

**AGA KHAN UNIVERSITY EXAMINATION BOARD**

**SECONDARY SCHOOL CERTIFICATE**

**CLASS IX**

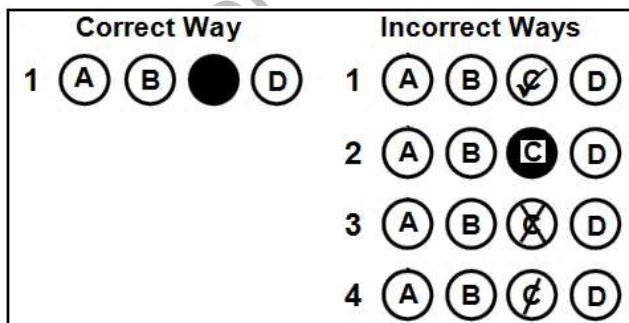
**ANNUAL EXAMINATIONS (THEORY) 2024**

**Physics Paper I**

**Time: 1 hour 10 minutes Marks: 40**

**INSTRUCTIONS**

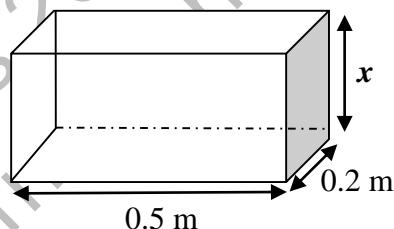
1. Read each question carefully.
2. Answer the questions on the separate answer sheet provided. DO NOT write your answers on the question paper.
3. There are 100 answer numbers on the answer sheet. Use answer numbers 1 to 40 only.
4. In each question there are four choices A, B, C, D. Choose ONE. On the answer grid black out the circle for your choice with a pencil as shown below.



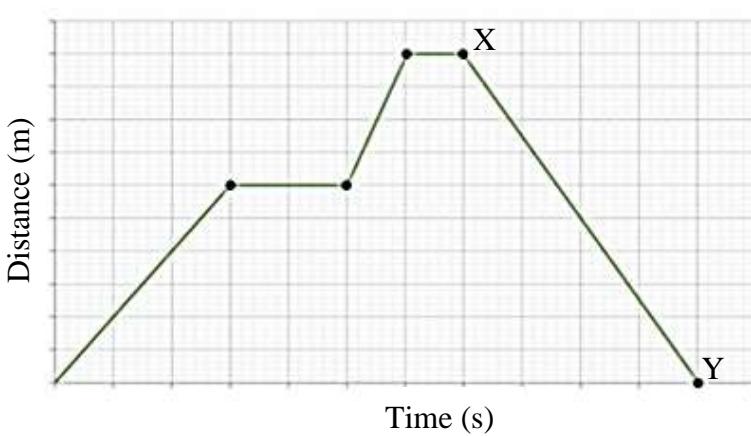
**Candidate's Signature**

5. If you want to change your answer, ERASE the first answer completely with a rubber, before blacking out a new circle.
6. DO NOT write anything in the answer grid. The computer only records what is in the circles.
7. You may use a simple calculator if you wish.

1. The total number of significant figures in 0.002022 are
  - A. 3
  - B. 4
  - C. 6
  - D. 7
2. The number 0.0000509 can be represented in scientific notation as
  - A.  $5.09 \times 10^5$
  - B.  $5.09 \times 10^3$
  - C.  $5.09 \times 10^{-3}$
  - D.  $5.09 \times 10^{-5}$
3. If the volume of the given cuboid is  $0.03 \text{ m}^3$ , then the value of  $x$  will be
  - A. 0.1 m.
  - B. 0.2 m.
  - C. 0.3 m.
  - D. 0.5 m.



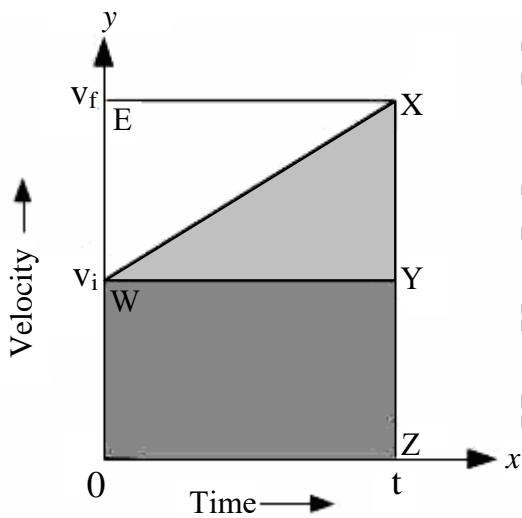
4. The total number of derived quantities involved in the equation  $S = v_i t + \frac{1}{2} a t^2$  is
  - A. one.
  - B. two.
  - C. three.
  - D. four.
5. The given graph depicts that a person is walking along a straight road.



Which of the following options CORRECTLY describes the motion of the person from point X to Y?

- A. The person is moving towards the starting point at a constant speed.
- B. The person is moving towards the starting point with a variable speed.
- C. The person is moving away from the starting point at a constant speed.
- D. The person is moving away from the starting point with a variable speed.

6. A force of 10 N is acting on a body along  $x$ -axis. The value of its  $y$ -component will be
- A. 0 N.
  - B. 5 N.
  - C. 10 N.
  - D. 20 N.
7. A body starts from rest and accelerates to a velocity of 100 m/s. If it covers a distance of 50 m, then its acceleration will be
- A.  $1 \text{ m/s}^2$ .
  - B.  $2 \text{ m/s}^2$ .
  - C.  $100 \text{ m/s}^2$ .
  - D.  $200 \text{ m/s}^2$ .
8. The below given picture shows the velocity-time graph for the motion of a body.



- The slope of the line segment WX in the above graph shows the
- A. acceleration.
  - B. displacement of the body.
  - C. total distance covered by the body.
  - D. total time taken for the motion of the body.
9. If a motorcyclist covers a displacement of 150 m in 10 s, then his/ her velocity will be
- A. 15 m/s.
  - B. 140 m/s.
  - C. 160 m/s.
  - D. 1500 m/s.

10. Saif and Kaif are in a basketball match. During the game, Saif, holding the ball of mass 0.6 kg running with a velocity of 3 m/s, collides with the defender, Kaif, who is at rest position, and both start moving together.



The type of collision and value of momentum of the ball will be

(Note: Saif and Kaif both have equal weights.)

	Type of Collision	Momentum of the Ball
A	Elastic	1.8 N.s
B	Inelastic	1.8 N.s
C	Elastic	0.2 N.s
D	Inelastic	0.2 N.s

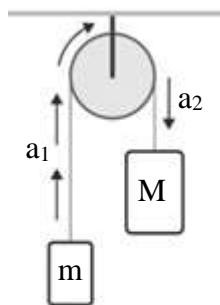
11. Which of the following options CORRECTLY depicts the effect of friction on the speed of an object while keeping the force constant?

	Friction	Speed
A	More	Less
B	Unaffected	Less
C	Less	More
D	Less	Unaffected

12. Two unequal masses are suspended with an inextensible string around a pulley as shown in the given diagram.

(Note: Here masses are ‘m’ and ‘M’, such that ‘m’ is less than ‘M’.)

Based on the given diagram, the relationship between the magnitudes of the acceleration  $a_1$  and  $a_2$  is



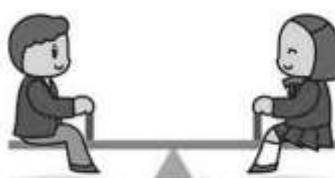
- A.  $a_1 = a_2 \neq 0$
  - B.  $a_1 > a_2$
  - C.  $a_1 < a_2$
  - D.  $a_1 = a_2 = 0$
13. During accidents, airbags in cars protect the passengers from hitting the dashboards by increasing the
- A. momentum.
  - B. acceleration.
  - C. time of contact.
  - D. impact of collision.
14. If the mass of an object is 0.7 kg, then its weight will be

(Note: Take the value of acceleration due to gravity ‘g’ as  $10 \text{ m/s}^2$ .)

- A. 0.07 N.
- B. 0.7 N.
- C. 7.0 N.
- D. 70.0 N.

15. Based on the given image, the net torque of the seesaw will be equal to

- A. zero.
- B. one.
- C. two.
- D. infinite.



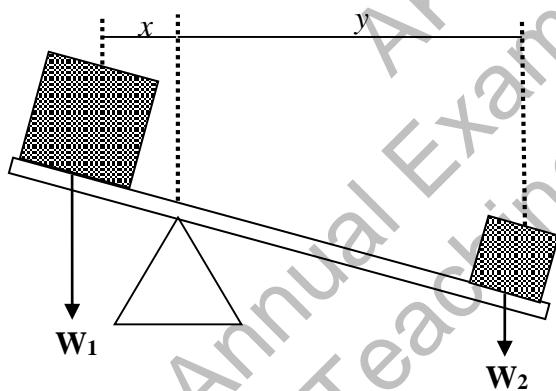
16. If a body obeys the first condition of equilibrium, then which of the following options will equate to zero?

- I. Linear acceleration
  - II. Vector sum of all the forces
  - III. Vector sum of all the torques
- A. II only
  - B. III only
  - C. I and II
  - D. II and III

17. If a force of 4 N is applied by a student on a door handle and the moment of force is 16 Nm, then the distance of the pivot from the point of applied force is

- A. 4 m.
- B. 12 m.
- C. 20 m.
- D. 64 m.

18. In the given diagram, two weights ' $W_1$ ' and ' $W_2$ ' are placed on a rod whereas ( $W_1 > W_2$ ). For keeping the rod in the equilibrium position, than



- I. increase ' $W_2$ ' and decrease ' $x$ '
  - II. increase ' $W_2$ ' and ' $x$ ' remain same
  - III. increase ' $x$ ' and ' $W_2$ ' remain the same
- A. I only.
  - B. III only.
  - C. I and II.
  - D. II and III.

19. A mountaineer has taken a bag of emergency items on his back to the Mount Everest.

On reaching the peak of the Mount Everest, the weight of the bag will

- A. increase.
- B. decrease.
- C. become zero.
- D. remain the same.

20. If two metallic spheres have an equal mass of 10 kg each and the distance between their centres is 0.5 m, then the gravitational force of attraction between the spheres will be

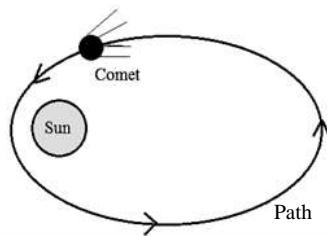
(Note: The value of the Gravitational constant is  $6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$ .)

- A.  $6.670 \times 10^{-9} \text{ N}$ .
- B.  $1.334 \times 10^{-9} \text{ N}$ .
- C.  $2.668 \times 10^{-4} \text{ N}$ .
- D.  $2.668 \times 10^{-8} \text{ N}$ .

21. The weight is a force that results from the gravitational attraction between an object and the Earth. The direction of this force will be

- A. upward.
- B. forward.
- C. backward.
- D. downward.

22. The given diagram shows the path followed by a comet when it reaches close to the sun. The shape of the path is



- A. elliptical.
- B. spherical.
- C. parabolic.
- D. hyperbolic.

23. If the kinetic energy of a 200 kg object is 10,000 J, then the velocity of the object will be

- A. 5.0 m/s.
- B. 7.07 m/s.
- C. 10.0 m/s.
- D. 100.0 m/s.

24. A tugboat applies a force of 100 N to tow a container ship from the shore to the deep sea. The rope that connects the tugboat to the ship is parallel to the surface of the water.

If the tugboat displaces the container ship by 500 m, then the amount of work done by the tugboat will be

(Note: Suppose that the seawater current is negligible.)

- A. 5 J.
- B. 400 J.
- C. 600 J.
- D. 50000 J.

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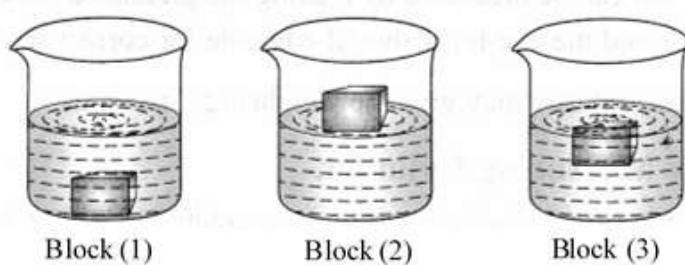
25. Consider the given image.



All of the following types of renewable energy sources are shown in the given picture EXCEPT

- A. solar.
  - B. wind.
  - C. hydel.
  - D. biomass.
26. An electric heater of 500 W consumes 50 J of energy to warm a room. The time required by the heater to warm the room will be
- A. 0.1 s.
  - B. 10 s.
  - C. 550 s.
  - D. 25000 s.
27. If a person exerts a force that causes a car to move forward, then this is an example of
- A. power.
  - B. efficiency.
  - C. work done.
  - D. rotatory motion.
28. According to the kinetic molecular theory of matter, the distance among the molecules of matter in the liquid state is
- A. equal to solid state.
  - B. more than solid state.
  - C. equal to gaseous state.
  - D. more than gaseous state.

29. The given diagram shows three different blocks of insoluble material placed in three beakers that are partially filled with water.



Which of the given block(s) is/ are LESS denser than water?

- A. Block (1) only
  - B. Block (2) only
  - C. Block (1) and Block (3)
  - D. Block (2) and Block (3)
30. When the upthrust on a moving cargo ship becomes equal to its weight, then it will
- A. sink.
  - B. float.
  - C. drop its load.
  - D. lose its balance.
31. Which of the following options depicts the atmospheric pressure at sea level and on the mountain?
- |   | Atmospheric Pressure at Sea Level | Atmospheric Pressure on the Mountain |
|---|-----------------------------------|--------------------------------------|
| A | Low                               | High                                 |
| B | Low                               | Low                                  |
| C | High                              | High                                 |
| D | High                              | Low                                  |
32. The property of matter by which it restores its length, shape or volume after the removal of the deforming force is called
- A. strain.
  - B. stress.
  - C. elasticity.
  - D. elastic limit.
33. The CORRECT relation between Celsius and Fahrenheit is
- A.  $1^{\circ}\text{C} > 1^{\circ}\text{F}$ .
  - B.  $1^{\circ}\text{C} < -32^{\circ}\text{F}$ .
  - C.  $-32^{\circ}\text{C} > 1^{\circ}\text{F}$ .
  - D.  $32^{\circ}\text{C} < 32^{\circ}\text{F}$ .

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34. The amount of heat energy required to change a substance from solid into liquid state at its melting point without any change in its temperature is known as
- heat capacity.
  - latent heat of fusion.
  - specific heat capacity.
  - latent heat of vapourisation.
35. If the temperature of a substance is 20°C, then its temperature in Kelvin scale will be
- 253 K.
  - 6.66 K.
  - 68 K.
  - 293 K.
36. A metal cap on a glass bottle can easily be opened when hot water is poured over it. This is because
- metal and glass do not expand.
  - metal and glass expand equally.
  - metal expands less and glass expands more.
  - metal expands more and glass expands less.
37. With reference to heat transfer in solids, the CORRECT statement is that heat
- flows from lower to higher temperature.
  - flows from higher to lower temperature.
  - is independent of the size of the surface of solids.
  - is independent of the temperature of the surroundings.
38. The CORRECT option that identifies the processes of heat transfer in which medium is required and not required is

	<b>Process in which Medium is Required</b>	<b>Process in which Medium is NOT Required</b>
A	conduction	convection
B	convection	conduction
C	conduction	radiation
D	radiation	conduction

39. An example of a good conductor of heat is a
- glass door.
  - frying pan.
  - wooden door.
  - leather jacket.

40. Air ventilation in a room is an example of

- A. radiation.
- B. convection.
- C. conduction.
- D. evaporation.

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