BRAINWARE UNIVERSITY
Term End Examination 2020 - 21
Programme – Diploma in Mechanical Engineering
Course Name – Physics I
Course Code - DME102
Semester / Year - Semester I

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)

$[ML^{-1}T^{-2}]$ is the dimensional formula of

   a) Force
   b) coefficient of friction
   c) modulus of elasticity
   d) energy

(ii) Which of the following pairs has the same dimensions?

   a) Specific Heat and Latent Heat
   b) Impulse and Momentum
   c) Surface Tension and Force
   d) Moment of Inertia and Torque

(iii) One nanometre is equal to

   a)
   b)

   10^{-6} m
   10^{-3} m
   c)
   d)

   10^{-9} m
   10^{-10} m

(iv) Which unit of physical quantity remains same for all unit systems?

   a) Meter
   b) Second
   c) Ampere
   d) Kilogram

(v) The number of significant figures in 0.06900 is

a) 5   b) 4

c) 2   d) 3

(vi) Which of the following is derived quantity?

a) Mass   b) Luminous intensity

c) Surface tension   d) Thermodynamic temperature

(vii) The dimensions of Kinetic energy is same as that of

a) Force   b) Pressure

c) Work   d) Momentum

(viii) Chronometer measures

a) Area   b) Times

c) Length   d) Temperature

(ix) Up to proportional limit, stress strain graph is

a) curved   b) straight line

c) parabola   d) ellipse

(x) Dimensional formula of stress is same as that of

a) pressure   b) impulse

c) strain   d) force

(xi) Rain drops are spherical in shape because of

a) Surface tension   b) Capillary

c) Acceleration due to gravity   d) Downward motion

(xii) The rise of a liquid in a capillary tube does not depend upon

a) Angle of contact   b) Density of the liquid

c) Radius of the capillary tube   d) Atmospheric pressure

(xiii) The surface of water in contact with glass wall is

a) Plane   b) concave

c) convex   d) Both 'b' and 'c'

(xiv) According to Archimedes's principle, if a body is immersed partially or fully in a fluid then the buoyancy force is _____ the weight of fluid displaced by the body

a) equal to   b) less than

c) more than   d) unpredictable

(xv) Bulk modulus is the ratio of

a) shear stress to volumetric strain   b) volumetric strain to shear stress

c) compressive stress to volumetric strain   d) volumetric strain to compressive stress

(xvi) If the Reynolds number is less than 2000, the flow in a pipe is

a) Turbulent   b) Laminar

c) Transition   d) None of the above

(xvii) The unit of pressure one bar is

a) 1 Pascal   b) 1 kilo Pascal

c) 100 k Pascal   d) 1000 k Pascal

(xviii) Centre of buoyancy always

a) coincides with the centre of gravity   b) coincides with the centroid of the volume of fluid displaced

c) remains above the centre of gravity   d) remains below the centre of gravity

(xix) Equation of continuity is based on the principle of conservation of

a) mass   b) energy

c) momentum   d) none of these

(xx) if a is coefficient of Linear expansion, b coefficient of areal expansion, c coefficient of Volume expansion. Which of the following is true
    a) b=a   b) c=3a
    c) b=5a   d) a=2b

(xxi) Two wires have the same material and length, but their masses are in the ration of 4:3. If they are stretched by the same force, their elongations will be in the ratio of
    a) 1:2   b) 5:6
    c) 3:4   d) 4:3

(xxii) Which one of the following does not affect the elasticity of a substance?
    a) Hammering   b) Adding impurity in the substance
    c) Changing the dimensions   d) Change of temperature

(xxiii) The bulk modulus of a fluid is inversely proportional to the
    a) Change in pressure   b) Volume of the fluid
    c) Density of the fluid   d) Change in its volume

(xxiv) When a soap bubble is charged
    a) It contracts   b) It expands
    c) It does not undergo any change in size d) None of these

(xxv) The pressure just below the meniscus of water
    a) Is greater than just above it   b) Is less than just above it
    c) Is same as just above it   d) Is always equal to atmospheric pressure

(xxvi) Potential energy of a molecule on the surface of a liquid is as compare to another molecule inside of the liquid is

a) More   b) Less

c) Both 'a' and 'b'   d) None of these

(xxvii) More liquid rises in a thin tube because of

a) Larger value of radius   b) Larger value of surface tension

c) Smaller value of surface tension   d) Smaller value of radius

(xxviii) Two drops of a liquid are merged to form a single drop. In this process

a) Energy is released   b) Energy is absorbed

c) Energy is remains constant   d) First 'B' then 'C'

(xxix) The highest point of syphon is called as

a) syphon top   b) summit

c) reservoir   d) none of these

(xxx) The materials which have low thermal conductivity are called as

a) thermal conductors   b) thermal resistors

c) thermal insulators   d) none of these

(xxxi) In which mode, does the heat energy transfer between two bodies when they are separated by some distance and there is no medium between them?

a) conduction mode of heat transfer   b) convection mode of heat transfer

c) radiation mode of heat transfer   d) heat transfer cannot takes place with above condition

(xxxii) Heat transfer takes place according to

a) First Law of Thermodynamics   b) Second Law of Thermodynamic

c) Third Law of Thermodynamics   d) Zeroth Law of Thermodynamics

(xxxiii) Units for thermal conductivity

a) J/kg.K   b) J/mol.K

c)   d) W/m.K

J.ohm/sec.K^2

(xxxiv) Which of the following has least value of conductivity
   a) glass   b) water
   c) plastic   d) air

(xxxv) A perfect black body is one which
   a) is black in colour   b) reflects all heat
   c) transmits all heat radiations   d) absorbs heat radiations of all wave lengths falling on it

(xxxvi) Cork is a good insulator because it has
   a) free electrons   b) atoms colliding frequency
   c) low density   d) porous body

(xxxvii) Candela is the unit of
   a) Wavelength   b) Luminous intensity
   c) Luminous flux   d) Frequency

(xxxviii) A 200 candle power lamp is hung 4 m above the centre of circular area of 5 m diameter. The illumination at centre of the area is
   a) 13.5 lux   b) 17.5 lux
   c) 12.5 lux   d) 10.5 lux

(xxxix) Lumen/watt is the unit of
   a) Light flux   b) Luminous intensity
   c) Luminous efficiency   d) Brightness

(xl) The nature of the wave front due to a point source of light is

a) Spherical   b) Plane

c) Cylindrical   d) None of these

(xli) A double slit interference experiment is carried out in air and the entire arrangement is dipped in water. The fringe width

a) increases   b) decreases

c) remains unchanged   d) fringe pattern disappears

(xlii) Two waves having intensities in the ratio of 9:1 produce interference. The ratio of maximum to minimum intensity is equal to

a) 10 : 8   b)   3:1

c) 4 : 1   d) 2 : 1

(xliii) SI unit of the power of a lens is _____

a) dioptre   b) cm

c) metre   d) watt

(xliv) The speed of light is_____ in vacuum.

a)   b)

3×10^5 m/s 3×10^6 m/s

c)   d)

3×10^7 m/s 3×10^8 m/s

(xlv) Which of the following is a true statement?

a) The power of a lens is always positive   b) The power of a lens is always negative

c) The power of a convex lens is positive.   d) The power of a concave lens is positive

(xlvi) Which of the following has the highest refractive index?

a) Glass   b) Water

c) Pearl   d) Diamond

(xlvii) Absolute refractive index of any medium is always _____

    a) 1
    b) > 1

    c) < 1
    d) 0

(xlviii) According to the sign convention, the distance of object...

    a) is always positive
    b) is always negative

    c) may be positive or negative
    d) is equal to object height

(xlix) As per second law of refraction, ratio of sine of angle of incidence to sine of angle of refraction is

    a) reflected ray
    b) incident ray

    c) equal to focal length
    d) a constant

(l) In physics terms, light is considered to be which of the following?

    a) Both a wave and a particle
    b) Only a wave

    c) Only a particle
    d) Neither a wave, nor a particle

(li) In a Young's double-slit experiment the center of a bright fringe occurs wherever waves from the slits differ in phase by a multiple of

    a)
    b)

    $\dfrac{\pi}{4}$
    $\dfrac{\pi}{2}$

    c)
    d)

    π
    2π

(lii) Focal length of plane mirror is

    a) at infinity
    b) zero

    c) negative
    d) none of these

(liii) Power of the lens is -40, its focal length is

    a) 4 m   b) -40 m

    c) -0.25 m   d) -25 m

(liv) Which one of the following materials cannot he used to make a lens?

    a) Glass   b) Plastic

    c) Clay   d) Water

(lv) In a photoelectric effect experiment the stopping potential is

    a) the energy required to remove an electron from the sample   b) the kinetic energy of the most energetic electron ejected

    c) the electric potential that causes the electron current to vanish   d) the photon energy

(lvi) Which of the following electromagnetic radiations has photons with the greatest energy?

    a) blue light   b) yellow light

    c) radio waves   d) microwaves

(lvii) Which of the following statement is incorrect

    a) Photoelectric emission does not occur below the threshold frequency   b) The photoelectric current increases with the frequency of incident light

    c) Threshold frequency does not depend on the metal used   d) The emission of photoelectrons is an instantaneous process

(lviii) Solar cells are made of

    a) silicon   b) germanium

    c) silver   d) aluminium

(lix) The photoelectric emission could be explained by the

    a) Wave nature of light   b) Particle nature of light

c) Dual nature of light   d) Quantum nature

(lx) The energy of photon of wavelength 450 nm is

a)   b)

2.5×10^{-17} J 4.4×10^{-19} J

c)   d)

4×10^{-17} J 6.4×10^{-19} J