PHYSICS SSC–I (3rd Set)
SECTION – A (Marks 12)
Time allowed: 15 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.**

Q.1   Fill the relevant bubble for each part. All parts carry one mark.

(1)   Which one of the following instrument is most suitable for measuring thickness of the physics book?
   A.   Meter rule   ◯   B.   Vernier calipers   ◯
   C.   Measuring tape   ◯   D.   Screw gauge   ◯

(2)   Acceleration of bodies falling freely is:
   A.   Different for different heights   ◯
   B.   Different for different masses   ◯
   C.   Same for all bodies   ◯
   D.   Different for different materials   ◯

(3)   The coaster cars move around the loop, the track provides:
   A.   Applied force   ◯   B.   Normal force   ◯
   C.   Centripetal force   ◯   D.   Frictional force   ◯

(4)   A body has a weight of 20N. How much force is required to move it vertically upward with an acceleration of $2ms^{-2}$?
   A.   10 N   ◯   B.   20 N   ◯
   C.   2.040 N   ◯   D.   4.1 N   ◯

(5)   The angle between two rectangular components of a vector is:
   A.   30°   ◯   B.   45°   ◯
   C.   60°   ◯   D.   90°   ◯

(6)   It is easy to open a door by pulling or pushing at:
   A.   Axis point   ◯   B.   Middle of door   ◯
   C.   Corners of the door   ◯   D.   Handle of the door   ◯

(7)   The value of universal gravitational constant is:
   A. 6.4×10^{6} Nm^2kg^{-2} ◯   B. 6×10^{24} Nm^2kg^{-2} ◯
   C. 6.67×10^{-11} Nm^2kg^{-2} ◯   D. 10 Nm^2kg^{-2} ◯

(8) The work done in lifting an object of mass 10kg through height of 1m is:
A. 0J ○ B. 10J ○
C. 100J ○ D. 1000J ○

(9) Barometer is used to measure:
A. Weight ○ B. Density ○
C. Atmospheric pressure ○ D. Volume ○

(10) Sum of kinetic and potential energies associated with all particles of an object is called:
A. Heat ○ B. Temperature ○
C. Internal energy ○ D. Mechanical energy ○

(11) The temperature of an object is 60°C. Its temperature in Fahrenheit is:
A. $120°F$ ○ B. $130°F$ ○
C. $140°F$ ○ D. $150°F$ ○

(12) The rate of emission of radiation from certain object depends on:
A. Internal energy ○ B. Heat ○
C. Surface area ○ D. Latent heat ○

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Federal Board SSC-I Examination
Physics Model Question Paper
(Curriculum 2006)

Time allowed: 2.45 hours   Total Marks: 53

Note: Answer any eleven parts from Section 'B' and attempt any two questions from Section 'C' on the separately provided answer book. Write your answers neatly and legibly.

SECTION – B (Marks 33)

Q.2 Attempt any **ELEVEN** parts from the following. All parts carry equal marks.

$(11 \times 3 = 33)$

i. How measuring cylinder can be used to measure volume of an irregular object?

ii. What is zero error? Differentiate between positive and negative zero error in case of Vernier caliper.

iii. A boy throws a ball vertically up. It returns the ground after 10 seconds. Find the maximum height reached by the ball.

iv. Can a body moving with certain velocity in the direction of east have acceleration in the direction of west?

v. In terms of Newton's 3rd law of motion, discuss action and reaction forces in the following examples:

(a) Book kept on table. (b) Motion of rocket (c) Pushing a shopping cart.

vi. How a banked road makes driving safe?

vii. Why vehicles are made heavy at the bottom?

viii. Define gravitational field and gravitational field strength.

ix. Briefly describe working principle of see-saw.

x. Briefly describe producing of electrical energy from fossil fuels, using block diagram.

xi. Explain the use of Hydrometer to measure the density of a car battery acid.

xii. The weight of a metal spoon in air is 0.38 N. Its weight in water is 0.32 N. Find its density.

xiii. What is anomalous expansion of water?

xiv. Briefly explain convection in seawater to support marine life.

xv. Why is the cutting edge of the knife made very thin?

SECTION – C (Marks 20)

Note: Attempt any **TWO** questions. All questions carry equal marks.   **(2 × 10 = 20)**

Q.3 a. Write detailed note on significant figures.   **(6)**

b. Calculate the value of g, the acceleration due to gravity at an altitude of 100 km. The mass of Earth is 6.0 x 10^{24} Kg. The radius of Earth is 6400 km.   **(4)**

Q.4 a. What is kinetic energy. Derive its mathematical relation $(K.E = \frac{1}{2}mv^2)$ **(6)**

b. Find the volume of a brass cube at 100℃, whose side is 10cm at 0℃ (coefficient of linear thermal expansion of brass= 1.9 x 10^{-5} k^{-1}).   **(4)**

Q.5 a. Define friction. How friction opposes motion. Enlist two disadvantages of it?

(1+3+2)

b. How various surfaces can be compared by a Leslie cube?   **(4)**

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PHYSICS SSC-I (3rd Set)
Student Learning Outcomes Alignment Chart
(Curriculum 2006)

SECTION – A

Q.1
(1) Describe the working of vernier callipers and screw gauge for measuring length.
(2) Solve problems related to freely falling bodies using 10 ms^{-2} as the acceleration due to gravity
(3) Identify the use of centripetal force
(4) Solve problem using $F = ma$, and $w = mg$.
(5) Describe how a force is resolved into its perpendicular components.
(6) Define moment of force or torque as moment = force x perpendicular distance from pivot to the line of action of force.
(7) Solve problems using Newton's law of gravitation.
(8) Calculate work done using equation Work = force x distance moved in the direction of force
(9) Describe how the height of a liquid column may be used to measure the atmospheric pressure
(10) Define heat (as the energy transferred resulting from the temperature difference between two objects).
(11) Convert the temperature from one scale to another (Fahrenheit, Celsius and Kelvin scales).
(12) Describe the process of radiation from all objects.

SECTION – B

Q.2
i.   Determine volume of an irregular shaped object using a measuring cylinder.
ii.   Measure length and diameter of a cylinder and calculate the volume with Vernier calipers
iii. Solve problems related to freely falling bodies using 10 ms^{-2} as the acceleration due to gravity.
iv.   Solve problems related to uniformly accelerated motion using appropriate equations.
v.   State Newton's laws of motion.
vi.   Identify the use of centripetal force in (i) safe driving by banking roads (ii) washing machine dryer (iii) cream separator.
vii. Define equilibrium and classify its types by quoting examples from everyday life.
viii. Explain gravitational field as an example of field of force.
ix.   Describe the working principle of see-saw
x.   Describe the process of electricity generation by drawing a block diagram of the process from fossil fuel input to electricity output.
xi.   Explain the use of Hydrometer to measure the density of a car battery acid.
xii. Determine the density of an object using Archimedes principle.
xiii. Explain the thermal expansion of liquids (real and apparent expansion).

xiv.   Explain convection in seawater to support marine life.
xv.   Explain how pressure varies with force and area in the context of everyday examples.

SECTION – C

Q.3   a.   Describe the need using significant figures for recording and stating results in the laboratory.

   b.   Solve problems using Newton's law of gravitation.

Q.4   a.   Define energy, kinetic energy and potential energy. State unit of energy, prove that Kinetic Energy $= \frac{1}{2} mv^2$

   b.   Describe qualitatively the thermal expansion of solids (linear and volumetric expansion).

Q.5   a.   Explain the effect of friction on the motion of a vehicle.

   b.   Investigate the absorption of radiation by a black surface and silvery surfaces using Leslie cube.

PHYSICS SSC-I (3rd Set)

TABLE OF SPECIFICATION

Topics	Unit-1	Unit-2	Unit-3	Unit-4	Unit-5	Unit-6	Unit-7	Unit-8	Unit-9	Total marks	Percentage
Knowledge Based	1(1)(1) 2 ii(3) 3 a(6)		5 a(6)	1(5)(1)	1(7)(1) 2 viii(3)	4 a(2)		1(10)(1)		24	27.6%
Understanding based	2 i(3)	1 (2)(1) 2 iii(3) 2 iv(3)	1(4)(1) 2 v(3) 2 vi(3)	2 vii(3) 2 ix(3)		1(8)(1) 2 x(3) 4 a(4)	2 xiii(3) 2 xi(3) 2xv(3)		1(12)(1) 2xiv(3)	44	50.6%
Application Based			1(3)(1)	1(6)(1)	3 b(4)		1(9)(1) 2 xii(3)	4 b(4) 1(11)(1)	5 b(4)	19	21.8%
Total marks for each Unit	13	7	14	8	8	10	13	6	8	87	100%

KEY:

1-1(1)

Question No-Part No. (Allocated Marks)

Note: (i) The policy of FBISE for knowledge based questions, understanding based questions and application based questions is approximately as follows:

a) 30% knowledge based.
b) 50% understanding based.
c) 20% application based.

(ii) The total marks specified for each unit/content in the table of specification is only related to this model question paper.

(iii) The level of difficulty of the paper is approximately as follows:

a) 40% easy
b) 40% moderate
c) 20% difficult