Physics (Objective) (ALP) (New Course)

Marks: 12

GROUP – I

Time: 15 Minutes

Q1. The temperature which has the same value on Celsius and Fahrenheit scale is:
(A) −40 (B) +40 (C) −45 (D) +45
Correct answer: (A) −40
Explanation: At −40°, the Celsius and Fahrenheit readings are equal.

Q2. Magnetic lines of force:
(A) Enter into south pole (B) Cross one another (C) Enter into north pole (D) Are always directed in a straight line
Correct answer: (A) Enter into south pole
Explanation: Outside a magnet, field lines enter the south pole.

Q3. A hypothesis:
(A) May or may not be testable (B) Is supported by evidence **(C) Is a possible answer to a question** (D) All of these
Correct answer: (C) Is a possible answer to a question
Explanation: A hypothesis is a proposed answer or explanation to a question.

Q4. Example of contact force is:
(A) Gravitational force **(B) Normal force** (C) Electrostatic force (D) Magnetic force
Correct answer: (B) Normal force
Explanation: Normal force acts when two surfaces are in contact.

Q5. A paratrooper is in _____ equilibrium.
(A) Static **(B) Dynamic** (C) Neutral (D) Unstable
Correct answer: (B) Dynamic
Explanation: At terminal speed, forces balance while the paratrooper is moving.

Q6. The unit of pressure in S.I. is:
(A) Joule (B) Watt (C) Kilojoule **(D) Pascal (Pa)**
Correct answer: (D) Pascal (Pa)
Explanation: The SI unit of pressure is N/m^2, called the pascal.

Q7. Which one is a non-physical quantity?
(A) Distance (B) Density **(C) Colour** (D) Temperature
Correct answer: (C) Colour
Explanation: Distance, density and temperature are measurable physical quantities.

Q8. A ball is dropped from the top of a tower. The distance covered by it in the first second is:
(A) 5 m (B) 10 m (C) 50 m (D) 100 m
Correct answer: (A) 5 m
Explanation: $s = \frac{1}{2}gt^2 \approx \frac{1}{2} \times 10 \times 1^2 = 5$ m.

Q9. A particle of mass m moving with velocity v collides with another particle of the same mass at rest. The velocity of the first particle after collision is:
(A) v (B) −v **(C) 0** (D) −½
Correct answer: (C) 0
Explanation: For the intended head-on elastic collision of equal masses, the particles exchange velocities.

Q10. Moment of force is called:
(A) Moment arm (B) Couple (C) Couple arm **(D) Torque**
Correct answer: (D) Torque
Explanation: Torque is the turning effect or moment of a force.

Q11. If a car doubles its speed, its kinetic energy will be:
(A) The same (B) Doubled (C) Increased to three times **(D) Increased to four times**
Correct answer: (D) Increased to four times
Explanation: K.E. $\propto v^2$; doubling speed makes kinetic energy four times.

Q12. When a spring is compressed, what form of energy does it possess?
(A) Kinetic **(B) Potential** (C) Internal (D) Heat
Correct answer: (B) Potential
Explanation: A compressed spring stores elastic potential energy.

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GROUP – II

Time: 15 Minutes

Q1. Temperature of a substance is:

(A) The total amount of heat contained in it | **(B) Degree of hotness or coldness** | (C) The total number of molecules in it | (D) Dependent upon the intermolecular distance

Correct answer: (B) Degree of hotness or coldness

Explanation: Temperature indicates the degree of hotness or coldness.

Q2. A common method used to magnetise a material is:

(A) Hitting | (B) Heating | **(C) Stroking** | (D) Placing inside a solenoid having A.C.

Correct answer: (C) Stroking

Explanation: Repeated stroking in one direction can magnetise a material.

Q3. Physics is a branch of:

(A) Social science | (B) Life science | (C) Biological science | **(D) Physical science**

Correct answer: (D) Physical science

Explanation: Physics is a natural science and a branch of physical science.

Q4. A displacement can is used to measure:

(A) Volume of a solid | (B) Mass of liquid | (C) Mass of solid | (D) Volume of a liquid

Correct answer: (A) Volume of a solid

Explanation: The displaced water gives the volume of an irregular solid.

Q5. The numerical ratio of displacement to distance is:

(A) Always less than one | **(B) Equal to or less than one** | (C) Always equal to one | (D) Always greater than one

Correct answer: (B) Equal to or less than one

Explanation: Magnitude of displacement is never greater than distance travelled.

Q6. An object will continue its motion with constant acceleration until:

(A) The resultant force on it begins to decrease | (B) The resultant force on it begins to increase | **(C) The resultant force on it is zero** | (D) The resultant force is at right angle to its tangential velocity

Correct answer: (C) The resultant force on it is zero

Explanation: When the resultant force becomes zero, acceleration becomes zero.

Q7. Inertia depends upon:

(A) Velocity | (B) Acceleration | (C) Force | **(D) Mass**

Correct answer: (D) Mass

Explanation: Mass is the measure of an object's inertia.

Q8. Centripetal force is given by:

(A) rF | (B) $rF\cos\theta$ | (C) mv/r^2 | **(D) mv^2/r**

Correct answer: (D) mv^2/r

Explanation: The centripetal force is $F = mv^2/r$.

Q9. First condition of equilibrium is:

(A) $\Sigma Fy = 0$ | (B) $\Sigma Fx = 0$ | **(C) $\Sigma F = 0$** | (D) $\Sigma\tau = 0$

Correct answer: (C) $\Sigma F = 0$

Explanation: The vector sum of all forces on a body must be zero.

Q10. A bullet of mass 0.05 kg has a speed of 300 m s^{-1}. Its kinetic energy will be:

(A) 4500 J | **(B) 2250 J** | (C) 1500 J | (D) 1125 J

Correct answer: (B) 2250 J

Explanation: K.E. = $\frac{1}{2}mv^2 = \frac{1}{2} \times 0.05 \times 300^2 = 2250$ J.

Q11. Two metal plates of areas 2 and 3 square meters are placed in a liquid at the same depth. The ratio of pressures on the two plates is:

(A) 1 : 1 | (B) $\sqrt{2} : \sqrt{3}$ | (C) 2 : 3 | (D) 4 : 9

Correct answer: (A) 1 : 1

Explanation: Liquid pressure $P = \rho gh$ is independent of plate area.

Q12. The value of pressure on Mars:

(A) 7×10^2 Pa | (B) 4×10^4 Pa | (C) 1.6×10^4 Pa | (D) 2×10^5 Pa

Correct answer: (A) 7×10^2 Pa

Explanation: The approximate Martian surface pressure used in the paper is 7×10^2 Pa.