



PHYSICS SSC-I

Inclusive Scheme of Studies 2024 (1200 Marks)

SECTION – A (Marks 12)

Time allowed: 15 Minutes

Candidate Sign. _____

Invigilator Sign. _____

Answer Sheet No. _____

Version No.				
1	9	0	4	1

0	0	●	0	0
●	1	1	1	●
2	2	2	2	2
3	3	3	3	3
4	4	4	●	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	●	9	9	9

ROLL NUMBER						

0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

Deleting/overwriting is not allowed.
Do not use lead pencil.

Fill the relevant bubble against each question according to curriculum:

Question	A	B	C	D	A	B	C	D
1. Which pair correctly shows base quantity and its unit?	Temperature – kg	Time – m	Mass – kg	Speed – s	☐	☐	☐	☐
2. When a piece of soft iron is placed near a magnet, it becomes:	Permanently magnetized	Temporarily magnetized	Demagnetized	Electrically charged	☐	☐	☐	☐
3. The study of electricity and magnetism together is known as:	Electromagnetism	Nuclear Physics	Classical Mechanics	Particle Physics	☐	☐	☐	☐
4. A car travels 150 m in 10 seconds. What is its speed?	5 m/s	10 m/s	15 m/s	20 m/s	☐	☐	☐	☐
5. A 4 kg object reaches the ground with a kinetic energy of 156.8 J. Ignoring air resistance, from what height was it dropped? (Use $g = 9.8 \text{ m/s}^2$)	2 m	3 m	4 m	5 m	☐	☐	☐	☐
6. Which statement best explains why displacement is a vector quantity?	It has only magnitude	It depends on path length	It has magnitude and direction	It is measured in meters	☐	☐	☐	☐
7. When a north pole of a magnet is placed in an external magnetic field, it:	Always moves toward east	Experiences a force	Becomes a south pole	Stops producing a field	☐	☐	☐	☐
8. A gun recoils backward when a bullet is fired because:	The gun is heavier	Air pushes the gun	The bullet loses speed	Reaction forces act on gun	☐	☐	☐	☐
9. If a bar magnet is cut in half it will become:	The same magnet	Un-magnetized	A monopole	Magnet of less strength	☐	☐	☐	☐
10. In scientific research, a theory is:	A guess with no evidence	A personal opinion	A rule that never changes	Explanation based on experiments	☐	☐	☐	☐
11. A ball dropped freely from a tower reaches ground in 4s, the speed of impact of ball is:	0 m/s	2.45 m/s	19.6 m/s	39.2 m/s	☐	☐	☐	☐
12. A mosquito flying in different directions shows:	Linear motion	Random motion	Circular motion	Vibratory motion	☐	☐	☐	☐

1SA-I 26004-(M) —

• $v = \frac{d}{t}$ • $PE = mgh$ • $g = 9.8 \text{ m/s}^2$ • $g = \frac{v_f - v_i}{\Delta t}$



PHYSICS SSC-I

Inclusive Scheme of Studies 2024 (1200 Marks)

26

Time allowed: 2:45 Hours

Total Marks Sections B and C: 48

SECTION – B (Marks 30)

Q. 2 Attempt the following parts.

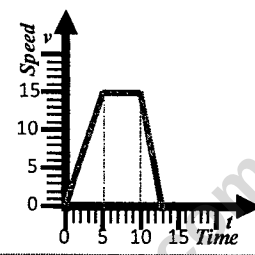
(10 x 3 =30)

(i)	Convert the following using appropriate prefixes: a. 0.002 m into mm b. 5×10^{-6} s into ns c. 3000 g into kg	1+1 +1	OR	How much force should be applied on an area of 20 cm^2 to get a pressure 4500 Pa?	03
(ii)	What is meant by precision? How a measurement can be precise but not accurate? (Explain with one example.)	1+2	OR	Discuss the energy conversions when a cyclist goes up to the top of a hill.	03
(iii)	Consider a spring with spring constant 8000 Nm^{-1} . If a force of 500 N is applied to spring. What will be the displacement of spring? Write answer in correct significant figure.	2+1	OR	What is meant by efficiency? Can any machine be 100% efficient? Justify your answer.	1+2
(iv)	How lubrication reduces friction between two surfaces? Explain with the help of an example.	03	OR	Differentiate Ferromagnetic and Paramagnetic materials on basis of domain theory.	1.5 +1.5
(v)	How does the atmospheric pressure vary with altitude? What special measure do the mountain climbers have to take?	1.5+ 1.5	OR	Differentiate qualitatively between rolling and sliding friction.	1.5 +1.5
(vi)	Describe plasma as the fourth state of matter. How the presence of free ions and electrons makes it different from solids, liquids, and gases?	2+1	OR	How different slopes represent three different types of motion in a speed time graph? Make sketches.	1x3
(vii)	A truck of mass 1500 kg moves with a velocity of 10 m/s, while a motorcycle of mass 150 kg moves at 20 m/s. a. Calculate the momentum of each vehicle. b. Which one has greater momentum and why?	1+2	OR	A ball is thrown straight upward with an initial speed of 19.6 m/s. Using $g = 9.8 \text{ ms}^{-2}$: a. After how much time does it reach the highest point? b. What is its velocity at the highest point?	2+1
(viii)	How is Pascal's law used in a hydraulic press to multiply force? Explain briefly.	03	OR	Compare classical mechanics and quantum mechanics. (Any three points)	1x3
(ix)	Differentiate magnetic and non-magnetic materials. (Any three)	1x3	OR	Why internal energy increases when temperature increases? Explain briefly.	03
(x)	Derive the formula for average orbital speed of a satellite.	03	OR	Describe that atmospheric pressure decreases with the increase in height above the earth surface.	03

SECTION – C (Marks 18)

Note: Attempt the following questions.

(3x6=18)

Q.3	Explain the domain theory of magnetism. Discuss the magnetic field of a bar magnet. Also draw its magnetic field lines showing direction.	3+2 +1	OR	a. Describe power as the rate of doing work also write its formula. b. State the SI units of power and work. c. A person does 300 J of work in 10 s. Calculate the power.	2+2 +2
Q.4	a. State Newton's Second Law. b. A cart of 15 kg is moving with 25 ms^{-1} . 75 N force is applied to stop the cart. How long does the cart take to stop?	2+4	OR	Explain the principle on which a manometer works. Also describe the construction and working of manometer.	2+2 +2
Q.5	A speed-time graph of a car shows the speed increasing from 0 to 15 m/s in 5 seconds, then staying constant for the next 5 seconds, and finally decreasing back to 0 m/s in 3 seconds.  a. Identify the type of motion in each interval (0–5 s, 5–10 s, 10–13 s). b. Calculate the acceleration during the first 5 seconds. c. Calculate the deceleration during the last 3 seconds.	2+2 +2	OR	a. What is equilibrium? b. State the difference between stable and unstable equilibrium. c. How the center of gravity affects the type of equilibrium? d. How lowering the center of gravity makes an object more stable? Give example.	1+2 +1 +2

— 1SA-I 26004 (M) —

$$F = Kx$$

$$P = \frac{F}{A}$$

$$p = mv$$

$$F = ma$$

$$v_f = v_i + at$$

$$P = \frac{W}{t}$$