



PHYSICS

BOOKS - KCET PREVIOUS YEAR PAPERS

MODEL TEST PAPER - 8

Physics

1. Rate of normal flow of heat in Searle's method for thermal conductivity is

A. $Q/t = (KA d) / (\theta_1 - \theta_2)$

B. $Q/t = Ka(\theta_1 - \theta_2) / d$

C. $Q/t = K(\theta_1 - \theta_2) / Ad$

D. $Q/t = KA / [d(\theta_1 - \theta_2)]$

Answer: b



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2. The difference between the specific heat ...
of a gas is independent of the gas constant

A. Per unit volume

B. Per mole

C. Per unit mass

D. None of these

Answer: B



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3. If the temperature of a gas occupying volume V is raised from $27^{\circ}C \rightarrow 627^{\circ}C$ at constant pressure, its volume will become

A. 2V

B. 4V

C. 3V

D. 10 V

Answer: A



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4. In an experiment to compare the magnetic moment of two magnets using a vibration magnetometer, the period of oscillation was

found to be 10 sec when the like poles were together and 20 sec when unlike poles were together. The moment of the magnets are in the ratio

A. 5 : 3

B. 1 : 5

C. 3 : 5

D. 1 : 3

Answer: A



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5. Give the expression for period of oscillation of a magnetic dipole (magnetic needle) in an uniform magnetic field and the meaning of the symbols.

$$A. T = \frac{1}{2\pi} \sqrt{\frac{1}{MB}}$$

$$B. T = 4\pi \sqrt{\frac{MI}{B}}$$

$$C. T = 2\pi \sqrt{\frac{1}{MB}}$$

$$D. T = 2\pi \sqrt{\frac{MB}{I}}$$

Answer: C



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6. Draw a line segment of length 7.6 cm and divide it in the ratio 3 : 2.

A. 5 : 10

B. 8 : 1

C. 1 : 8

D. 10 : 5

Answer: C



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7. A tangent galvanometer has a reduction factor of 1 A and it is placed with the plane of its coil perpendicular to the magnetic meridian. The deflection produced when a current of I A is passed through it is

A. To make the axis of magnet and magnetic meridian parallel

B. To make the instrument look beautiful

C. To make the axis of magnet and magnetic meridian perpendicular

D. Just for convenience

Answer: C



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8. The magnetic moment of two magnets can be compared using.

A. A voltmeter

B. A voltmeter

C. An ammeter

D. A magnetometer

Answer: D



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9. The equation of a stationary wave is given by $y = 5 \cos \left(\frac{\pi x}{3} \right) \sin 40\pi t$, where y and x are given in metres and t in seconds, then the amplitude of the progressive wave is

A. 0.025 m

B. 0.01 m

C. 0.05 m

D. 0.03 m

Answer: A



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10. A tuning fork of frequency 90 is sounded and moved towards an observer with a

velocity of sound, the note heard by the observer

A. 90

B. 95

C. 80

D. 100

Answer: D



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11. Quality of a sound depends upon its

A. Wavelength

B. Overtones

C. Frequency

D. Velocity

Answer: C



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12. A transverse wave of amplitude 0.5 m and wavelength 1 m and frequency 2 Hz is propagating in a string in the negative direction. The expression for this wave is

A. $f(x, t) = 0.5 \sin(2\pi x - 4\pi t)$

B. $f(x, t) = 0.5 \cos(\pi x - 2\pi t)$

C. $f(x, t) = 0.5 \sin(2\pi x + 4\pi t)$

D. $f(x, t) = 0.5 \cos(2\pi x + 2\pi t)$

Answer: C



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13. A man on the ground finds that when he sees a jet plane just over his head, the sound is heard at an angle of 30° with the vertical from his left. If the velocity of sound is v , what is the velocity of the jet plane?

A. $v/2$

B. $2\sqrt{3}/2$

C. $2v$

D. $2v/\sqrt{3}$

Answer: A



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14. A vessel has a height of 50 cm. What is the maximum distance at which water can fall from a hole on its side?

A. 25 cm

B. 40 cm

C. 33.3 cm

D. 50 cm

Answer: B



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15. A block of wood floats in water in a vessel $1/10$ of its volume exposed. Sufficient oil of density 0.8 g/cm^3 is poured into the vessel till the block is completely submerged. What percentage of its volume in the water now?

A. 0.8

B. 0.6

C. 0.75

D. 0.5

Answer: D



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16. A log of wood floats in water $\frac{3}{4}$ immersed.

What is its volume if it is just submerged when a body of mass 50 kg stands on it?

A. $0.1m^3$

B. $0.2m^3$

C. $0.15m^3$

D. $0.25m^3$

Answer: B



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17. In the determination of resistance R is calculated from $R = V/I$ where V is the reading of the voltmeter and I is the reading of the ammeter. The values obtained are

$V = 10 \pm 0.2V$ and $I = 0.5 \pm 0.01A$. The maximum percentage error in the measurement of resistance is

A. 0.2 %

B. 0.4 %

C. 0.3 %

D. 4 %

Answer: D



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18. In the equation $y = a \sin (kt - x / \lambda)$ the dimensions of k are

A. $M^{\circ} L^{\circ} T^{\circ}$

B. $M^{\circ} L^{\circ} T^{\circ}$

C. $M^{\circ} L^{\circ} t^{-2}$

D. $M^{\circ} L^{\circ} T^{-1}$

Answer: D



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19. In a new system of units, the units of mass, length and time are α kg, βm and γ s respectively. In the new system a force of one newton (1 N) will have magnitude

A. $\alpha^1 \beta^1 \gamma^{-2}$

B. $\alpha^1 \beta^1 \gamma^{-1}$

C. $\alpha^{-1} \beta^{-1} \gamma^{-1}$

D. $\alpha \beta \gamma$

Answer: A



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20. If the earth were to suddenly shrink to I/n of its present radius without any change in its mass the duration of the new day will be

A. $\frac{24}{n} \text{ hrs}$

B. $24 n^2 \text{ hrs}$

C. $\frac{24}{n^2} \text{ hrs}$

D. $\frac{24}{\sqrt{n}} \text{ hrs.}$

Answer: C





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21. Line spectrum is due to

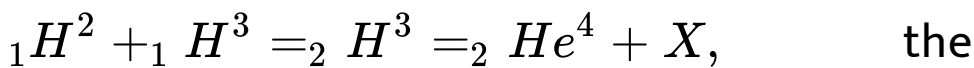
- A. A solid heated in incandescence
- B. Gasses in molecular state
- C. Gasses in atomic state
- D. None of these

Answer: C



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22. In the nuclear reaction,



the emitted particle X is

A. Proton

B. Positron

C. Electron

D. Neutron

Answer: D



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23. The photoelectric threshold frequency for potassium is 3×10^{14} Hz. The work function for potassium is ($h = 6.625 \times 10^{-34} \text{ Js}$)

A. $1.987 \times 10^{-19} \text{ J}$

B. $1.987 \times 10^{+19} \text{ J}$

C. $1.987 \times 10^{-13} \text{ J}$

D. $1.987 \times 10^{+13} \text{ J}$

Answer: A



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24. A radiation of wavelength 2000 Å lies in the

- A. Infrared region
- B. Visible region
- C. Ultraviolet region
- D. X-ray region

Answer: C



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25. The mass of a neutron

- A. Is exactly equal to that of a proton
- B. Is slightly greater than that of a proton
- C. Is exactly equal to that of an electron
- D. Varies slightly depending on the nucleus,
in which it is present

Answer: B



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26. The peak value of a certain sinusoidal AC is 1.414 amp. Its r.m.s value is

A. 1.414A

B. 0.707A

C. 1A

D. None of these

Answer: C



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27. In a balanced Wheatstone's network the galvanometer is replaced by another of lower resistance , then the network is

A. Balanced

B. May or may not be balanced

C. Not balanced

D. None of these

Answer: A



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28. The insertion of a new metal into a thermocouple

- A. Increases the thermo-emf
- B. Does not alter the thermo-emf
- C. Decreases the thermo-emf
- D. Reverses the direction on the thermo-emf

Answer: B



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29. The resistance of a thermistor varies with temperature according to the relation

A. $R = ae^{bT}$

B. $R = ae^{b/T^2}$

C. $R = ae^{b/T}$

D. $R = R = ae^{b/\sqrt{T}}$

Answer: C



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30. A.T.G. gives a deflection of 30° for a certain current at one place and a deflection of 45° at another place . The values of the horizontal component of the earth's fields at the two places and in the ratio of

A. $1 : \sqrt{3}$

B. $\sqrt{3} : \sqrt{2}$

C. $2 : \sqrt{3}$

D. $\sqrt{3} : 1$

Answer: D





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31. A transformer is used to

- A. Increase A C voltages only
- B. Decreased AC voltages only
- C. Either (a) or (b)
- D. Increase or decrease DC voltages

Answer: C



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32. The surface density of charges is maximum

A. At the curved surface

B. At a plane surface

C. At a pointed end

D. In none of these

Answer: C



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33. Dip at the poles is

A. zero

B. 60°

C. 90°

D. 45°

Answer: C



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34. The moment of the couple acting on a bar magnet of moment 0.2 Am^2 inclined at an angle 30° to the direction of field 5 tesla is

A. 0.5 Nm

B. $5 \times 10^{-3} \text{ Nm}$

C. 0.05 Nm

D. 10 Nm

Answer: A



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35.4×10^{-4} joules of work is done in moving a charge of 5 microcoulomb from a point A to another point B.

Then the potential difference between A and B is

- A. 80 volts
- B. 800 volts
- C. 8 volts
- D. 0.8 volts

Answer: A



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36. What is the resolving power of an instrument?

- A. The limit of resolution
- B. Square of the limit of resolution
- C. The reciprocal of the limit of resolution
- D. Square root of the limit of resolution

Answer: C



37. Interference of light can be explained by assuming light waves to be

- A. Only transverse waves
- B. Only longitudinal waves
- C. Stationary waves
- D. Either (a) or (b)

Answer: D



38. A thin prism of refracting angle 5° deviates the red and blue rays by 9.9° and 10.1° . The dispersive power of the material is

A. 0.2

B. 0.01

C. 0.02

D. 0.1

Answer: C



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39. The intensity of illumination at a distances of 5 m from a 200 candela source is

A. 10 lux

B. 8 lux

C. 24 lux

D. 4 lux

Answer: B



40. The relation between the refractive index and the critical angle of a medium is

A. $\mu = \cos C$

B. $\mu = \sec C$

C. $\mu = \cot C$

D. $\mu = \sin C$

Answer: B



41. The majority charge carriers in P -type semiconductor are

A. Positrons

B. Protons

C. Electrons

D. Holes

Answer: D



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42. A radioactive substance of mass 8 mg reduces to 1 mg after

A. 1 half-lives

B. 5 half-lives

C. 3 half-lives

D. 7 half-lives

Answer: C



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43. The energy liberated by the annihilation of the mass of 1 micro gram is

A. $9 \times 10^{-7} J$

B. $9 \times 10^7 J$

C. $9 \times 10^{10} J$

D. $9 \times 10^{20} J$

Answer: B



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44. A photon will have greater energy if it has greater

A. Wavelength

B. Amplitude

C. Frequency

D. Velocity

Answer: C



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45. Calculate the number of neutrons present in ${}_{92}\text{U}^{235}$ isotope.

A. 92

B. 143

C. 235

D. 327

Answer: B



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46. The electric field due to a proton of charge $1.6 \times 10^{-19} C$ at a distance 1 A ($10^{-10} m$) from it is

A. $14.4 \times 10^{10} N/C$

B. $6.4 \times 10^{10} N/C$

C. $4 \times 10^{10} N/C$

D. $8 \times 10^{10} N/C$

Answer: A



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47. The core of electromagnet is

A. Cobalt steel

B. Alnico

C. Soft iron

D. Copper

Answer: C



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48. The effective capacitance of two capacitors connected in series is

A. $C_1 + C_2$

B. $\frac{C_1 C_2}{C_1 + C_2}$

C. $C_1 - C_2$

D. $\frac{C_1 + C_2}{C_1 C_2}$

Answer: B



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49. The SI unit of resistivity is

A. $\text{ohm} \cdot \text{m}^3$

B. $\text{ohm} \cdot \text{m}$

C. $\text{ohm} \cdot \text{m}^2$

D. $\text{ohm} \cdot \text{m}^{-1}$

Answer: B



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50. Two positive point charges Q and $4Q$ are separated by a distance of 12 cm and from each other. The distance of the neutral point from Q is

A. 12 cm

B. 6 cm

C. 8 cm

D. 4 cm

Answer: D



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51. The R.M.S. value of the voltage in an A.C. circuit is 220 V. Its peak value is

A. $220\sqrt{2}$

B. $220\sqrt{2}$

C. $2\sqrt{220}$

D. $\sqrt{2} / 220$

Answer: A



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52. The reverse magnetising field required to wipe out residual magnetism is called

A. Hysteresis

B. Retentivity

C. Coercivity

D. Permeability

Answer: C



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53. In a uniform magnetic field the frequency of vibration of a magnetic is given by

A. $2\pi\sqrt{I / MB}$

B. $1 / 2\pi\sqrt{MB / I}$

C. $1 / 2\pi\sqrt{I / MB}$

D. $2\pi\sqrt{MB / I}$

Answer: B



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54. The ratio of magnetic field due to a given short bar magnet in tan A and tan B position for the same distance is

A. 2:1

B. 1:4

C. 1:2

D. 4:11

Answer: A



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55. Emission of electrons from a metal surface due to incident radiation is called

- A. Thermionic emission
- B. Photo conductivity
- C. Photoelectric emission
- D. Seebeck effect

Answer: C



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56. 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. 0.04

C. 0.03

D. 0.05

Answer: B



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57. A glass prism is immersed in water. A ray of light passing through it,

- A. Bends away from the base
- B. Does not bend
- C. Bends towards the base
- D. Always gets totally reflected

Answer: C



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58. Double refraction may be observed in the following substance

A. Water

B. Crown glass

C. Flint glass

D. Calcite

Answer: D



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59. If in a convex lens object and its image distances are each equal to d , the focal length of the lens is

A. $2d$

B. $d/2$

C. d

D. $d/4$

Answer: B



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60. Formation of mirages is due to

A. Interference

B. Refraction

C. Total internal reflection

D. Dispersion

Answer: C



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