



PHYSICS

BOOKS - KCET PREVIOUS YEAR PAPERS

MODEL TEST PAPER 10

Physics

1. A convex lens has mean focal length of 15 cm. The dispersive power of the material of

prism is 0.01. What is the longitudinal chromatic aberration for the lens ?

A. Chromatic aberration and spherical aberration

B. Curvature and Coma

C. Astigmatism and distortion

D. All of these

Answer: D



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2. A transformer works on the principle of

A. Newton

B. Bernoulli

C. Archimedes

D. Pascal

Answer: B



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3. The viscous drag on a liquid layer does not depend on

A. Area

B. The liquid

C. Velocity gradient

D. All of these

Answer: D



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4. $104^{\circ} F$ corresponds to what temperature on Kelvin scale ?

A. 313

B. 377

C. 308

D. 418

Answer: A



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5. Auxanometer is used to measure

- A. Very low temperature
- B. Very high temperature
- C. Temperature upto $250^{\circ} C$
- D. Quantity of heat

Answer: B



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6. The parameter α and β are related to each other by the equation

A. $\alpha = \frac{\beta}{(1 + \beta)}$

B. $\alpha = \frac{(\beta - 1)}{\beta}$

C. $\alpha = \frac{(1 + \beta)}{\beta}$

D. $\alpha = \frac{\beta}{(\beta - 1)}$

Answer: A



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7. The nuclear size of atom depends on its

A. Atomic number

B. Neutron number

C. Mass number

D. none of these

Answer: C



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8. Half life T of a radioactive element is related to decay constant λ according to the relation

A. $T = \frac{\lambda}{0.693}$

B. $T = \frac{1}{\lambda}$

C. $T = \frac{0.693}{\lambda}$

D. $T = \frac{\lambda}{2}$

Answer: C



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9. Whole number of rule was proposed by

A. Dalton

B. Thomson

C. Proust

D. Soddy

Answer: C



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10. Iodine is soluble in water in the presence of

:

A. Photosphere

B. Corona

C. Chormosphere

D. All these

Answer: C



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11. State the principle of conservation of charge .

A. Mass

B. Momentum

C. Charge

D. Energy

Answer: D



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12. The thermo-electric power P of a thermocouple is given by

A. $P = a\theta + b\theta^2$

B. $P = a\theta^2 + b\theta^3$

C. $P = a + 2b\theta$

D. none of these

Answer: C



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13. The SI unit of self - induction is

A. Faraday

B. Maxwell

C. Henry

D. Tesla

Answer: C



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14. A six volt battery is connected with a resistance . A current of 2 amperes flows for 4 minutes . Which of the following statement is wrong ?

A. Resistance is 3Ω

B. Heat produced is 12 Joules

C. Power consumed is 12 Watts

D. Charge flowed is 480 coulomb

Answer: B



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15. The relation connecting deflection θ , current I and reduction factor K of a tangent galvanometer is

A. $I = K \sin \theta$

B. $I = K \tan \theta$

C. $I = K \cos \theta$

D. $I = K \cot \theta$

Answer: B





16. Which of the following statement is not correct ?

A. The discharging action of points

B. Charge residing on the outer surface of
a charged conductor

C. The production of charge by induction

D. All the above

Answer: D



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17. To charge a body to +1 coulomb (charge of an electron = $1.6 \times 10^{-19} C$)

- A. 6.25×10^{18} electrons must be added
- B. One electron has to be removed
- C. A charge of -1 coulomb must be added
- D. 6.25×10^{18} electrons must be removed

Answer: D



18. How are magnetic susceptibility 'x' and relative magnetic permeability (μ_r) related ?

A. 1999

B. 8000π

C. 2001

D. $\frac{500}{\pi}$

Answer: C



19. The horizontal and vertical components of the earth's magnetic field at a place are 30 and 40 SI units .

The total intensity in SI Units is

A. 70

B. 10

C. 50

D. 1200

Answer: C



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20. The magnetic intensity at a point distant x from a pole of strength m is given by

A. $\frac{\mu_0 m}{4\pi x^2}$

B. $\frac{\mu_0 x}{4\pi m^2}$

C. $\frac{\mu_0 m x}{4x}$

D. $\frac{4\pi m}{\mu_0 x^2}$

Answer: A



21. The specific rotation of liquid of length 1 dm , concentration $2.5\text{kg}/\text{m}^3$ is 40° . The angle of rotation is

A. 10°

B. 80°

C. 70°

D. 90°

Answer: A



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22. The refractive indices for two spectral lines are 1.49 and 1.51, then dispersive power of the material of the prism is

A. 0.02

B. 0.03

C. 0.04

D. none of these

Answer: C



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23. Two thin lenses of focal lengths f_1 and f_2 are in contact. The focal length of this combination is

A. $\frac{(f_1 + f_2)}{2}$

B. $\frac{f_1 f_2}{(f_1 + f_2)}$

C. $\sqrt{f_1 f_2}$

D. none of these

Answer: B



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24. If C is the critical angle for a medium and μ is its refractive index, then

A. $\mu = \cot C$

B. $\mu = \tan C$

C. $\mu = \operatorname{cosec} C$

D. $\mu = \sec C$

Answer: C



25. Which of the following relation hold good for refraction between a pair of media with i_1 and i_2 as angles incidence and refraction v_1 and v_2 as velocities of light in the media ?

A. $v_1 \sin i_1 = v_2 \sin i_2$

B. $v_1 \cos i_1 = v_2 \cos i_2$

C. $v_1 \operatorname{cosec} i_1 = v_2 \operatorname{cosec} i_2$

D. $v_1 \sec i_1 = v_2 \sec i_2$

Answer: C



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26. The weight of fruit in a plant is determined by the number of dominant alleles of a certain number of genes. If seven weight categories are noticed, how many gene sites would be involved?

A. Electrons

B. Neutrons

C. Nucleons

D. All of these

Answer: B



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27. Line spectrum is due to

A. Molecular structure

B. Nuclear structure

C. Atomic structure

D. All of these

Answer: C



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28. The impurity added in Germanium crystals to make n -type semi-conductor is

A. Germanium doped with arsenic

B. Silicon doped with Antimony

C. Germanium doped with Antimony

D. Germanium doped with Indium

Answer: D



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29. At neutral temperature, the thermoelectric

power $\left(\frac{dE}{dT}\right)$ has the value

A. Positive

B. Zero

C. Negative

D. Maximum

Answer: B



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30. A circular coil has one turn and carries a current I . The same wire is wound into a smaller coil of 4 turns and the same current is passed through it. The field at the centre :

A. Decreases to $\frac{1}{4}$ th the value

B. Increase to 16 times the value

C. Increase to 4 times the value

D. Remains the same

Answer: B



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31. A unit cube of copper and iron have

A. Same R and same σ

B. Same R and difference σ

C. Different R and difference σ

D. Remains the same

Answer: C



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32. Define temperature gradient in a conductor.

A. Conductor

B. Super conductor

C. Insulator

D. Inductor

Answer: C



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33. The resistance of a shunt which should be connected across a galvanometer of resistance 2100Ω , so that only 5% of current passes through it is

A. 220.5Ω

B. 55.27Ω

C. 110.5Ω

D. 98.27Ω

Answer: C



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34. A cylindrical conductor is placed near another positively charged conductor. The net

charge acquired by the cylindrical conductor will be:

- A. Becomes zero
- B. Decrease
- C. Remains constant
- D. Increases .

Answer: D



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35. In textile mills , the atmosphere is rendered humid to

A. Prevent the cloth from getting heated

B. Supply opposite charges to neutralise the charged produced by friction

C. Prevent the workers from getting tired

D. Remove the electrostatic charges which may result in fire

Answer: D

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36. An equipotential line and a line of force are

A. perpendicular to each other

B. inclined at an angle of 45°

C. Parallel to each other

D. Inclined at any angle

Answer: A

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37. A deflection magnetometer is set in tan A position. A short bar magnet of moment $4A - m^2$ is placed on one of the arms with its axis in the direction of the earth's field and with its centre at a distance of 0.2 m from the centre of the needle. Then the deflection in the compass box is found to be

A. $0^\circ - 0^\circ$

B. $60^\circ - 60^\circ$

C. $30^\circ - 30^\circ$

D. $90^\circ - 90^\circ$

Answer: A



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38. The process of separation of colloids by passing through semi-permeable membrane is called:

A. Isogonal

B. Isodynamic

C. Isoclinic

D. Isomagnetic

Answer: A



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39. Two magnets of magnetic moment M_1 and M_2 experience the same couple in the uniform magnetic field when their axes are at 30° and 60° respectively with the direction of the field. The ratio $M_1 : M_2$ is

A. $1 : \sqrt{2}$

B. $1 : \sqrt{3}$

C. $\sqrt{2} : 1$

D. $\sqrt{3} : 1$

Answer: D



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40. At the polarising angle, the angle between reflected and refracted rays is

A. 0°

B. 180°

C. 90°

D. 60°

Answer: C



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41. The property of rotating the plane of polarization is known as

- A. Optical activity
- B. Dichroism
- C. Specific rotation
- D. None of the above

Answer: A



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42. Lux is the unit of

- A. Luminous flux

B. Illumination

C. Luminous intensity

D. Brightness

Answer: B



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43. A double convex lens is immersed in water .

Its focal length

A. Increases

B. Remains the same

C. Decreases

D. Becomes zero

Answer: A



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44. When a ray of light passes from air medium to denser medium then the refractive index is

A. λ increases

B. n increases

C. λ decreases

D. n decreases

Answer: C



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45. A ray of light incident normally on one face of a prism ($\mu = 2$) undergoes grazing emergence. The angle of the prism is

A. 50°

B. 45°

C. 30°

D. 60°

Answer: C



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46. Two slabs different materials with identical dimensions have their thermal conductivities λ_1 and λ_2 respectively . When they are placed

in contact with each other such that heat flows from one into the other (placed in series) , the equivalent thermal conductivity of the composite wall is given by

A. $\frac{\lambda_1 \lambda_2}{\lambda_1 + \lambda_2}$

B. $\lambda_1 + \lambda_2$

C. $\frac{2\lambda_1 + \lambda_2}{\lambda_1 + \lambda_2}$

D. $\frac{\lambda_1 + \lambda_2}{2}$

Answer: A



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47. At what temperature does the Fahrenheit and Kelvin scales coincide ?

A. 491.69°

B. 243°

C. -40°

D. 574.25°

Answer: C



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48. Two liquids A and B are at $30^{\circ}C$ and $20^{\circ}C$, respectively. When they are mixed in equal masses, the temperature of the mixture is found to be $26^{\circ}C$. The ratio of their specific heat is

A. 4 : 3

B. 2 : 3

C. 3 : 2

D. 3 : 6

Answer: C



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49. A fixed mass of gas ($\gamma = 1.4$) at 1 atmospheric pressure is compressed under adiabatic condition to 5 atmospheres and then allowed to expand isothermally to its original volume. The final pressure is

- A. 5 atmospheres
- B. 1 atmospheres
- C. 1.6 atmospheres

D. none of the above

Answer: C



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50. Diatomic gas at pressure 'P' and volume 'V' is compressed adiabatically to $\frac{1}{32}$ times the original volume. Then the final pressure is

A. $32 P$

B. $P/128$

C. 128P

D. P/32

Answer: C



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51. A slab consists of two parallel layers of copper and brass of same thickness and having thermal conductivities in the ratio 4:1 . If the free face of brass is at $100^{\circ} C$ and that of copper of $0^{\circ} C$, the temperature of interface is

A. $80^{\circ} C$

B. $60^{\circ} C$

C. $20^{\circ} C$

D. $40^{\circ} C$

Answer: C



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52. When an air bubbles reaches the top of a lake from the bottom , its volume becomes 8

times . If the atmospheric pressure is 75 cms of Hg , the depth of lake is nearly

A. 710 cm

B. 7cm

C. 71 cm

D. $75 \times 8m$

Answer: C



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53. A wooden cube first floats inside water when a 200 g mass is placed on it. When the mass is removed the cube is 2 cm above water level. The side of cube is

A. 6 cm

B. 10 cm

C. 8 cm

D. 5 cm

Answer: A



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54. In a stationary longitudinal wave, nodes are points of

- A. Minimum pressure
- B. Minimum pressure variation
- C. Maximum pressure
- D. Maximum pressure variation

Answer: C



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55. If in an experimental determination of the velocity of sound using a Kundt's tube, standing waves are set up in the metallic rod as well as in the rigid tube containing air, then both the waves have the same

A. Amplitudes

B. Wavelengths

C. Frequency

D. Particle velocities

Answer: C



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56. Consider the following statements:

Ultrasonic waves can be used to

- (1) Transform two immiscible liquids like water and oil into a stable emulsion
- (2) Detect blow holes and cracks inside mould
- (3) Remove dirt , stain and dust particles in clothes of these statements .

A. 1 and 2 are correct .

B. 1 and 3 are correct

C. 2 and 3 are correct

D. 1,2 and 3 are correct

Answer: D



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57. A plane wave is described by the equation

$y = 3 \cos\left(\frac{x}{4} - 10t - \frac{\pi}{2}\right)$. The maximum

velocity of the particles of the medium due to this wave is

A. 30

B. 20

C. $\frac{3\pi}{2}$

D. 40

Answer: A



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58. Stationary waves of frequency 300 Hz are formed in a medium in which the velocity of sound is 1200 metre / sec . The distance between a node and the neighbouring antinode is

A. 1 m

B. 3 m

C. 2m

D. 6 m

Answer: A



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59. A particle is executing simple harmonic motion given by

$$x = 5 \sin\left(4t - \frac{\pi}{6}\right)$$

The velocity of the particle when its displacement is 3 units is

A. $\frac{2\pi}{3}$

B. 20

C. $\frac{5\pi}{6}$

D. none of these

Answer: D



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60. A progressive wave on a string is represented by the equation

$$y = 0.2a \sin\left(\pi bx - 2\pi kt + \frac{\pi}{6}\right). \quad \text{The}$$

amplitude of the wave is

A. $\frac{22}{7}b$

B. $0.2a$

C. $2a$

D. a^2

Answer: B



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