



BK BIRLA CENTRE FOR EDUCATION
SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY | CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL



PERIODIC TEST-2-2024-25

PHYSICS (042)

Class : XI
Date : 05/12/2024

Duration: 1 Hr
Max. Marks: 25

Instructions:

- i. There are three sections A, B, and C with 13 questions in total, Section A has 3 Multiple Choice Questions and 2 Assertion Reasoning based Question of one mark each, Section B has 4 questions of two marks each and Section C has 4 questions of three marks each.
- ii. All questions are compulsory.
- iii. Calculators are not allowed.

Section A

1. The centripetal force required by the artificial satellite to revolve around earth is provided by:
(a) Fuel contained in the satellite (b) Gravitational force due to sun
(c) Gravitational force due to earth (d) Thrust produced by burning fuel
2. In which region of earth the weight of a body is slightly greater than the other regions?
(a) At polar region (b) At equator (c) Tropic of Cancer (d) None of this
3. According to Hooke's law of elasticity, if stress is increased, then the ratio of stress to strain:
(a) Becomes zero (b) Remains constant (c) Decreases (d) Increases

For Questions 4 and 5, two statements are given –one labelled Assertion (A) and other labelled Reason (R). Select the correct answer to these questions from the options as given below.

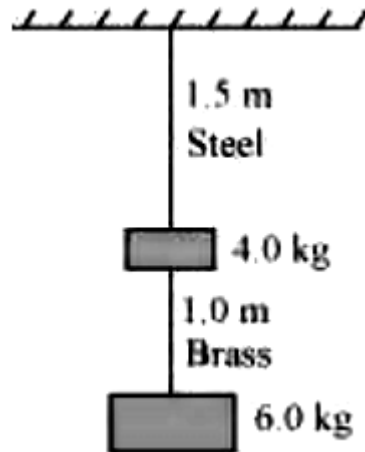
- (a) If both Assertion and Reason are true and Reason is correct explanation of Assertion.
 - (b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - (c) If Assertion is true but Reason is false.
 - (d) If both Assertion and Reason are false.
4. Assertion: The gravitational attraction of moon is much less than that of earth.
Reason: Moon is a natural satellite of the earth.
 5. Assertion: For small deformations, the stress and strain are proportional to each other.
Reason: A class of solids called elastomers does not obey Hooke's law.

Section B

6. Why is it that there is no atmosphere on the moon? Explain. 2
7. If a body is taken to a height $R/4$ from the surface of the earth, find percentage change in the weight of the body. Here R is the radius of the earth. 2
8. State and explain Hooke's law. 2
9. Define Young's modulus. Write its SI unit and Dimensional formula. 1+1

Section C

10. What is escape speed? Obtain an expression for the escape speed on the surface of the earth. 3
11. Obtain an expression for the acceleration due to the gravity on the surface of the earth in terms of mass and radius of the earth. Discuss the variation in acceleration due to gravity with altitude and depth. 3
12. Two wires of diameter 0.25 cm, one made of steel and the other made of brass are



loaded as shown in Figure. The unloaded length of steel wire is 1.5 m and that of brass wire is 1.0 m. compute the elongations of the steel and the brass wires. 3

13. Explain any two applications of elastic behavior of solids in daily life. 3

-----All the Best-----