ROLL NUMBER				

SET B

INDIAN SCHOOL MUSCAT
SECOND PERIODIC TEST-2023

SUBJECT: PHYSICS

CLASS: XI **Sub. Code: 042** **Time Allotted: 50mts.**
16.01.2023 **Max. Marks: 20**

GENERAL INSTRUCTIONS:

(a) Answer all questions.
(b) There are 3 sections.
(c) Section A- One case study question carries four marks.
(d) Section B -Five short answer questions carry two marks each.
(e) Section C -Two short answer questions carry three marks each.
(f) Use log tables, if necessary.

SECTION A
CASE STUDY

1. **Read the following paragraph and answer the questions.**

We know that the earth attracts every object with a certain force and this force depends on the mass (m) of the object and the acceleration due to the gravity (g). The weight of an object is the force with which it is attracted towards the earth. Mathematically W = mg Where, W = weight of object m = mass of object g = acceleration due to the gravitational force as the weight of an object is the force with which it is attracted towards the earth, the SI unit of weight is the same as that of force, that is, Newton (N). The weight is a force acting vertically downwards; it has both magnitude and direction. We have learnt that the value of g is constant at a given place and varies from equator to pole. Therefore, at a given place, the weight of an object is directly proportional to the mass, say m, of the object, that is, W α m. It is due to this reason that at a given place, we can use the weight of an object as a measure of its mass.

(i) Write the dimensional formula of weight. 1

(ii) Whether weight is scalar quantity or vector quantity? Justify your answer. 1

(iii) If the force of gravity acts on all bodies in proportion to their masses, then why doesn't A heavy body fall faster than a light body? 2

OR

Write two difference between mass and weight.

SECTION B

2. The breaking stress of a material is 10^8 Nm^{-2}. Find the greatest length of a wire that could hang vertically without breaking. Density of material= 3000 kgm^{-3}. 2

3. Derive an expression for the elastic potential energy stored in a stretched wire under stress. 2

4. Represent graphically the variation of extension with load in an elastic body. On the graph mark: 2
   (i) Hooke's law region (ii) Elastic limit

5. Derive an expression for the escape velocity on earth. 2

6. (i) Define the term modulus of rigidity and write its SI unit. 1
   (ii) Why are the bridges declared unsafe after long use? 1

SECTION C

7. State and prove Kepler's second law of planetary motion. 3

8. How much below the surface of the earth does the acceleration due to gravity become 1 % of its value at earth's surface? Radius of the earth = 6400 km. 3

END OF THE QUESTION PAPER

ROLL NUMBER				

SET C

INDIAN SCHOOL MUSCAT
SECOND PERIODIC TEST

SUBJECT: PHYSICS
Sub. Code: 042

CLASS: XI
16.01.2023

Time Allotted: 50mts.
Max. Marks: 20

GENERAL INSTRUCTIONS:

(a) Answer all questions.
(b) There are 3 sections.
(c) Section A- One case study question carries four marks.
(d) Section B -Five short answer questions carry two marks each.
(e) Section C -Two short answer questions carry three marks each.
(f) Use log tables, if necessary.

SECTION A
CASE STUDY

1. **Read the following paragraph and answer the questions.**

We know that the earth attracts every object with a certain force and this force depends on the mass (m) of the object and the acceleration due to the gravity (g). The weight of an object is the force with which it is attracted towards the earth. Mathematically W = mg, Where W = weight of object m = mass of object g = acceleration due to the gravitational force as the weight of an object is the force with which it is attracted towards the earth, the SI unit of weight is the same as that of force, that is, Newton (N). The weight is a force acting vertically downwards; it has both magnitude and direction. We have learnt that the value of g is constant at a given place and varies from equator to pole. Therefore, at a given place, the weight of an object is directly proportional to the mass, say m, of the object, that is, W α m. It is due to this reason that at a given place, we can use the weight of an object as a measure of its mass.

(i) Whether weight is scalar quantity or vector quantity? Justify your answer. 1

(ii) Write the dimensional formula of weight. 1

(iii). Write two difference between mass and weight. 2

OR

If the force of gravity acts on all bodies in proportion to their masses, then why doesn't A heavy body fall faster than a light body?

SECTION B

2. Represent graphically the variation of extension with load in an elastic body. On the graph mark: 2
   (i) Elastic limit (ii) Breaking point
3. (i) Define Bulk modulus of elasticity and write its SI unit. 1
   (ii) Why are the bridges declared unsafe after long use? 1
4. Derive an expression for the elastic potential energy stored in a stretched wire under stress. 2
5. The breaking stress of a material is $\mathbf{10^8}$ Nm^{-2}. Find the greatest length of a wire that could hang vertically without breaking. Density of material= 3000 kgm^{-3}. 2
6. Derive an expression for variation in acceleration due to gravity with depth. 2

SECTION C

7. How much below the surface of the earth does the acceleration due to gravity become 1 % of its value at earth's surface? Radius of the earth = 6400 km. 3
8. State and prove Kepler's third law of planetary motion. 3

END OF THE QUESTION PAPER

ROLL NUMBER				

SET A

INDIAN SCHOOL MUSCAT
SECOND PERIODIC TEST-2023

SUBJECT: PHYSICS

CLASS: XI **Sub. Code: 042** **Time Allotted: 50mts.**
16.01.2023 **Max. Marks: 20**

GENERAL INSTRUCTIONS:

(a) Answer all questions.
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SECTION A
CASE STUDY

1. **Read the following paragraph and answer the questions.**

We know that the earth attracts every object with a certain force and this force depends on the mass (m) of the object and the acceleration due to the gravity (g). The weight of an object is the force with which it is attracted towards the earth. Mathematically W = mg, Where W = weight of object m = mass of object g = acceleration due to the gravitational force as the weight of an object is the force with which it is attracted towards the earth, the SI unit of weight is the same as that of force, that is, Newton (N). The weight is a force acting vertically downwards; it has both magnitude and direction. We have learnt that the value of g is constant at a given place and varies from equator to pole. Therefore, at a given place, the weight of an object is directly proportional to the mass, say m, of the object, that is, W α m. It is due to this reason that at a given place, we can use the weight of an object as a measure of its mass.

(i) Whether weight is scalar quantity or vector quantity? Justify your answer. 1

(ii) Write the dimensional formula of weight. 1

(iii). Write two difference between mass and weight. 2

OR

If the force of gravity acts on all bodies in proportion to their masses, then why doesn't A heavy body fall faster than a light body?

SECTION B

2. Derive an expression for the elastic potential energy stored in a stretched wire under stress. 2

3. (i) Why are the bridges declared unsafe after long use? 1

   (ii) Define the term Young's modulus of elasticity and write its SI unit. 1

4. Represent graphically the variation of extension with load in an elastic body. On the graph mark: 2

   (i) Elastic limit (ii) Breaking point

5. The breaking stress of a material is $\mathbf{10^8}$ Nm^{-2}. Find the greatest length of a wire that could hang vertically without breaking. Density of material= 3000 kgm^{-3}. 2

6. Derive an expression for variation in acceleration due to gravity with height. 2

SECTION C

7. How much below the surface of the earth does the acceleration due to gravity become 1 % of its value at earth's surface? Radius of the earth = 6400 km. 3

8. State and prove Kepler's third law of planetary motion. 3

END OF THE QUESTION PAPER