PHYSICS

BOOKS - KCET PREVIOUS YEAR PAPERS

MODEL TEST PAPER 9

Physics

1. The specific resistance of a wire of length 1m, area of cross-section $0.5m^2$, is 25 micro-ohm meter. The resistance of the wire is

A. 2×10^{-6} ohms

B. 3×10^{-6} ohms

C. 6×10^{-5} ohms

D. 5×10^{-5} ohms

Answer: D

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2. The resistance of a conductor is

A. Directly proportional to area of cross-section

B. Directly proportional to length of conductor

C. Inversely proportional to length of conductor

D. Inversely proportional to temperature of conductor

Answer: B

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3. The pd across a resistance of 1 ohm is 1 volt, then the current is

A. 1 amp

B. 10 amp

C. 10 emu

D. 1 emu

Answer: A

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4. The resistance of an ideal voltmeter is

A. Very high

B. Very low

C. Nearly zero

D. None of the above

Answer: D

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5. A galvaometer is converted into a ammeter using a

A. High resistance in series

B. Low resistance in parallel

C. High resistance in parallel

D. Low resistance in series

Answer: B

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6. The sensitivity of moving coil galvanometer can be increased by using

A. A thicker supension

B. A thinner suspension

C. Both (a) & (b)

D. None of the above

Answer: B

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7. The direction of motion of a conductor carrying current due to effect of magnetic field is given by

A. Fleming's left hand rule

B. Laplace rule

C. Fleming's right hand rule

D. Hertber's law

Answer: A

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8. If the tension in a string is increased by 21 percent, the fundamental frequency of the string changes by $15Hz$. Which of the following statements will also be correct?

A. The original fundamental frequency is nearly 150 Hz.

B. The velocity of propagation changes by 50%

C. The velocity of propagation changes by 4.5%

D. The fundamental wavelength changes nearly by 10%

Answer: A

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9. A wave is represented by the equation

$$y = A\sin\left(10\pi x + 15\pi t + \frac{\pi}{3}\right)$$

where x is in meter and t is in seconds. The expression represents :

A. A wave travelling in the negative x-direction with a velocity 1.5 m/s

B. A wave-travelling in the negative x -direction having a wavelength 2m

C. Both (a) & (b)

D. Neither (a) or (b)

Answer: C

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10. The velocity of light emitted by a source S observed by an observer O , who is at rest with respect to S is c . If the observer moves towards S with velocity v , the velocity of light as observed will be

A. C+ v

B. C

C. C - v

D. none

Answer: B

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11. A wire of length one metre under a certain initial tension emits a sound of fundamental frequency 256 Hz. When the tesnion is increased by 1 kg wt , the frequency of the fundamental node increases to 320 Hz. The initial tension is

A. $16/9$

B. $3/4$

C. $4/3$

D. None of these

Answer: A

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12. Two adjacent piano keys are struck simultaneously. The notes emitted by them have frequencies n_1 and n_2 . The number of beats heard per second is

A. $2(f_1 - f_2)$

B. $0.5(f_1 - f_2)$

C. $(3/2)(f_2 - f_2)$

D. $(f_1 - f_2)$

Answer: D

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13. The equation of a waves is $y = \sin(2\pi rt/\lambda)$. When it is reflected to at a rigid support its amplitude reduces by 10%. The equation of the replaced wave

A. $y = 0.9A \sin(2\pi rt/\lambda)$

B. $y = 0.9A \sin\{(2\pi rt/\lambda) + \pi)$

C. $y = 1.1A \sin(2\pi rt/\lambda)$

D. $y = A \sin((2\pi rt/\lambda) + \pi)$

Answer: B

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14. If g is the acceleration due to gravity on the earth's surface, the gain in the potential energy of an object of mass m raised from the

surface of the earth to a height equal to the radius R of the earth, is

A. Mg R

B. 2 Mg R

C. $MgR/2$

D. MG R/4

Answer: C

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15. A car accelerates from rest at a constant rate for some time after which it decelerates at a constant rate β to come to rest. If the total time elapsed is t, the maximum velocity acquired by the car is given by :

A. $\frac{\alpha\beta t}{\alpha+\beta}$

B. $\frac{(\alpha^2+\beta^2)t}{\alpha\beta}$

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

D. $\frac{(\alpha^2-\beta^2)t}{\alpha\beta}$

Answer: A

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16. A stone falls freely from rest and the total distance covered by it in last second of its motion equals the distance covered by it in the first 3s of its motion. How long the stone will remain in the air?

A. 6 sec

B. 5 sec

C. 10 sec

D. 4 sec

Answer: B

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17. A car of mass 1000 kg is negotiating an unbanked curve of radius 20 m. If the coefficient of friction is 0.5 and $g = 10m/s^2$ the maximum safe speed of the car is

A. $5ms^{-1}$

B. $20ms^{-1}$

C. $10ms^{-1}$

D. $15ms^{-1}$

Answer: C

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18. The density of the earth is approximately

A. $\frac{4\pi g}{3rG}$

B. $\frac{gr^2}{4\pi G}$

C. $\frac{3g}{4\pi rG}$

D. $\frac{4\pi g}{Gr}$

Answer: C

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19. The displacement of a particle is given by $x = (t-2)^2$ where x is in meters and in seconds. The distance covered by the particle in first 4 seconds is :

A. 6

B. $3\sqrt{2}$

C. 3

D. $3\sqrt{3}$

Answer: C

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20. A motor boat , whose speed is 15 km /hr in still water goes 30 km down stream and comes

in a total of 4 hours 30 minutes . Determine the speed of the stream

A. 12

B. $60\sqrt{7}$

C. 15

D. 20

Answer: A

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21. The binding energy per nucleon curve is sharp for helium. This shows that helium is

A. Radioactive

B. Stable

C. Fissionable

D. Unstable

Answer: B

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22. If the mass of a radioactive sample is doubled, the activity of the sample

A. Is doubled

B. Remains the same

C. Is reduced to half

D. Increases four times

Answer: B

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23. The 4n series starts from thorium-232 and ends at :

A. First

B. Third

C. Second

D. Fourth

Answer: C

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24. In a Copper-Iron thermocouple the thermoelectric current flows from

A. Copper to iron at cold junction

B. Iron to copper at hot junction

C. Iron to copper at cold junction

D. None of these

Answer: C

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25. In an electrical circuit carrying an A.C., an moving coil galvanometer cannot be used because

A. The net magnetic field is too high

B. There is too much energy loss

C. The net magnetic field is zero

D. None of these

Answer: D

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26. An example of a non ohmic device is

A. Copper wire

B. Tangent galvanometer

C. Platinum resistance thermometer

D. Transistor

Answer: D

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27. What is the nature of force between two parallel wires carrying current in same direction?

A. Attract each other

B. Do not attract or repel

C. Repel each other

D. Oscillate

Answer: A

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28. A current of 2 ampere passes through a wire for 8 seconds. Number of electrons passing across the wire is (electronic charge 1.6×10^{-19} coulomb)

A. 3.2×10^{20}

B. 1×10^{20}

C. 3.2×10^{18}

D. 1×10^{18}

Answer: B

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29. Two spherical droplets have equal surface density of charge. They combine to form a single droplet. The surface density of charge

A. Increases

B. Edit Decreases

C. Remains the same

D. None of these

Answer: A

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30. The electric field at a point, distant r from a charge q is E. The potential at that point is

A. Er^2

B. $\frac{E}{r^2}$

C. Er

D. $\frac{E}{r}$

Answer: C

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31. A voltmeter reads 4 V when connected to a parallel plate capacitor with air as a dielectric. When a dielectric slab is introduced between plates for the same configuration , voltmeter reads 2V. What is the dielectric constant of the material ?

A. Increases

B. Remains the same

C. Decreases

D. Becomes infinte

Answer: C

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32. Which of the following has magnesium?

A. Coblat steel

B. Alnico

C. Permalloy

D. Stainless steel

Answer: C

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33. The value of horizontal component of the earth's field, at a place where the dip is 45° and total field 3.4×10^{-5} tesla is

A. $2.404 \times 10^{-5} T$

B. $0.2404 \times 10^{-5} T$

C. $24.04 \times 10^{-5} T$

D. $0.02404 \times 10^{-5} T$

Answer: A

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34. A bar magnet is cut perpendicular to its axis into two equal halves. Its magnetic moment is

A. Halved

B. Quadrupled

C. Doubled

D. The same

Answer: A

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35. The ratio in which x -axis divides the line segment joining (3,6) and (12,-3) is

A. Passing through centre of gravity

B. Which shows direction along which there is no double refraction

C. Normal to the surface

D. Perpendicular to extraordinary ray

Answer: B

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36. The distance between any two successive dark bands is given by

A. $\frac{D\lambda}{d}$

B. $\frac{\lambda}{2D}$

C. $\frac{d}{\lambda D}$

D. $2d\lambda$

Answer: A

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37. A lamp of 40 cd is used to illuminate a point vertically below it at a distance of 0.5 m. To have the same illumination at that point, distance of 10 cd lamp above the point should be

A. $\frac{20}{3}$ lux

B. 20 lux

C. $\frac{3}{20}$ lux

D. 80 lux

Answer: A

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38. A convex lens of focal length 16 cm forms a virtual image of double the size of the object. What is the distance of the object from the lens ?

A. $0.25m$

B. $0.2m$

C. $0.05m$

D. $0.5m$

Answer: C

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39. A ray of light passing from glass to water is incident on the glass-water interface at 65°. If the critical angle for the pair of media is 63°.

A. Red

B. Green

C. Blue

D. Violet

Answer: D

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40. If v_1 and v_2 are the velocities of light in the two media having angles of incidence and refraction i_1 and i_2 respectively, then

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

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

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

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

Answer: A

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41. Beta particles before emission from a radioactive element

A. Exist outside the atom

B. Exist in the nucleus

C. Are nothing but the electrons of the atom

D. Are just created inside the nucleus at the instant of emission

Answer: D

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42. The energy equivalent of 5.5×10^{-4} amu in MeV is

A. 0.51 MeV

B. 0.051 MeV

C. 5.1 MeV

D. 0.0051 MeV

Answer: A

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43. In case of an artificial radiactive transformation as given by $._{15}P^{30} \rightarrow ._{14}Si^{30} + X$, the emitted particle X is

A. Neutron

B. Electron

C. Proton

D. Positron

Answer: D

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44. The angular momentum of the electron in the second Bohr orbit is

A. h

B. $\frac{h}{2\pi}$

C. $\frac{h}{4\pi}$

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

Answer: D

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45. The radius of a nucleus of a mass number A is directly proportional to.

A. $A^{1/2}$

B. $A^{1/3}$

C. $A^{2/3}$

D. A^{2}

Answer: B

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46. As the temperature of hot junction increases, the thermo emf :

A. Parabola

B. Circle

C. Expotential

D. Straight line

Answer: D

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47. The potential difference across the terminals of a cell of emf 1.1 Volt becomes 1 volt when an external resistance of 1Ω is connected to its terminals. Its internal resistance is

A. 1Ω

B. 0.1Ω

C. 10Ω

D. 1.1Ω

Answer: B

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48. When 'n' number of identical cells, each of emf E and internal resistance r are grouped in series, the current flowing through an external resistance R is given by

A. $\frac{nE}{nR+r}$

B. $\frac{nE}{R+nr}$

C. $\frac{E}{nR+r}$

D. $\frac{E}{R+r}$

Answer: B

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49. The current in c coil of self - inductance 10 mH changes from 0 to 1.5 amp in 1 milli-sec. The emf induced in the coil is

A. $15V$

B. $5V$

C. $1.5V$

D. $150V$

Answer: B

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50. Electric intensity is equal to :

A. Same as that on its surface

B. Zero

C. Greater than that on its surface

D. Less than that on its surface but not zero

Answer: B

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51. Two capacitors each of capacitance 2μ f are connected in series. A third capacitor of capacitance $3\mu f$ is connected in parallel to this combination. The effective capacitance is

A. $1\mu f$

B. $7\mu f$

C. $5\mu f$

D. $4\mu f$

Answer: D

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52. The potential difference between two points separated by 1 mm in an electric field is 300 mV. The electric intensity (in V/m) is

A. 300

B. $\frac{1}{300}$

C. 3×10^{-4}

D. $\frac{1}{3}$

Answer: A

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53. If we place a bar magnet in the magnetic meridian with its north pole towards geographic north, the neutral point will be :

A. On the axial line

B. On the line inclinded at 45° to the meridian

C. On the equatorial line

D. At any point

Answer: C

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54. The period of oscillation of a magnet is T in earth's magnetic field. When another identical

magnetic is kept over it with their like poles together, the new period of oscillation is

A. 2 T

B. T

C. $\sqrt{2T}$

D. $\frac{T}{\sqrt{2}}$

Answer: A

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55. The needle in the dip circle stands vertical when the plane of the circle is

A. Along the earth's magnetic meridian

B. Inclined at 45° to earth's magnetic meridian

C. Perpendicular to earth's magnetic meridian

D. None of these

Answer: C

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56. The specific rotation of an optically active substance of length L_m and concentration C kg/m^3 with angle of rotation θ is given by

A. $\frac{LC}{\theta}$

B. $\frac{\theta}{LC}$

C. θLC

D. $\frac{1}{\theta LC}$

Answer: B

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57. In the diffraction pattern due to single slit of width 'a' with incident light of wavelength λ with angle of diffraction θ, the condition for the first minimum is

A. $\lambda \sin\theta = a$

B. $a \sin\theta = \lambda$

C. $a \cos\theta = \gamma$

D. $\lambda \cos\theta = a$

Answer: B

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58. Time of exposure for a photographic print is 10 s, when a lamp of 50 cd is placed at 1 m from it. Then another lamp of luminous intensity I is used, and is kept at 2 m from it. If the time of exposure now is 20 sec, the value of I is (cd)

A. Directly proportional to the intensity of illumination

B. Independent of intesntiy of illumination

C. Inversely proprtional to the intensity of illumination

D. Proportional to the square root of the intensity of illumination

Answer: C

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59. Two lenses of powers + 1.5 D and - 1 D are kept in contact. The focal length of the combination is

A. $0.2m$

B. $0.5m$

C. $0.02m$

D. 2m

Answer: D

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60. The angle of incidence on one face of an equilateral prism is 40° and the angle of emergance is 70°. The corresponding angle of deviation

A. 50°

B. 60°

C. 38°

D. 55°

Answer: A

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