2019

Engineering Physics-I

Q.1. Choose the correct answer of the following questions:

(i) Which is a fundamental quantity?

(a) Length (b) Velocity
(c) Acceleration (d) Force

Ans.(a)

(ii) Which is a vector quantity?

(a) Force (b) Work
(c) Speed (d) Distance

Ans.(a)

(iii) Dimension of work is-

(a) ML^2T^{-2} (b) ML^4T^{-2}
(c) M^2LT (d) MLT

Ans.(a)

(iv) A liquid does not wet a solid surface if the angle of contact for pair of liquid and solid is -

(a) 0^0 (b) 90^0 (c) 60^0 (d) 120^0

Ans.(d)

(v) Ratio among the coefficients of linear expansion, superficial expansion and cubical expansion is -

(a) 3 : 5 : 4 (b) 1 : 2 : 3
(c) 4 : 3 : 5 (d) 5 : 3 : 4

Ans.(b)

(vi) What type of wave carry sound in air?

(a) Transverse wave (b) Longitudinal wave
(c) Electromagnetic wave (d) None of the above

Ans.(b)

(vii) Equation for kinetic energy is-

(a) $\frac{1}{2}mv^2$ (b) mv^2
(c) $\frac{1}{2}mv^2v^2$ (d) m^2v^2

Ans.(a)

(viii) The gravitational force between two bodies is-

(a) attractive (b) repulsive
(c) both (a) & (b) (d) none of these

Ans.(c)

Q.2(a) State and explain Newton's laws of motion.

Ans. *Refers to chapter 2 Q.no. 4*

Q.2(b) Find the significant figures in the following numbers:

(i) 1.080 (ii) 0.0018 (iii) 108 (iv) 5.98×10^{13}

Ans. (i) 4 (ii) 3 (iii) 3 (iv) 3

Q.3(a) Define angular displacement, angular velocity and angular acceleration. Establish the relation between linear velocity and angular velocity.

Ans. *Refers to chapter 2.2 Q.no. 1 & 2.*

Q3.(b) State and explain Newton's law of gravitation.

Ans. *Refers to chapter 3 Q.no. 1.*

OR

Q3.Define gravitational constant and write the S.I. unit of it.

Ans. *Refers to chapter 3 Q.no. 2.*

Q4.(a)State Hook's law. Define young's modulus; bulk modulus and modulus of rigidity.

Ans. *Refers to chapter 5 Q.no. 2 & 5.*

Q4.(b) Define surface tension. Write its S.I. unit. What is the effect of impurities and tempereature on the surface tension?

Ans. *Refers to chapter 5.2 Q.no. 3.*

Q5.(a) Write Newton's laws of viscosity and define coefficient of viscosity. Write its dimension formula.

Ans. *Refers to chapter 5.3 Q.no. 1.*

Q5.(b) Explain linear expansion, superficial or serial expansion and cubical expansion.

Ans. *Refers to chapter 6 Q.no. 5.*

Q6.(a)Define Amplitude, Time period, frequency and wavelength.

Ans. *Refers to chapter 7 Q.no. 1.*

Q6.(b) Define reverberation time. Write the conditions for good acoustics of building.

Ans. *Refers to chapter 7.2 Q.no. 3*

Q7. A block of wood of mass 3kg is lying on the frictionless table. A force of 9N is applied on it for 10 seconds. Calculate the kinetic energy.

Ans. Given: m = 3kg, F = 9N

$\therefore$ Acceleration, $a = \frac{F}{m} = \frac{9}{3} = 3\,m/s^2$

Velocity attained by body after 10 second.

$V = 4 + at$

$\Rightarrow V = 0 + 3 \times 10$

$= 30$ m/s

$\therefore$ K.E of the body $= \frac{1}{2}mv^2$

$= \frac{1}{2} \times 3 \times 30 \times 30$

$= 1350$ J

2018

Engineering Physics-I

Q1. Choose the correct answer:

(i) How many significant degits are in 0.04058?

(a) 4 (b) 5 (c) 6 (d) 3

Ans.(a)

(ii) When we kick a stone, we get hurt this is due to

(a)Reaction (b)Velocity (c)momentum (d)inertia

Ans.(c)

(iii) The mass of the body is halved and its speed is doubled. What happen to the K.E of the body

(a) double (b)4 times (c) 8 times (d) remains unchanged

Ans.(b)

(iv) Viscosity is a property of

(a)liquid only (b)Solid only

(c)solid and liquid only (d)liquid and gases only

Ans.(d)

(v) The spherical shape of rain drop is due to

(a)density of water (b)atmospheric pressure

(c)gravity (d)surface tension

Ans.(d)

(vi) Which one of the following substances possess the highest elasticity?

(a)rubber (b)glass (c)steel (d)copper

Ans.(c)

(vii) As we go from equator to poles, the value of g

(a)remains the same (b)increases

(c)decreases (d)decreses upto a latitude of 45°

Ans.(b)

(viii) A thin circular disk has a concentric hole in it. The disc is heated, the volume of the cavity will

(a)increase (b) decrease

(c)remain unchanged (d)none of these

Ans.(b)

(ix) Echo is

(a)ghost talking (b)double vibration of air

(c)reflection of sound (d)none of these

Ans.(c)

(x) In a stationary wave, node is a point having

(a)maximum density (b)maximum displacement

(c)minimum amplitude (d)maximum stress

Ans.(c)

Q2.(a) State and explain Newtons law of gravitation? define the gravitational constant(G). What is its S.I units?

Ans. Refers to chapter 3 Q. no. 1 & 2

Q2.(b) What is simple harmonic motion ? Find the expression for velocity and acceleration of a body executing SHM.

Ans. Refers to chapter 2.2 Q. no. 3 & 4

Q3.(a) Define the term: accuracy, precision, absolute error and percentage error.

Ans. Refers to chapter 1 Q. no. 7 & 9

Q3.(b) Define surface tension and write its S.I unit. How will you explain pheonomenon on the basis of molecular theory?

Ans. Refers to chapter 5.2 Q. no. 2 & 3

Q4.(a) State and explain Newton's laws of motion.

Ans. Refers to chapter 2.1 Q. no. 4

Q4.(b) What are the concept of scalar and vector quantities.

Ans. Refers to chapter 2.1 Q. no. 1

Q5.(a) Defines Acoustics. What are the condition for good acoustics ?

Ans. Refers to chapter 7.2 Q. no. 1 & 3

Q5.(b) Explain the differents modes of transmission of heat with examples.

Ans. Refers to chapter 6 Q. no. 1

Q6. Define work, energy and power. What is work- energy principle ?

Ans. Refers to chapter 4 Q. no. 6 & 8

Q7.(a) Define stress and strain with there types. Also write there unit?

Ans. Refers to chapter 5.1 Q. no. 2 , 3 & 4

Q7.(b) Calculate the strain produced in a material if the stress the 2000kg/m² and Y = 2 × 10⁴ kg/m².

Ans. Refers to chapter 5.1 (Solved Example)

Q8. What is viscosity ? State Newtons law of viscocity and derive the expression for coefficient of viscocity .

Ans. Refers to chapter 5.3 Q. no. 1 & 4

Q9. Define amplitude, period, frequency and wavelength.

Ans. Refers to chapter 7.1 Q. no. 1

OR

Q. If the broad casting frequency of wave is 20 × 10⁶ Hz, Calculate its wavelength?

Ans. Refers to chapter 7.1 Q. no. 7

2017

Engineering Physics-I

Q1. Choose the correct answer in the following questions :

(i) Which of the following is not a unit of time ?

(a) Second (b) month
(c) year (d) light year

Ans. (d)

(ii) Steel is preferred for making springs over copper. Why?

(a) Steel is cheaper
(b) Young's modulus of steel is more than that of copper
(c) Young's modulus of copper is more than that of steel
(d) Steel is less likely to be oxidised

Ans. (b)

(iii) The surface tension does not depend upon

(a) nature of the liquid (b) temperature
(c) Presence of impurities (d) atmospheric pressure

Ans. (c)

(iv) Viscosity is exhibited by

(a) solids, liquids and gases (b) only solids & liquids
(c) only liquids & gases (d) only gases & solids

Ans. (b)

(v) The equation for the adiabatic change in a gas is PVʳ = a constant, where r stands for { where Cp and Cv represent the principal specific heats of the gas }

(a) Cv/ Cp (b) Cp - Cv (c) Cp . Cv (d) Cp/Cv

Ans. Out of syllabus

(vi) Thrmal conductivity of a material depends upon

(a) temperature difference (b) area
(c) thickness (d) None of the above

Ans. (a)

(vii) When light travels from air to glass, which of the following properties does not change ?

(a) Frequency (b) velocity
(c) Amplitude (d) Wavelength

Ans. out of syllabus

(viii) When a stone is dropped on the surface of the still water the wave produce are

(a) transverse (b) longitudinal
(c) stationary (d) None of the above

Ans. (d)

(ix) Laser light is produced by

(a) Spontaneous emission (b) stimulated emission
(c) Stimulated absorption (d) spontaneous absorption

Ans. out of syllabus

(x) Who discovered X - rays ?

(a) Lave (b) Moseley
(c) Compton (d) Roentgen

Ans. Out of syllabus

Q2. (a) Define the terms - accuracy, precision and error. Explain absolute error, relative error & percentage error. What are significant figure ?

Ans. Refers to chapter 1 Q. no. 7, 9 & 10

Q2.(b) What do you understand by Modulus of Elasticity ? Explain young's Modulus, Bulk Modulus & Modulus of rigidity. Also write the relation between them.

Ans. Refers to chapter 5.1 Q.no. 5

Q3. (a) Define surface tension. Explain the phenomenon of surface tension on the basis of molecular theory. What is the effect of impurity on surface tension ?

Ans. Refers to chapter 5.2 Q.no. 3 & 2

Q3.(b) What do you mean by viscosity ? Define coefficient of viscosity and give its S.I. unit. Also explain the terms streamline flow, turbulent flow & critial velocity.

Ans. Refers to chapter 5.3 Q.no. 1 & 5 .

Q4. Explain dispersion and diffraction of light along with ray diagram. What is polarization ?

Ans. Out of syllabus.

Q5. What do you understand by fundamental and derived quantities ? Give examples.

Ans. Refers to chapter 1 Q.no. 3

Q6. Explain the modes of transmission of heat .

Ans. Refers to chapter 6 Q.no. 1

OR

A gas at 30°C is heated at constant pressure till its volume is doubled. Calculate the final temperature of the gas.

Ans. Out of syllabus