Engineering physics (2014)

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

(i) How many basic units are included in S.I ?

(a) 3 (b) 4 (c) 5 (d) 7

Ans.(d)

(ii) Steel is more elastic than rubber because for a given stres strain produced in steel is

(a) equal to that in rubber (b) greater than in rubber

(c) less than in rubber (d) none of these

Ans. (c)

(iii) Soap helps in better cleaning of cloths because

(a) it reduces the surface tension of solution

(b) it gives strength to the solution

(c) it absorbs the dirt

(d) chemicals of soap change

Ans. (a)

(iv) The viscous force between two liquid layers is

(a) radial

(b) normal to the liquid surface

(c) tangential to the liquid surface

(d) neither purgly tangential nor purely normal

Ans.(c)

(v) The ratio of co-efficients of cubical expansion and linea expansion is

(a) 1 : 1 (b) 3 : 1 (c) 2 : 1 (d) none

Ans.(b)

(vi) When a ray of light enters a denser medium, it

(a) bends away from the normal

(b) bends towards the normal

(c) goes undeviated (d) is reflected back

Ans.(b)

(vii) LASER is based on the principle of :

(a) total internal reflection (b) refraction

(c) population inversion (d) spontaneous emission

Ans.(d)

(viii) Resonance is an example of

(a) tuning form (b) forced vibrations

(c) free vibrations (d) damped vibrations

Ans.(d)

(ix) In photo-electric effect, the incident photon is

(a) completely absorbed

(b) scattered elasticity

(c) sctered in elasticity

(d) absorbed and emitted at a greater frequency

Ans. (d)

(x) Specific heats of a gas at constant volume (C_v) and at constant pressure (C_p) are related as

(a) $\frac{C_p}{C_v} = 1 - \frac{R}{J}$ (b) $C_p - C_v = \frac{R}{J}$

(c) $C_p - C_v = \frac{J}{R}$ (d) $C_p + C_v = \frac{R}{J}$

Ans.(b)

Q2.(a) Explain the behaviour of a wire under continuosly increasing load using stress diagram.

Ans. Refers to Chapter 5.1 Q.No. 6 Page No. 25,26

Q2.(b) Define surface tension and write its S.I. unit. What is angle is contact ?

Ans. Refers to Chapter 5.2 Q.No. 3,4 Page No. 28,29

OR

Q2.(a)Explain Young's modulus and Bulk modulus of elasticity and write their S.I. unit.

Ans. Refers to Chapter 5.1 Q.no. 5

Q2.(b) What is effect of impurity and temperature on surface tension.

Ans. Refers to Chapter 5.2 Q.no. 3

Q3.(a) What do you mean by viscosity ? Define co-efficient of viscosity and write its S.I. unit.

Ans. Refers to Chapter 5.3 Q.no. 1

Q3.(b) What is photo-electric effect ? Define work function and write Einstein's photo-electric equation.

Ans.Out of Syllabus

Q4.(a) ***Define dispersion and diffraction of light along with ray diagram.***

Ans.Out of Syllabus

Q4.(b)Define wave motion, amplitude, frequency and wavelength.

Ans. Refers to Chapter 7.1 Q.no. 1

OR

Q4.(a) Define stationary wave, node and antinode.

Ans. Refers to Chapter 7.1 Q.no. 3

Q4.(b)Explain the phenomenon of refraction of light. Also write Snell's law.

Ans. Out of Syllabus

Q.5. Write the fundamental quantities in S.I. with their units.

Ans. Refers to Chapter 1 Q.no. 3

Q.6 State Boyle's law and Charle's law.

Ans.Out of Syllabus

Q.7 Define the co-efficient of thermal conductivity and write its S.I. unit.

Ans. Refers to Chapter 6 Q.no. 3

OR

Q. A thin square metallic sheet at 0°C has each side 1m. When heated to 100°C, each side of the metallic sheet becomes 1.01 m. Calculate the coefficients of linear and superficial expansion.

Ans. Refers to Chapter 6 (Solved .Example-2)

Q.8 What is meant by population inversion and optical pumping ?

Ans.Out of Syllabus

Q.9 Write four properties of X-rays.

Ans.Out of Syllabus

OR

Q. A coolidge tube operates at 50 KV. Find the minimum wavelength of X-rays generated.

Ans. Out of Syllabus