Federal Board SSC-I Examination
Physics Model Question Paper
(Curriculum 2022-2023)

ROLL NUMBER					
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1	1	1	1	1	1
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Section - A (Marks 12)

Time Allowed: 20 minutes

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/ overwriting is not allowed. *Do not use lead pencil.*

Candidate Sign._____ **Invigilator Sign**. _____

Q1. **Fill the relevant bubble against each question according to curriculum**. **Each part carries one mark.**

S #	Question	(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)
1.	When a body moves in a circular path, its velocity is:	Constant	Variable	Zero	Increasing	○	○	○	○
2.	The force which opposes the relative motion between two surfaces in contact is known as:	Friction	Gravitational force	Electrostatic force	Nuclear force	○	○	○	○
3.	A train is traveling at 20 m/s and comes to a stop in 40 seconds. What is the magnitude of deceleration of the train?	0.5 m/s^2	2 m/s^2	0.05 m/s^2	0.2 m/s^2	○	○	○	○
4.	If two objects, one heavy and one light, are dropped from the same height, neglecting air resistance, which object will hit the ground first?	The heavy object	The light object	Both objects will hit the ground at the same time	It depends on the shape of the objects	○	○	○	○
5.	Sub branch of Physics in which we study the motion of object along with causes and effects is called:	Kinematics	Dynamics	Astro Physics	Optics	○	○	○	○
6.	Which of the followings is a magnetic material?	Plastic	Wood	Copper	Cobalt	○	○	○	○
7.	Which of the followings is a greatest prefix?	Deca	Deci	Milli	Nano	○	○	○	○
8.	joule (J) is the unit of work which is equal to:	Newton	kg m s^{-2}	Watt second	Newton second	○	○	○	○
9.	A car, an elephant and a cricket ball have same kinetic energies. Which of these have greater speed?	Car	Elephant	Cricket	All have same speed	○	○	○	○
10.	Magnetic field lines:	Are farthest at poles	Intersect each other	Never intersect each other	Do not pass in vacuum	○	○	○	○
11.	The Branch of Physics that is most important when studying how glasses help people see:	Thermodynamics	Electromagnetism	Mechanics	Optics	○	○	○	○
12.	Which term describes a thoroughly tested idea in physics?	Idea	Hypothesis	Theory	Law	○	○	○	○

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Time allowed: 2.45 hour Total Marks Sections B and C: 53

Note: Answer all parts from Section 'B' and all questions from Section 'C' on the **E-sheet**. Write your answers on the allotted/given spaces.

SECTION – B (Marks 33)

Q. 2 Answers the following questions briefly. (11 x 3 = 33)

(i)	Differentiate between precision and accuracy	**03**	**OR**	Differentiate between center of gravity and center of mass.	**03**
(ii)	Draw the speed time graph for uniform acceleration. Use this graph to show that gradient of speed time graph gives acceleration.	**03**	**OR**	Which will have greater spring constant, steel spring or rubber spring?	**03**
(iii)	Differentiate between strong nuclear force and electromagnetic force.	**03**	**OR**	Define astrophysics, biophysics and optics	**03**
(iv)	Define impulse. Write its formula and SI unit.	**03**	**OR**	How a vector is represented graphically and symbolically?	**03**
(v)	Provide justification that pressure exerts perpendicular force on a surface?	**03**	**OR**	Suggest changes in design of liquid in glass thermometer to increase its sensitivity and range?	**03**
(vi)	Differentiate between paramagnetic materials and diamagnetic materials.	**03**	**OR**	Why plasma is called fourth state of matter?	**03**
(vii)	State Pascal law. List any two its applications	**2+1**	**OR**	What are domains? Show alignment of domains in figures for magnetized and un magnetized materials.	**2+1**
(viii)	How manometer is used to measure the gas pressure?	**03**	**OR**	What is average speed of a car if it completes a circle of radius 200m in 5minutes?	**03**
(ix)	Cutting edge of knife is made sharper. How does it cut vegetables easily?	**03**	**OR**	If radius of the orbit is doubled then what will be effect on its orbital velocity of a satellite?	**03**
(x)	What steps would you take to minimize random error from measurement?	**03**	**OR**	How magnetic field is used to record sound on magnetic tapes or on hard discs?	**03**
(xi)	Differentiate between hypothesis and theory.	**03**	**OR**	Give three differences between vectors and scalars.	**03**

SECTION – C (Marks 20)

Note: Attempt all questions. Marks of each question are given along with each question. $(4 \times 5 = 20)$

Q.3	What are different types of motion? Give two examples of each.	**05**	**OR**	What are soft magnetic materials? Discuss magnetic shielding effect of soft magnetic materials.	**01+04**
Q.4	State and prove Newton's second law of motion	**01+04**	**OR**	Define kinetic energy and derive its formula.	**01+04**
Q.5	A long uniform steel bar of length of 100 cm is balanced on a wedge at its middle. Two weights W_1 and W_2 are suspended at distance of 0.2 m and 0.4 m respectively form the wedge. If weight W_1 is 70 N then find weight W_2	**05**	**OR**	A hydraulic press lifts mass of 500 kg when we apply force of 10 N on small piston. Radius of its small piston is 15 cm, find the radius of its large piston.	**05**
Q.6	Discuss the structure and working of thermos-couple thermometer.	**05**	**OR**	Define centripetal force. Write its formula. Give three examples from daily life in which centripetal force plays an important role.	**01+01+03**

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Alignment of Questions with Student Learning Outcomes

Sr No	Section: Q. No. (Part no.)	Content Domain / Area	Student Learning Outcomes	Cognitive Level *	Allocated Marks in Model Paper
1	A: Q1(1)	Domain B	[SLO: P-09-B-53] Describe qualitatively motion in a circular path due to a centripetal force	U	1
2	A: Q1(2)	Domain B	[SLO: P-09-B-35] Analyze the dissipative effect of friction	U	1
3	A: Q1(3)	Domain B	[SLO: P-09-B-07] Define and calculate acceleration	A	1
4	A: Q1(4)	Domain B	[SLO: P-09-B-10] Use the approximate value 9.8m/s^2 for free fall acceleration near Earth to solve problems	U	1
5	A: Q1(5)	Domain B	[SLO: P-09-B-18] Explain that the mass of an object resists changes from its state of rest or motion (inertia)	K	1
6	A: Q1(6)	Domain E	[SLO: P-09-E-03] State the difference between magnetic and non- magnetic materials	K	1
7	A: Q1(7)	Domain A	[SLO: P-09-A-06] Analyze and express numerical data using prefixes	U	1
8	A: Q1(8)	Domain B	SLO: P-09-B-60 Define work done.	K	1
9	A: Q1(9)	Domain B	SLO: P-09-B-66 Use the formulas for kinetic and Gravitational potential energy to solve problems involving simple energy conversions	A	1
10	A: Q1(10)	Domain E	[SLO: P-09-E-09] state that the relative strength of a magnetic field is represented by the spacing of the magnetic field lines	U	1
11	A: Q1(11)	Domain G	[SLO: P-09-G-02] Explain with examples that physics has many sub- fields, and in today's world involves interdisciplinary fields.	K	1
12	A: Q1(12)	Domain G	[SLO:P-09-G-06] Understand the terms 'hypothesis', theory' and 'law' in the context of research in the physics	K	1
13	B: Q2(i)	Domain A Domain B (Dynamics)	[SLO: P-09-A-18] Differentiate between precision and accuracy OR [SLO: P-09-B-47] State what is meant by center of mass and center of gravity	U	3
14	B: Q2(ii)	Domain B (Kinematics) Domain B (Dynamics)	[SLO: P-09-B-09] Sketch, plot and interpret distance—time and Speed-time graphs. OR [SLO: P-09-B-56] Define and calculate the spring constant [Apply the equation, Spring Constant = force/extension k= F/x to solve problem involving simple Springs]	U	3

15	B: Q2(iii)	Domain B (Dynamics) Domain G	[SLO: P-09-B-25] State that there are three fundamental forces and describe them in terms of their relative strengths OR [SLO: P-09-G-02] Explain with examples that physics has many sub- fields, and in today's world involves interdisciplinary fields.	K	3
16	B: Q2(iv)	Domain B (Dynamics) Domain A	[SLO: P-09-B-40] Define and calculate impulse. OR [SLO: P-09-A-07] Differentiate between scalar and vector quantities. [scalar is magnitude (size) only and that a vector quantity has magnitude and direction. students should be able to represent vectors graphically]	K	3
17	B: Q2(v)	Domain B (Pressure and deformation in solids) Domain C	[SLO: P-09-B-79] Analyze in situations how pressure at surface produces a force in a direction at right angles to the surface [Can make reference to experiments to verify this principle] OR [SLO: P-09-C-09] illustrate what is meant by the sensitivity, range and linearity of thermometers	A	3
18	B: Q2(vi)	Domain E Domain C	[SLO: P-09-E-12] Differentiate between ferromagnetic, paramagnetic and diamagnetic materials. OR [SLO: P-09-C-04] Describe plasma as a fourth state of matter	U	3
19	B: Q2(vii)	Domain B (Dynamics) Domain E	[SLO: P-09-B-86] Define and apply Pascal's law OR [SLO: P-09-E-11] Explain qualitatively in terms of the domain theory of magnetism how materials can be magnetized and demagnetized	K	3
20	B: Q2(viii)	Domain B (Pressure and deformation in solids) Domain B (Kinematics)	[SLO: P-09-B-85] Analyze the workings and applications of a manometer OR [SLO: P-09-B-04] Define and Calculate average speed	A	3
21	B: Q2(ix)	Domain B (Pressure and deformation in solids) Domain F	SLO: P-09-B-78 Describe how pressure varies with force and area in the context of everyday examples OR [SLO: P-09-F-01] Define and calculate average orbital speed	U	3
22	B: Q2(x)	Domain A Domain E	[SLO: P-09-A-17] Critique and analyze experiments for sources of error [including identifying sources of systematic and random error in measurements and suggesting steps to correct them] OR [SLO: P-09-E-14] Analyze applications of magnets in recording technology	U	3
23	B: Q2(xi)	Domain G Domain A	[SLO:P-09-G-06] Understand the terms 'hypothesis', theory' and 'law' in the context of research in the physics OR [SLO: P-09-A-07] Differentiate between scalar and vector quantities	U	3

24	C: Q3	Domain B (Kinematics) Domain E	[SLO:P-09-B-01] Differentiate between different types of motion OR [SLO: P-09-E-15] State that soft magnetic materials such as soft iron) can be used to provide shielding from magnetic fields	K	5
25	C: Q4	Domain B (Dynamics) Domain B (Work, Energy)	[SLO: P-09-B-30] State and apply Newton's second law in terms of acceleration OR [SLO: P-09-B-64] Prove that Kinetic Energy $Ek = 1/2\ mv^2$	U	5
26	C: Q5	Domain B (Dynamics) Domain B (Pressure and deformation in solids)	[SLO: P-09-B-45] Analyze objects in equilibrium using the principle of moments OR [SLO: P-09-B-86] Define and apply Pascal's law [Apply Pascal's law to systems such as the transmission of pressure in hydraulic system with particular reference	A	5
27	C: Q6	Domain C Domain B (Dynamics)	[SLO: P-09-C-10] Differentiate between the structure and function of liquid-in-glass and of thermocouple thermometers. OR [SLO: P-09-B-53] Describe qualitatively motion in a circular path due to a centripetal force	U	5

*Cognitive Level
K: Knowledge
U: Understanding
A: Application

Table of Specification Model Paper Physics SSC-I

Cognitive Level	Measurements A	Mechanics B				Heat and Thermodynamics C	Electricity and Magnetism E	Modern Physics F	Nature of Science G		
Assessment Objectives	**(A1-A19)**	**Kinematics (B1-B15)**	**Dynamics (B1-B54)**	**Pressure & Deformation in Solids (B77-B86 & B55-B59)**	**Work And Energy (B60-B76)**	**(C1-C11)**	**(E1-E15)**	**(F1-F2)**	**(G1-G8)**	**Total Marks**	**Percentage**
K (Knowledge)	Q2(iv /s)3	Q3(f)5	Q2(iv/f)3 Q2(iii/f)3 Q1(v)1	Q2(vii/f)3	Q1(8)1		Q1(6)1 Q3(s)5 Q2(vii/s)3		Q1(11)1 Q2(iii/s)3 Q1(12)1	33	28%
U (Understanding)	Q1(7)1 Q2(x/f)3 Q2(i/f)3 Q2(xi/s)3	Q2(ii/f)3 Q1(4)1	Q2(i/s)3 Q1(1)1 Q1(2)1 Q4(f)5 Q6(s)5	Q2(ix/f)3 Q2(ii/s)3	Q4(s)5	Q2(vi/s)3 Q6(f)5	Q1(10)1 Q2(vi/f)3 Q2(x/s)3	Q2(ix/s)3	Q2(xi/f)3	61	52%
A (Application)		Q2(viii/s)3 Q1(3)1	Q5(f)5	Q2(v/f)3 Q2(viii/f)3 Q5(s)5	Q1(9)1	Q2(v/s)3				24	20%
Total Marks	13	13	27	20	07	11	16	03	08	118	
Total Percentages	11%	11%	23%	17%	6%	9%	14%	2%	7%		100%

Note:

1 This ToS does not reflect policy, but it is particular to this model question paper.

2 Proportionate / equitable representation of the content areas may be ensured.

3 The percentage of cognitive level is 30%, 50%, and 20% for knowledge, understanding, and application, respectively with **± 5%** variation.

4 While selecting alternative questions for Short Response Questions (SRQs) and Extended Response Questions (ERQs), it must be kept in mind that:

- Difficulty levels of two alternative questions of the internal choice will be same
- SLOs of the two alternative questions of the internal choice must be different

Key: Question Number (part/ first choice) marks example: Q2 (i / f) 2 , Question Number (part/ second choice) marks Q2 (i / s) 2