers is called

a) surface tension
b) co-efficient of viscosity
c) viscosity
d) osmosis

(xli) The units of dynamic or absolute viscosity are

a) metres2 per sec
b) kg sec/meter
c) newton-sec per meter
d) newton-sec2 per meter

(xlii) The rise or depression of liquid in a tube due to surface tension with increase in size of tube will

a) increase
b) remain unaffected
c) may increase or decrease depending on the characteristics of liquid
d) decrease

(xliii) The atmospheric pressure with rise in altitude decreases

a) linearly
b) first slowly and then steeply
c) first steeply and then gradually
d) unpredictable

(xliv) Gradually varied flow is

a) steady uniform
b) non-steady non-uniform
c) non-steady uniform
d) steady non-uniform

(xlv) Steady flow occurs when

a) the direction and magnitude of the velocity at all points are identical
b) the velocity of successive fluid particles, at any point, is the same at successive periods of time
c) the magnitude and direction of the velocity do not change from point to point
d) the fluid particles move in plane or parallel planes and the streamline pat-terns

in the fluid

are identical in each plane

(xlvi) Barometer is used to measure

a) pressure in pipes, channels etc.

b) atmospheric pressure

c) very low pressure

d) difference of pressure between two points

(xlvii) Non uniform flow occurs when

a) the direction and magnitude of the velocity at all points are identical

b) the magnitude and direction of the velocity do not change from point to point in the fluid

c) the fluid particles move in plane or parallel planes and the streamline patterns are identical in each plane

d) velocity, depth, pressure, etc. change from point to point in the fluid flow

(xlviii) The speed of sound in an ideal gas varies directly as its

a) pressure

b) temperature

c) density

d) absolute temperature

(xlix) Euler's dimensionless number relates the following

a) inertial force and gravity

b) viscous force and inertial force

c) viscous force and buoyancy force

d) pressure force and inertial force

(l) Which of the following manometer has highest sensitivity

a) U-tube with water

b) inclined U-tube

c) U-tube with mercury

d) micro-manometer with water

(li) In the case of steady flow of a fluid, the acceleration of any fluid particle is

a) constant

b) variable

c) zero

d) zero under limiting conditions

(lii) The resultant upward pressure of the fluid on an immersed body due to its tendency to uplift the sub-merged body is called

a) upthrust
b) reaction
c) buoyancy
d) metacentre

(liii) The line of action of the buoyant force acts through the

a) centroid of the volume of fluid vertically above the body
b) centre of the volume of floating body
c) center of gravity of any submerged body
d) centroid of the displaced volume of fluid

(liv) The depth of the center of pressure on a vertical rectangular gate 8 m wide and 6 m high, when the water surface coincides with the top of the gate, is

a) 2.4 m
b) 3.0 m
c) 4.0 m
d) 2.5 m

(lv) According to the principle of buoyancy a body totally or partially immersed in a fluid will be lifted up by a force equal to

a) the weight of the body
b) more than the weight of the body
c) less than the weight of the body
d) weight of the fluid displaced by the body

(lvi) The normal stress is same in all directions at a point in a fluid

a) only when the fluid is frictionless
b) only when the fluid is incompressible and has zero viscosity
c) when there is no motion of one fluid layer relative to an adjacent layer
d) irrespective of the motion of one fluid layer relative to an adjacent layer

(lvii) Ratio of inertia force to elastic force is known as

a) Mach number
b) Froude number
c) Reynold's number
d) Weber's number

(lviii) The line of action of the buoyant force acts through the centroid of the

a) submerged body
b) volume of the floating body

c) volume of the fluid vertically above the body

d) displaced volume of the fluid

(lix) Resultant pressure of the liquid in the case of an immersed body acts through

a) centre of gravity

b) centre of pressure

c) metacenter

d) centre of buoyancy

(lx) The centre of gravity of the volume of the liquid displaced by an immersed body is called

a) centre of gravity

b) centre of pressure

c) metacentre

d) centre of buoyancy