SUCCESS KEY TEST SERIES

Annual Examination

Std: 11th Science	**Subject: Physics**	Time: 3 Hours
Date :	**Sample Question Paper**	Max Marks: 70

Section A (MCQ & VSA 1 MARKS Questions)

Q.1   Select and write the correct answer: **10**

(i) The time period of oscillation of a simple pendulum is given by _____.
(a) $T = \pi\sqrt{l/g}$.   (b) $T = 2\pi\sqrt{l/g}$.   (c) $T = \alpha\sqrt{l/g}$.   (d) $T = 2\alpha\sqrt{l/g}$.

(ii) Calculus was first developed by _____.
(a) Sir G.W.Leibritz and Sir Ramanujan.
(b) Sir Robert Hooke and Sir Ramanujan.
(c) Sir Issac Newton and Sir Robert Hooke.
(d) Sir G.W.Leibritz and Sir Issac Newton.

(iii) The motion of an object around a circular path is known as
(a) Rectilinear motion   (b) Random motion
(c) Circular motion   (d) Linear motion

(iv) For a particle having a uniform circular motion, which of the following is constant
(a) Speed   (b) Acceleration   (c) Velocity   (d) Displacement

(v) Identify the correct statement.
(a) Centre of mass is a fixed property for a given rigid body irrespective of its orientation.
(b) Centre of gravity depends on the orientation of the body.
(c) For uniform gravitational fields, centre of gravity coincides with the centre of mass.
(d) All of these.

(vi) The total energy of a circularly orbiting satellite is
(a) Positive   (b) Negative   (c) Zero   (d) Infinite

(vii) Which of the following is incorrect for deformation?
(a) Deformation can be in the form of change in length of the body.
(b) Deformation can be in the form of change in volume of the body.
(c) Deformation can be in the form of change in shape of the body.
(d) Deformation can be in the form of change in velocity of the body.

(viii) Wave associated with a moving object is called
(a) Matter wave   (b) Mechanical wave   (c) EM wave (d) Stationary wave

(ix) A thin pencil of length 30 cm is kept along the principal axis of a concave mirror of curvature 40 cm. Nearest end of the pencil is 30 cm from the pole of the mirror. What will be the size of the image of the pencil?
(a) 30 cm   (b) 24 cm   (c) 26 cm   (d) 28 cm

(x) Gap between two electrodes is 3.6 mm and magnitude of electric field between the electrodes is 1.8×10^3 V/m. Find the potential applied across the gap
(a) 6.9 V   (b) 6.7 V   (c) 6.48 V   (d) 7.2 V

Q.2   Answer the following: **8**

(i) What is the velocity vector of a stationary particle?

(ii) An object moves from x = 5 m to x = 10 m in 5 s. What is velocity of the object?

(iii) What is the principle of conservation of linear momentum?

(iv) What happens when two bodies of equal masses undergo elastic head on collision?

(v) What happens to the weight of a body in a lift which has a net upward acceleration?

(vi) Define the term 'triple point'.

(vii) What is meant by pitch of sound?

(viii) What is resistivity of a conductor?

Section B (SA I - 2 MARKS EACH)

Attempt any Eight: **16**

Q.3 If ten students are asked to measure the length of a piece of cloth up to a mm, using a meter scale, do you think their answers will be identical? Give reasons.

Q.4 Given $\vec{a} = \hat{i} + 2\hat{j}$ and $\vec{b} = 2\hat{i} + \hat{j}$, what are the magnitudes of the two vectors?

Are these two vectors equal?

Q.5 A car moving along a straight road with a speed of 120 km/hr, is brought to rest by applying brakes. The car covers a distance of 100 m before it stops. Calculate (i) the average retardation of the car (ii) time taken by the car to come to rest.

Q.6 What is the variation in acceleration due to gravity with altitude?

Q.7 A block of mass 37 kg rests on a rough horizontal plane having coefficient of static friction 0.3. Find out the least force required to just move the block horizontally.

Q.8 A man standing between 2 parallel cliffs fires a gun. He hears two echoes one after 3 seconds and other after 5 seconds. The separation between the two cliffs is 1360 m, what is the speed of sound?

Q.9 At which positions of the objects do spherical mirrors produces (i) diminished image, (ii) magnified image?

Q.10 A charge +q exerts a force of magnitude -0.2 N on another change -2q. If they are separated by 25.0 cm, determine the value of q.

Q.11 A 6 m long wire has diameter 0.5 mm. Its resistance is 50 Ω. Find the resistivity and conductivity.

Q.12 What happens if a bar magnet is cut into two pieces transverse to its length/ along its length?

Q.13 The magnetic field of an EM wave travelling along x-axis is $\vec{B} = \hat{k}[4 \times 10^{-4} \sin(\omega t - kx).]$ Here B is in tesla, t is second and x is in m. Calculate the peak value of electric force acting on a particle of charge 5 μC travelling with a velocity of 5×10^5 m/s along the y-axis.

Q.14 Find the resistance between point A and B when an ideal diode is (I) forward biased and (2) reverse biased.
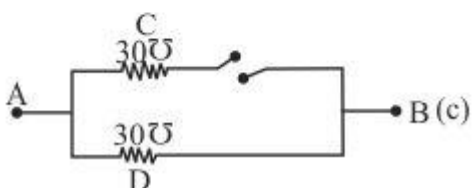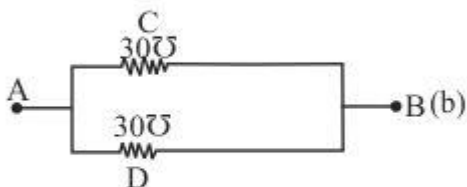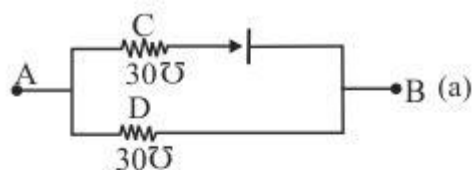
Section C (SA II - 3 MARKS EACH)

Attempt any Eight: 24

Q.15 Which of the following are scalars or vectors?
(i) displacements (ii) distance travelled (iii) velocity
(iv) speed   (v) force (vi) work done (vii) energy

Q.16 If the motion of an object is described by x = f(t) write formulae for instantaneous velocity and acceleration.

Q.17 Are there any situations in which we cannot apply Newton's laws of motion? Is there any alternative for it?

Q.18 What would be the average duration of year if the distance between the Sun and the Earth becomes
(A) thrice the present distance.
(B) twice the present distance.

Q.19 A body of mass 37 kg rests on a rough horizontal surface. The minimum horizontal force required to just start the motion is 68.5 N. In order to keep the body moving with constant velocity, a force of 43 N is needed. What is the value of   a) coefficient of static friction? and b) coefficient of kinetic friction?

Q.20 How heat transfer occurs through radiation in the absence of a medium?

Q.21 A thin aluminium plate has an area 286 cm² at 20°C. Find its area when it is heated to 180°C.
(β for aluminium = 4.9 x 10^{-5} /°C)

Q.22 Describe a transverse wave.

Q.23 A point object is kept 10 cm away from one of the surfaces of a thick double convex lens of refractive index 1.5 and radii of curvature 10 cm and 8 cm. Central thickness of the lens is 2 cm. Determine location of the final image considering paraxial rays only.

Q.24 Two resistors 1kΩ and 2k Ω are connected in parallel combination.
i] Find equivalent resistance of parallel combination
ii] When this parallel combination is connected to 9 V supply, by neglecting internal, resistance calculate current through each resistor.

Q.25 What are radio waves? Give its two uses.

Q.26 Why is the conductivity of a n-type semiconductor greater than that of p-type semiconductor even when both of these have same level of doping?

Section D (SA II - 4 MARKS EACH)

Attempt any Three: 12

Q.27 (i) Define: (a) percentage error (b) relative error

(ii) The diameter of a sphere is 2.14 cm. Calculate the volume of the sphere to the correct number of significant figures.

Q.28 A ball of mass 100 g dropped on the ground from 5 m bounces repeatedly. During every bounce 64% of the potential energy is converted into kinetic energy. Calculate the following :
(a) Coefficient of restitution.
(b) Speed with which the ball comes up from the ground after third bounce.
(c) Impulse given by the ball to the ground during this bounce.
(d) Average force exerted by the ground if impact lasts for 250 ms.
(e) Average pressure exerted by the ball on the ground during this impact if contact area of the ball is 0.5 cm².

Q.29 (i) Explain and define dispersive power of a transparent material. Obtain its expressions in terms of angles of deviation and refractive indices.

(ii) Focal length of the objective of an astronomical telescope is 1 m. Under normal adjustment, length of the telescope is 1.05 m. Calculate focal length of the eyepiece and magnifying power under normal adjustment.

Q.30   Why a small voltage can produce a reasonably large electric field?

Q.31   (i) What are the rules concentrating the lines of force?

(ii) Earth's magnetic field at the equator is approximately 4×10^{-5} T. Calculate Earth's dipole moment. (Radius of Earth = 6.4×10^{6} m, $\mu_0 = 4\pi \times 10^{-7}$ SI units)

-------- All the Best --------