**AGA KHAN UNIVERSITY EXAMINATION BOARD**

**HIGHER SECONDARY SCHOOL CERTIFICATE**

**CLASS XI**

**MODEL EXAMINATION PAPER 2018**

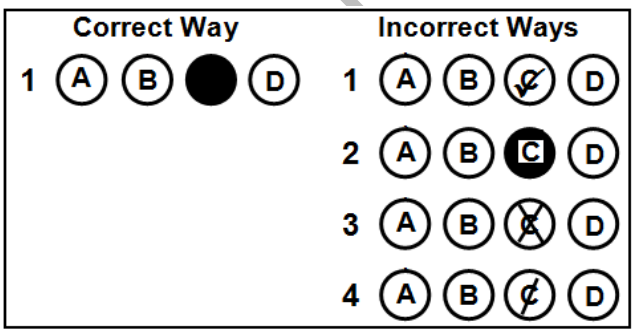
**Physics Paper I**

**Time: 50 minutes Marks: 35**



**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 35 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 scientific calculator if you wish.

1. The length of a metallic rod is recorded as $8.50 \times 10^5$ m.

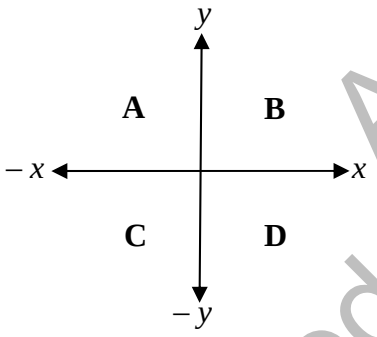
   The numbers of significant figures in the given measurement are

   A. three.
   B. four.
   C. five.
   D. six.

2. Which of the following shows the CORRECT dimensions of velocity, force and momentum?

| | **Velocity** | **Force** | **Momentum** |
|---|---|---|---|
| A | $LT^{-1}$ | $MLT^{-2}$ | $MLT^{-1}$ |
| B | $MLT^{-2}$ | $LT^{-1}$ | $LT^{2}$ |
| C | $LT^{-1}$ | $LT^{-1}$ | $MLT^{-2}$ |
| D | $MLT^{-2}$ | $MLT^{2}$ | $LT$ |

3. $\mathbf{R_x}$ and $\mathbf{R_y}$, are components of a vector **R**. If $\mathbf{R_x}$ is positive and $\mathbf{R_y}$ is negative, then the quadrant in which vector **R** lies is




4. If the magnitude of a force is 10 N, then the magnitude of its rectangular components will be

   A. 2 N and 8 N.
   B. 4 N and 7 N.
   C. 5 N and 5 N.
   D. 6 N and 8 N.

5. The vector product of two unit vectors $\hat{j}$ and $\hat{i}$, which are perpendicular to each other, is

   A. 0
   B. 1
   C. $-\hat{k}$
   D. $\hat{k}$

6. Torque is applied in all of the following cases EXCEPT

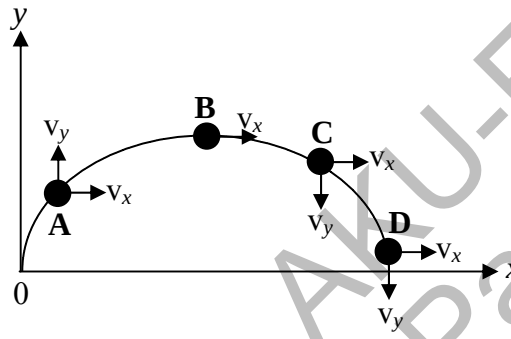
   A. tightening of a screw.
   B. rotating the key of a toy.
   C. turning a pencil in a sharpener.
   D. dragging a body on a level road.

7. A body is said to be in equilibrium if the vector sum of all the torques acting on it becomes

   A. zero.
   B. unity.
   C. two times.
   D. three times.

8. The given diagram shows the projectile motion of a ball.

   The magnitude of the vertical component of velocity (v) will be maximum at point




9. The horizontal range of a projectile is maximum at an angle of

   A. 0°
   B. 30°
   C. 45°
   D. 60°

10. The projectile motion is a good example of

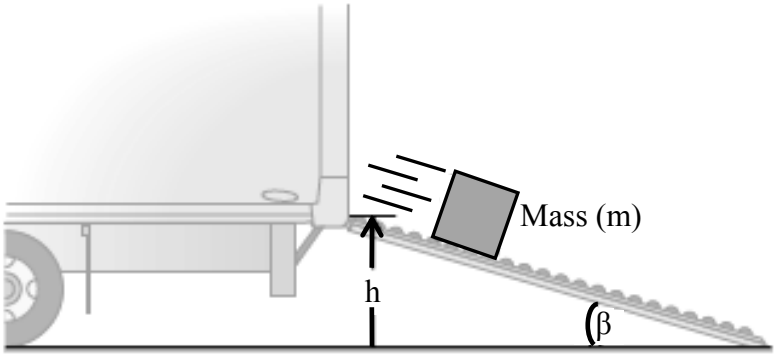
    A. one-dimensional motion.
    B. two-dimensional motion.
    C. three-dimensional motion.
    D. four-dimensional motion.

11. If a projectile is fired with the initial velocity of 90 m/s to hit a ground level target, then its maximum possible horizontal range will be

    (**Note**: The value of "g" is 9.8 m/s$^2$ and air resistance is negligible.)

    A. 1.1 m
    B. 9.2 m
    C. $8.3 \times 10^2$ m
    D. $8.8 \times 10^2$ m

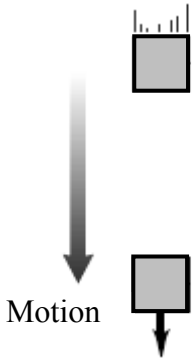
12. A packet of mass (m) is unloaded from a truck by using an inclined plane of a height (h) as shown in the given figure.




If friction is negligible, then the kinetic energy of the packet when it reaches the ground will be equal to

A. $\frac{1}{2}mgh$
B. $mgh$
C. $2mv^2$
D. $mv^2$

13. An object experiences a free fall motion as shown in the given figure.



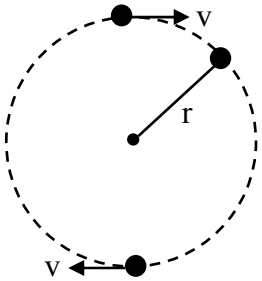

Which of the following is TRUE with respect to the work done **W** by the gravitational force and the object's gravitational potential energy **U**?

| | **W** | **U** |
|---|---|---|
| A | Positive | Decreases |
| B | Negative | Decreases |
| C | Negative | Increases |
| D | Positive | Increases |

14. The velocity which keeps a satellite in its orbit is known as

A. escape velocity.
B. critical velocity.
C. angular velocity.
D. artificial velocity.

15. In the given diagram, an object is rotating with a speed which is increasing. The angular acceleration of the object is in the same direction as its

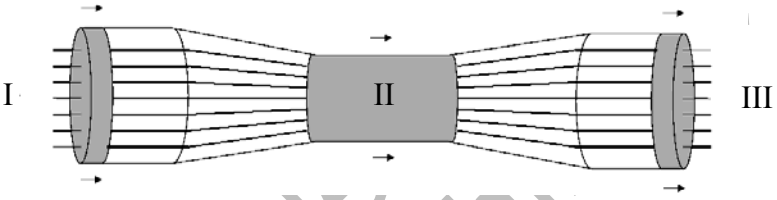



A. angular velocity.
B. tangential velocity.
C. linear displacement.
D. radial displacement.

16. Which of the following is used to obtain a smooth motion?

A. Ripples
B. Upthrust
C. Turbulent
D. Streamline

17. At which cross sectional area(s) of the given pipe, the water flow is fastest?

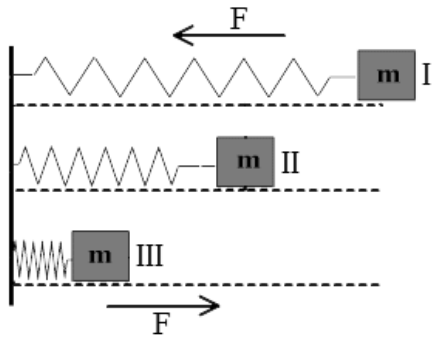



A. I only
B. II only
C. I and II
D. I and III

18. Which of the following is NOT obeyed by an ideal fluid?

A. Stoke's law
B. Torricelli's theorem
C. Bernoulli's equation
D. Equation of continuity

19. In the given mass-spring system, the potential energy of the block is zero at position(s)




A. I only
B. II only
C. I and III
D. II and III

20. If a body is executing simple harmonic motion (SHM), then the total energy of the body is directly proportional to the

A. amplitude.
B. square of the amplitude.
C. reciprocal of the amplitude.
D. square root of the amplitude.

21. Resonance is a phenomenon in which a vibrating system or external force drives another system to oscillate with greater amplitude at specific frequencies.

This phenomenon helps in determining the

A. forced vibration.
B. natural frequency.
C. energy dissipation.
D. amplitude of a vibrating body.

22. Which of the following factors affects the speed of sound in air?

I. Density
II. Pressure
III. Temperature

A. I only
B. II only
C. I and III
D. II and III

23. In the phenomenon of Doppler's effect, when a source of sound moves towards a stationary listener, it results in a decrease of the

A. pitch of sound.
B. velocity of sound.
C. frequency of sound.
D. wavelength of sound.

24. All of the following phenomena are exhibited by longitudinal waves, EXCEPT

A. refraction.
B. diffraction.
C. interference.
D. polarisation.

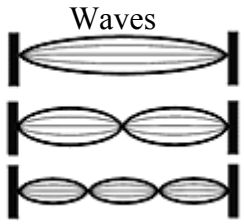
25. The resultant displacement at any point due to the sum of displacements of two or more waves is called

A. interference.
B. Doppler's effect.
C. Huygen's principle.
D. principle of superposition.

26. The place where compressions of one wave combines with the rarefactions of another wave, and both cancel each other is called a

A. null point.
B. dead beat.
C. node point.
D. zero point.

27. In the given diagram, the frequency of waves will be




Stretched String Vibration

A. equal in all cases.
B. the greatest in one loop.
C. the greatest in two loops.
D. the greatest in three loops.

28. According to Huygen's principle, light travels in the form of

I. photons
II. corpuscles
III. wavefronts

A. I only.
B. III only.
C. I and II.
D. II and III.

29. When a visible light ray passes through a small opening of a narrow slit, the longer wavelength, as compared to shorter wavelength of the light ray will

A. reflect less.
B. diffract less.
C. reflect more.
D. diffract more.

30. According to Boyle's law, pressure is inversely proportional to volume of a gas at constant

I. mass
II. density
III. temperature

A. I only.
B. III only.
C. I and II.
D. II and III.

31. A thermodynamics process in which an ice cube starts melting and converts into water droplets while keeping the temperature of its surrounding constant is called an

A. isobaric process.
B. isochoric process.
C. adiabatic process.
D. isothermal process.

32. According to the 2nd law of thermodynamics, heat can be converted into mechanical work if the system contains

A. two heat reservoirs at the same temperature.
B. two heat reservoirs at different temperatures.
C. an engine and a heat reservoir at the same temperature.
D. an engine and two heat reservoirs at different temperatures.

33. A Carnot heat engine is an engine that operates on the reversible Carnot cycle.

Its efficiency depends upon the temperature of

A. the surrounding.
B. the hot reservoir only.
C. the cold reservoir only.
D. both hot and cold reservoirs.

34. In an irreversible process of a thermodynamics system, there is

A. a loss of heat.
B. a decrease in volume.
C. an increase in pressure.
D. no change in temperature.

35. If a gas is heated in a closed system, then the quantity which remains unchanged would be the

A. mass.
B. volume.
C. pressure.
D. temperature.



END OF PAPER

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