engineering physics
(2013)

Q.1 Choose the correct answer in the following question :

(i) The S.I. unit of luminous intensity is

(a) lumen (b) watt

(c) candela (d) ampere

Ans. (c)

(ii) Which one of the followings substances possesses the highest elasticity ?

(a) Rubber (b) Glass

(c) Steel (d) Copper

Ans.: (c)

(iii) The drying of hands by towel is due to

(a) evaporation (b) surface tension

(c) capillarity (d) viscosity

Ans.(a)

(iv) The spherical shape of rain drops is due to

(a) density of water (b) atmospheric pressure

(c) gravity (d) surface tension

Ans.(d)

(v) On increasing temperature, the co-efficient of viscosity of a liquid

(a) increase (b) decreases

(c) first increases then decreases (d) remains constant

Ans.(b)

(vi) The pitch of a screw is equal to

(a) the area of its head (b) the thickness of the screw

(c) the length of threading of on it

(d) the distance moved ahead by it in one rotation

Ans.(d)

(vii) Which one of the following statements is true about a gas undergoing an isothermal change ?

(a) The temperature of the gas remains constant
(b) The pressure of the gas remains constant
(c) The volume of the gas remains constant
(d) The gas is completely insulated from the surroundings

Ans.(d)

(viii) The S.I. unit of co-efficient of thermal conductivity is

(a) joule (b) watt/m-K
(c) watt-Kelvin-metre (d) joule/second

Ans.(b)

(ix) The specific heat capacities of a gas at constant volume (Cv) and at constant pressure (Cp) are related as

(a) $Cp - Cv = \frac{J}{R}$ (b) $Cp + Cv = \frac{R}{J}$

(c) $\frac{Cp}{Cv} = 1 - \frac{R}{J}$ (d) $Cp - Cv = \frac{R}{J}$

Ans. (a)

(x) A monochromatic beam of light passes from a denser medium to a rarer medium. As a result

(a) its velocity increases (b) its velocity decreases
(c) its frequency decreases (d) its wavelength decreases

Ans. (a)

(xi) The phenomenon of interference is used to prove that light is

(a) longitudinal (b) transverse
(c) stationary wave (d) quantized

Ans.(b)

(xii) The main characteristics of LASER radiations are

(a) coherence (b) monochromaticity
(c) high directionality and extreme brightness
(d) all the above

Ans.(d)

(xiii) Which is the case of forced vibrations ?

(a) sound produced in organ pipe
(b) sound produced in flute
(c) vibrations produced in piano string
(d) vibrations produced in telephone transmitter during conversion

Ans.(a)

(xiv) X-ays are emitted due to

(a) the breaking of nucleus
(b) the decay of neutrons
(c) electronic transitions taking place in inner most orbits of target atoms
(d) electronic transitions taking place in valence band of target atoms

Ans.(c)

(xv) The work function of a photo-metal is rerated to

(a) frequency of incident radiation
(b) intensity of incident radiation
(c) the threshold frequency for the metal
(d) shape of the photo-cathode

Ans.(c)

(xvi) X-ray exposure is most dangerous for

(a) bones (b) skin
(c) white blood corpuscles (d) lungs

Ans.(c)

(xvii) Photo-electric cell is a device which converts

(a) light energy into electric energy
(b) chemical energy into electrical energy
(c) electric energy into light energy
(d) magnetic energy into electrical energy

Ans.(a)

(xviii) In a wave motion, the maximum displacement is ca

(a) amplitude (b) wavelength
(c) frequency (d) intensity

Ans.(a)

(xix) Electron volt is the unit of

(a) charge (b) potential difference
(c) current (d) energy

Ans.(d)

Q3. Define surface tension and state its S.I. unit. How will y explain this phenomenon on the basis of molecular the ? What is the effect of impurity on surface tension ?

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

Q.4 What do you understand by isothermal and adiaba expansion of a gas ? Define the two specific heat capaciti of gas and explain why gases have two specific he capacities while solids and liquids have only one ?

Ans.: Out of Syllabus

Q.5 What do you understand by reflection and refraction light ? State Snell's law of refraction. What is refracti index and what is its physical significance ?

Ans.Out of Syllabus

Q.6 What are X-rays ? Describe the production of X-rays usi Coolidge tube with a neat diagram.

Ans.Out of Syllabus

Q.7 Define stress, strain and elastic limit.

Ans. Refers to Chapter 5.1 Q.no. 2

Q.8 Explain viscosity and co-efficient of viscosity.

Ans. Refers to Chapter 5.3 Q.no. 1

Q.9Explain the different modes of transmission of heat with examples.

Ans. Refers to Chapter 6 Q.no. 1

Q.10mWhat are longitudinal and transverse waves? Define stationary wave.

Ans.: Refers to Chapter 7.1 Q.no. 3

Q.11What is absolute zero temperature and what is its value in centigrade scale ?

Ans.Out of Syllabus

Q.12 Define photo-electric effect and explain Einstein's photo-electric equation.

Ans.Out of Syllabus

Q.13 What is the full form of LASER ? Mention some of the important properties of laser.

Ans.Out of Syllabus

Q.14 A load of 2kg produces an extension of 1mm in a wire of 3 metres in length and 1mm in diameter. Calculate the Young's modulus of the wire.

Ans. Refers to Chapter 5.1 (Solved Example)

Q.15 When a metallic bar is heated from 0°C to 1000°C, its length increases by 0.05%. What is the co-efficient of linear expansion of the metal ?

Ans. Refers to Chapter 6 (Solved Example- 4)

Q.16 Find the minimum wavelength of X-rays produced by an X-ray tube operated at 1000 KV. (Given, $h = 6.63 \times 10^{-34}$ joule-sec, $e = 1.6 \times 10^{-19}$ C and $C = 3 \times 10^{8}$ m/s).

Ans.Out of Syllabus