



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	0	0	4	1

①	●	●	①	①
●	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	⑨

ROLL NUMBER						

①	①	①	①	①	①	①
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. A device measures a charge of 3000 nC. Convert it into microcoulombs (μC).	0.03 μC	3 μC	30 μC	300 μC	☐	☐	☐	☐
2. A cyclist moves 2 km in 4 minutes. What is the speed in m/s?	4 m/s	8.3 m/s	12 m/s	16.3 m/s	☐	☐	☐	☐
3. Which fundamental force is the strongest of all?	Gravitational	Electro-weak	Strong force	Magnetic	☐	☐	☐	☐
4. What is a reasonable estimate for the mass of a physics textbook?	2 mg	1 kg	10 kg	1 g	☐	☐	☐	☐
5. Which unit belongs to a derived quantity?	Second (s)	Kelvin (K)	Meter (m)	Newton (N)	☐	☐	☐	☐
6. If two unequal forces act parallel but in opposite directions, the forces are:	Unlike parallel forces	Balanced forces	Like parallel forces	Centripetal forces	☐	☐	☐	☐
7. A hypothesis is best described as:	A testable prediction	A universally accepted fact	A mathematical equation	A proven theory	☐	☐	☐	☐
8. When a soft iron piece is placed near a magnet, it:	Becomes a permanent magnet	Loses its mass	Gets temporary poles (N and S)	Repels the magnet	☐	☐	☐	☐
9. Why does a heavy object resist change in its motion?	It has greater inertia	It has more speed	It has more friction	It has no force	☐	☐	☐	☐
10. If a man applies 50 N of force to lift a load 0.5 m upward then what is the work done?	10 J	20 J	25 J	50 J	☐	☐	☐	☐
11. Which one of the following is the correct formula for magnetic field of a solenoid?	$B = \frac{\mu n}{\ell}$	$B = \mu_o n \ell$	$B = \frac{n \ell}{\mu_o}$	$B = n_o \ell$	☐	☐	☐	☐
12. A scientist who studies matter, energy, and their interactions is called a:	Chemist	Biologist	Engineer	Physicist	☐	☐	☐	☐

—1SA-I 26004-(B)—

• $\nu = \frac{d}{t}$ • $W = \vec{F} \cdot \vec{d}$ • $w = mg$



PHYSICS SSC-I

Inclusive Scheme of Studies 2024 (1200 Marks)

Time allowed: 2:45 Hours

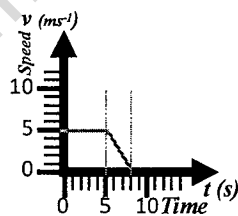
Total Marks Sections B and C: 48

SECTION – B (Marks 30)

Q. 2 Attempt the following parts.

(10 x 3 =30)

(Use of graph paper is not necessary. Candidates can make their own grid on answer book if required)

(i)	What is meant by density? Also write its formula and unit.	1x3	OR	Briefly describe scalar and vector quantities with one example each	1.5 +1.5
(ii)	Why soft magnetic materials, such as soft iron, are used to provide shielding from magnetic fields? Explain briefly.	03	OR	Sketch distance–time graph of an object when it is: a. At rest, b. Moving with constant speed, and c. Accelerating	1+1 +1
(iii)	What is average orbital speed? Why increasing the orbital radius increases the total distance traveled in one orbit?	1+2	OR	Briefly describe the following branches of physics: a. Optics b. Cosmology c. Biophysics	1x3
(iv)	A bicycle rider leans downward and widens the stance while turning. How these actions help prevent the bicycle from falling? Explain briefly.	03	OR	From given speed time graph, calculate: a. Total distance covered b. Acceleration in first 5 seconds	1.5 + 1.5
					
(v)	State the relationship between force and extension for a spring according to Hooke's Law.	03	OR	Differentiate between center of mass and center of gravity.	1.5 + 1.5
(vi)	How changes in force and mass can affect the acceleration of an object? Explain briefly in light of Newton's second law.	1.5+ 1.5	OR	A cyclist applies brakes and slows down from 12ms ⁻¹ to 4ms ⁻¹ in 3 seconds. Calculate the acceleration.	03
(vii)	What is plasma? How it differs from ordinary gases?	2+1	OR	Compare temporary magnets and permanent magnets. Give one example of each.	1.5 +1.5
(viii)	Under what conditions Newton's Laws do not remain applicable? (Give two conditions)	1.5 +1.5	OR	How the Earth's magnetic field protects life on the planet from harmful cosmic radiation? Explain briefly.	03
(ix)	A digital balance gives slightly different readings each time a stone is placed on it: a. Identify the error. b. How can this error be fixed?	1+2	OR	A 2 kg ball changes its velocity from 4ms ⁻¹ to 10ms ⁻¹ . Calculate the impulse applied to the ball.	03
(x)	Prove that $K.E = \frac{1}{2}mv^2$	03	OR	Compare precision and accuracy in measurements.	03

SECTION – C (Marks 18)

Note: Attempt the following questions.

(3x6=18)

Q.3	Describe the three states of equilibrium. For each give one clear daily-life example.	2x3	OR	On what principle hydraulic brakes in vehicles work? How the system multiplies force to stop the vehicle effectively? Make a neat sketch.	1+4 +1
Q.4	A roller coaster car of mass 500 kg starts from rest at the top of a hill 20 m high. a. Calculate its Gravitational PE at the top. b. Assuming no friction, calculate its Kinetic Energy (KE) at the bottom of the hill. c. How friction and air resistance affect the KE in real situations?	2x3	OR	A mechanic applies 80 N force on a 0.3 m spanner to loosen a tight nut. He increases the distance to 0.6 m by using a longer spanner extension. a. Why the nut becomes easier to loosen with a longer spanner? b. Calculate the amount of force applied on longer spanner to loosen the same nut.	3+3
Q.5	Describe the long-term advantages of using renewable energy sources. Also give the limitations of non-renewable sources. (Three points each)	3+3	OR	Describe any three methods of magnetizing a material.	2x3

1SA-I 26004 (B)

$$\tau = Fd$$

$$F = \frac{\Delta p}{\Delta t}$$

$$m_1u_1 + m_2u_2 = m_1v_1 + m_2v_2$$

$$\frac{F_1}{A_1} = \frac{F_2}{A_2}$$

$$v = \frac{2\pi r}{T}$$

$$p = mv$$

$$g = 10ms^{-2}$$

$$v_f = v_i + at$$

$$2aS = v_f^2 - v_i^2$$

$$P = \rho gh$$