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| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | A car moving with a velocity of 20ms-1 is stopped in a distance of 40m. If the same car is travelling at double the velocity, the distance travelled by it for the same retardation is |
| ((OPTION\_A)) | 640 |
| ((OPTION\_B)) | 420 |
| ((OPTION\_C)) | 1080 |
| ((OPTION\_D)) | 160 |
| ((CORRECT\_CHOICE)) (A/B/C/D) | D |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | An electric dipole is kept in a nonuniform electric field. it generally experiences |
| ((OPTION\_A)) | A force but not a torque |
| ((OPTION\_B)) | A force and torque |
| ((OPTION\_C)) | Neither a force nor a torque |
| ((OPTION\_D)) | A torque but not a force |
| ((CORRECT\_CHOICE)) (A/B/C/D) | B |
| ((EXPLANATION)) (OPTIONAL) |  |

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| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | In the series LCR circuit the peak voltages across C, L and R are 30V, 110V and 60V respectively. The rms value of the applied voltage is |
| ((OPTION\_A)) | 141V |
| ((OPTION\_B)) | 70.7V |
| ((OPTION\_C)) | 200V |
| ((OPTION\_D)) | 100V |
| ((CORRECT\_CHOICE)) (A/B/C/D) | B |
| (EXPLANATION)) (OPTIONAL) |  |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | A mass of 1kg carrying a charge of 2C is accelerated through a potential of 1V. The velocity required by it is |
| ((OPTION\_A)) | √2 ms-1 |
| ((OPTION\_B)) | 2 ms-1 |
| ((OPTION\_C)) | 1/√2 ms-1 |
| ((OPTION\_D)) | 1/2 ms-1 |
| ((CORRECT\_CHOICE)) (A/B/C/D) | B |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | Ohm’s law is applicable to |
| ((OPTION\_A)) | Diode |
| ((OPTION\_B)) | Transistor |
| ((OPTION\_C)) | Electrolyte |
| ((OPTION\_D)) | Conductors |
| ((CORRECT\_CHOICE)) (A/B/C/D) | D |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | Which of the following semiconducting devices is used as a voltage regulator? |
| ((OPTION\_A)) | Photodiode |
| ((OPTION\_B)) | Laser diode |
| ((OPTION\_C)) | Zener diode |
| ((OPTION\_D)) | Solar cell |
| ((CORRECT\_CHOICE)) (A/B/C/D) | C |
| ((EXPLANATION)) (OPTIONAL) |  |

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| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | Which of the following is piezoelectric material |
| ((OPTION\_A)) | Rubber |
| ((OPTION\_B)) | Plastic |
| ((OPTION\_C)) | Lead |
| ((OPTION\_D)) | Quartz |
| ((CORRECT\_CHOICE)) (A/B/C/D) | D |
| ((EXPLANATION)) (OPTIONAL) |  |

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| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | During inelastic collision between two objects, which of the following quantity always remain conserved? |
| ((OPTION\_A)) | Total mechanical energy |
| ((OPTION\_B)) | Speed of each body |
| ((OPTION\_C)) | Total kinetic energy |
| ((OPTION\_D)) | Total linear momentum |
| ((CORRECT\_CHOICE)) (A/B/C/D) | D |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | An infinitely long thin straight wire has charge density of 1/4x10^-2 cm-1. What is the magnitude of electric field at a distance 20cm from the axis of the wire? |
| ((OPTION\_A)) | 9x10^8 NC-1 |
| ((OPTION\_B)) | 1.12x10^8 NC-1 |
| ((OPTION\_C)) | 4.5x10^8 NC-1 |
| ((OPTION\_D)) | 2.25x10^8 NC-1 |
| ((CORRECT\_CHOICE)) (A/B/C/D) | D |
| ((EXPLANATION)) (OPTIONAL) |  |

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| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | In a system of two crossed polarizers, it is found that the intensity of light from the second polarizer is half from that of the first polarizer. The angle between their pass axes is |
| ((OPTION\_A)) | 45֯ |
| ((OPTION\_B)) | 60֯ |
| ((OPTION\_C)) | 30֯ |
| ((OPTION\_D)) | 0֯ |
| ((CORRECT\_CHOICE)) (A/B/C/D) | A |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | Which one of the following relation is correct for current density? |
| ((OPTION\_A)) | J = neavd |
| ((OPTION\_B)) | J = nEa/vd |
| ((OPTION\_C)) | J = nevd |
| ((OPTION\_D)) | J = 1/nevd |
| ((CORRECT\_CHOICE)) (A/B/C/D) | C |
| ((EXPLANATION)) (OPTIONAL) |  |

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| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | First overtone frequency of a closed pipe of length L1 is equal to the second harmonic frequency of an open pipe of length L2. The ratio L1/L2 |
| ((OPTION\_A)) | 3/4 |
| ((OPTION\_B)) | 4/3 |
| ((OPTION\_C)) | 3/2 |
| ((OPTION\_D)) | 2/3 |
| ((CORRECT\_CHOICE)) (A/B/C/D) | A |
| ((EXPLANATION)) (OPTIONAL) |  |

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| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | The increase in resistance of a metal with temperature is due to |
| ((OPTION\_A)) | Increase in energy of free electron |
| ((OPTION\_B)) | Decrease in the electric field experienced by the free electron |
| ((OPTION\_C)) | Increase in the amplitude of vibration of the lattice atom in the metal |
| ((OPTION\_D)) | none of these |
| ((CORRECT\_CHOICE)) (A/B/C/D) | C |
| ((EXPLANATION)) (OPTIONAL) |  |

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| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | The phenomenon involved in the reflection of radio waves by ionosphere is similar to |
| ((OPTION\_A)) | Total internal reflection of light in the air during a mirage |
| ((OPTION\_B)) | Scattering of light by air particles |
| ((OPTION\_C)) | Reflection of light by plane mirror |
| ((OPTION\_D)) | Dispersion of light by water molecules during the formation of rainbow |
| ((CORRECT\_CHOICE)) (A/B/C/D) | A |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | In the three parts of the transistor, emitter is of |
| ((OPTION\_A)) | Highly doped |
| ((OPTION\_B)) | Lightly doped |
| ((OPTION\_C)) | Large size |
| ((OPTION\_D)) | Moderately doped |
| ((CORRECT\_CHOICE)) (A/B/C/D) | A |
| ((EXPLANATION)) (OPTIONAL) |  |

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| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | A tray of mass 12kg is supported by two identical springs. When the tray is pressed down slightly and then released; it executes SHM with a time period of 1.5s. The spring constant of each spring is |
| ((OPTION\_A)) | Infinity |
| ((OPTION\_B)) | 50 Nm-1 |
| ((OPTION\_C)) | Zero |
| ((OPTION\_D)) | 105 Nm-1 |
| ((CORRECT\_CHOICE)) (A/B/C/D) | D |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | Pressure of an ideal gas is increased by keeping the temperature constant. The kinetic energy of molecule |
| ((OPTION\_A)) | Decreases |
| ((OPTION\_B)) | Increases |
| ((OPTION\_C)) | Remain the same |
| ((OPTION\_D)) | Increases or decreases depending on the nature of gas |
| ((CORRECT\_CHOICE)) (A/B/C/D) | C |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | An inductor of inductance L and resistance R are joined together in series and connected by a source of frequency ω. The power dissipated in the circuit is |
| ((OPTION\_A)) | V^2 R/(R^2 +ω^2 L^2) |
| ((OPTION\_B)) | V^2 R/√(R^2 + ω^2 L^2) |
| ((OPTION\_C)) | (R^2 +ω^2 L^2)/V |
| ((OPTION\_D)) | V/(R^2 + ω^2 L^2) |
| ((CORRECT\_CHOICE)) (A/B/C/D) | A |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | A certain charge 2Q is divided at first into two parts q1 &q2. Later the charges are placed at a certain distance. If the force of interaction between two charges is maximum then Q/q1 |
| ((OPTION\_A)) | 2 |
| ((OPTION\_B)) | 0.5 |
| ((OPTION\_C)) | 4 |
| ((OPTION\_D)) | 1 |
| ((CORRECT\_CHOICE)) (A/B/C/D) | D |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | Kirchhoff’s junction rule is reflection of |
| ((OPTION\_A)) | Conservation of energy |
| ((OPTION\_B)) | Conservation of charges |
| ((OPTION\_C)) | Conservation of current density vector |
| ((OPTION\_D)) | Conservation of momentum |
| ((CORRECT\_CHOICE)) (A/B/C/D) | B |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | A magnetic needle has a magnetic moment of 5x10^-2Am2 and moment of inertia 8X10^-6kgm2. It has a period of oscillation of 2s in a magnetic field B. The magnitude of the magnetic field is approximately |
| ((OPTION\_A)) | 0.4X10^-4T |
| ((OPTION\_B)) | 0.8X10^-4T |
| ((OPTION\_C)) | 1.6X10^-4T |
| ((OPTION\_D)) | 3.2X10^-4T |
| ((CORRECT\_CHOICE)) (A/B/C/D) | C |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | A positive hole in a semiconductor is |
| ((OPTION\_A)) | An artificially created particles |
| ((OPTION\_B)) | An anti-particle of electron |
| ((OPTION\_C)) | A vacancy created when an electron leaves a covalent bond |
| ((OPTION\_D)) | Absence of free electrons |
| ((CORRECT\_CHOICE)) (A/B/C/D) | C |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | Heated perfect black body is expected to emit radiations |
| ((OPTION\_A)) | Of only short wavelength |
| ((OPTION\_B)) | Of only longer wavelength |
| ((OPTION\_C)) | On only the visible range |
| ((OPTION\_D)) | Of all wavelengths |
| ((CORRECT\_CHOICE)) (A/B/C/D) | D |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | In Rutherford experiment, for a head on collision of ɑ particles with a gold nucleus, the impact parameter is |
| ((OPTION\_A)) | Of the order of 10^-14m |
| ((OPTION\_B)) | Of the order of 10^-6m |
| ((OPTION\_C)) | Zero |
| ((OPTION\_D)) | Of the order of 10^-10m |
| ((CORRECT\_CHOICE)) (A/B/C/D) | C |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | According to experimental observations, the dependence of electrical conductivity on the temperature is |
| ((OPTION\_A)) | σ ɑ T |
| ((OPTION\_B)) | σ ɑ √T |
| ((OPTION\_C)) | σ ɑ 1/T |
| ((OPTION\_D)) | σ ɑ 1/√T |
| ((CORRECT\_CHOICE)) (A/B/C/D) | C |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | If two point charges of opposite sign +q and –q are separated by a distance L, the electric dipole moment is |
| ((OPTION\_A)) | q/L |
| ((OPTION\_B)) | q/L2 |
| ((OPTION\_C)) | [(+q)(-q)]/L^2 |
| ((OPTION\_D)) | qL |
| ((CORRECT\_CHOICE)) (A/B/C/D) | D |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | In a dielectric material, the polarization is |
| ((OPTION\_A)) | Linear function of applied field |
| ((OPTION\_B)) | Square function of applied field |
| ((OPTION\_C)) | Exponential function of applied field |
| ((OPTION\_D)) | Logarithmic function of applied field |
| ((CORRECT\_CHOICE)) (A/B/C/D) | A |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | Einstein’s theory of photoelectric effect establishes |
| ((OPTION\_A)) | Wave nature of light |
| ((OPTION\_B)) | Particle nature of light |
| ((OPTION\_C)) | Wave nature of electron |
| ((OPTION\_D)) | Particle nature of electron |
| ((CORRECT\_CHOICE)) (A/B/C/D) | B |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | Two metal plates are separated by 2cm. The potentials of the plates are -10V and +30V. The electric field between the two plates |
| ((OPTION\_A)) | 1000V/M |
| ((OPTION\_B)) | 3000V/m |
| ((OPTION\_C)) | 700V/m |
| ((OPTION\_D)) | 2000V/m |
| ((CORRECT\_CHOICE)) (A/B/C/D) | D |
| ((EXPLANATION)) (OPTIONAL) |  |

|  |  |
| --- | --- |
| ((MARKS)) (1/2/3...) | 1 |
| ((QUESTION)) | An object is placed at the principal focus of a convex mirror. The image will be at |
| ((OPTION\_A)) | Center of curvature |
| ((OPTION\_B)) | Principal focus |
| ((OPTION\_C)) | Infinity |
| ((OPTION\_D)) | No image will be formed |
| ((CORRECT\_CHOICE)) (A/B/C/D) | D |
| ((EXPLANATION)) (OPTIONAL) |  |