AGA KHAN UNIVERSITY EXAMINATION BOARD

HIGHER SECONDARY SCHOOL CERTIFICATE

CLASS XI

ANNUAL EXAMINATIONS (THEORY) 2023

Physics Paper II

Time: 1 hour 30 minutes Marks: 35

INSTRUCTIONS

Please read the following instructions carefully.

1. Check your name and school information. Sign if it is accurate.

I agree that this is my name and school. **Candidate's Signature**

RUBRIC

2. There are TEN questions. Answer ALL questions. Questions 9 & 10 each offer TWO choices. Attempt any ONE choice from each.

3. When answering the questions:

   Read each question carefully.
   Use a black pointer to write your answers. DO NOT write your answers in pencil.
   Use a black pencil for diagrams. DO NOT use coloured pencils.
   DO NOT use staples, paper clips, glue correcting fluid, or ink erasers.
   Complete your answer in the allocated space only. DO NOT write outside the answer box.

4. The marks for the questions are shown in brackets ( ).

5. You may use a scientific calculator if you wish.

Q.1. (Total 3 Marks)

Categorise the following dartboards on the given basis.

I. Poor accuracy and good precision (1 Mark)

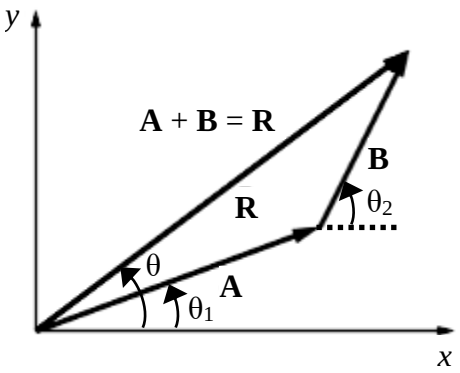
II. Good accuracy and good precision (1 Mark)

III. Good accuracy and poor precision (1 Mark)

(**Note**: Label the number I, II or III of the selected option in the given boxes.)

Q.2. (Total 2 Marks)

The given diagram shows the resultant vector **R** of two vectors **A** and **B**.



Write the formula for each of the following.

a. Magnitude of the vector **A** (1 Mark)

b. Direction of the resultant vector **R** (1 Mark)

Q.3. (Total 3 Marks)

A missile is fired with a velocity of 450 m/s at an angle of 45° with the horizontal axis.

(**Note**: Take the acceleration due to gravity as 10 m/s^2.)

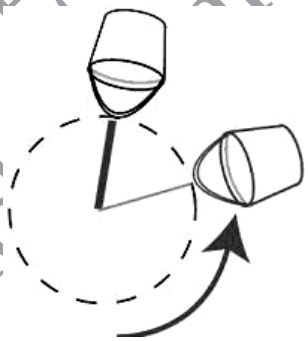
Calculate

a. the range of the projectile. (2 Marks)

b. the time for which the missile will remain in the air. (1 Mark)

Q.4. (Total 2 Marks)

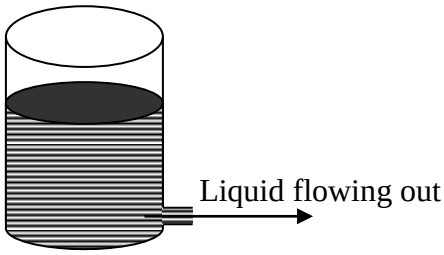
A water filled bucket is spinning with the help of a rope as shown in the given figure.



Explain why the water does not fall when the bucket spins around in a circle with a swift speed.

Q.5. (Total 3 Marks)

The given figure shows liquid flowing out from the bottom of a storage tank with a constant velocity.



Find an equation for the hydrostatic pressure at the bottom of the tank.

Q.6. (Total 2 Marks)

If the length of a simple pendulum is 100 cm, then calculate its frequency.

(**Note**: Take the acceleration due to gravity 'g' as 10 m/s^2.)

Q.7. (Total 3 Marks)

Sound travels faster in warm air than in cold air.

Explain the given statement with the help of mathematical equations.

Q.8. (Total 3 Marks)

Interference fringes are produced on a screen 100 cm away from the slits. Calculate the wavelength of light in cm. If the

i. fringe spacing is 5 mm.

ii. distance between slits is 0.5 mm.

Q.9. (Total 7 Marks)

EITHER

a. In a river, a man is propelling a boat upstream with the help of paddles.

If the boat comes to rest, while the man is still paddling, then explain whether work is being done or not. Give reason to your answer and support it with a mathematical equation. (7 Marks)

OR

b. Explain each statement by providing a valid reason.

i. A man can jump higher on the surface of the Moon than the Earth. (2 Marks)

ii. A man can run faster on the surface of the Earth than the Moon. (5 Marks)

Q.10. (Total 7 Marks)

EITHER

a. Why do we reduce pressure in the tyres of an automobile while driving on a motorway?

Write your answer in SEVEN points.

OR

b. More work is done when a gas is heated at constant pressure rather than at constant volume.

Justify the given statement in SEVEN points.

END OF PAPER

Please use this page for rough work