Step Academy official

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STUDENT NAME			CLASS	New 1st Year (FSC/ICS)
PAPER CODE	11059		SUBJECT	Physics
TIME ALLOWED	85		TOTAL MARKS	180
Paper Date	21-02-2026		Paper Type	

Q1.   **Choose the correct answer.**   17X1=17

1. If a scale always read 2 kg. heavier that the actual value, the measurements are:

(A) Precise but not accurate   **(B)** Accurate but not precise   **(C)** Both Precise and accurate   **(D)** Neither precise nor accurate

2. Dot product of two antiparallel vectors A and B is:

(A) Ab cos   **(B)** AB   **(C)** 0   **(D)** -AB

3. The vector product (AxA) is:

(A) 2   **(B)** 1   **(C)** A   **(D)** 0

4. The cross product of a vector A with itself has the magnitude:

(A) A   **(B)** 1   **(C)** A^2 **(D)** Zero

5. Two masses m_1 and m_2 will interchange their velocities after collision if:

(A) $m_1 >> m_2$ **(B)** $m_1 = m_2$ **(C)** $m_2 >> m_1$ **(D)** m_2 is at rest

6. 60° is equal to:

(A) $\dfrac{\pi}{8}$ **(B)** $\dfrac{\pi}{6}$ **(C)** $\dfrac{\pi}{5}$ **(D)** $\dfrac{\pi}{3}$

7. A body is rotated in a vertical circle by a string. The tension in the string is minimum at the:

(A) Top   **(B)** Bottom   **(C)** Mid-position between top and bottom   **(D)** Remains same

8. A body of mass 8 kg moves along a circle of radius 4m with a constant speed of 8 ms^{-1}, the centripetal force on the body is:

(A) 48 N   **(B)** 8 N   **(C)** 18 N   **(D)** 128 N

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10. Centripetal acceleration is also called:

(A) Tangential acceleration   **(B)** Radial acceleration   **(C)** angular acceleration   **(D)** Rotational acceleration

11. The time period of a low flying satellite is:

(A) 1 year   **(B)** 84 minutes   **(C)** 28 hours   **(D)** 1 day

12. The dimensions of work are:

(A) $[MLT^{-1}]$ **(B)** $[MLT^{-2}]$ **(C)** $[ML^2T^{-2}]$ **(D)** $[MLT]$

13.
The height above the ground of a child on a swing varies from 0.5 m of his lower point to 1.5 m at his highest point. The maximum speed of the child is approximately:

(A) 1.5 ms^{-1} **(B)** 4.4 ms^{-1} **(C)** 9.8 ms^{-1} **(D)** Depends upon child's mass

14. Which heavenly body had maximum escape velocity:

(A) Moon   **(B)** mercury   **(C)** Mars   **(D)** Earth

15. The product of cross-sectional area of pipe and fluid speed along a pipe always:

(A) Zero   **(B)** Variable   **(C)** Constant   **(D)** None

16. When a fluid is incompressible, the quantity which is constant is:

(A) Mass   **(B)** Density   **(C)** Pressure   **(D)** Force

17. Boyle's law is applicable to:

(A) Isobaric process   **(B)** Isochoric process   **(C)** Isothermal process   **(D)** Adiabatic process

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Q2. **Write short answers of the following questions. Any 8**   **8X2=16**

1 . How many significant figures should be retained in the following?

2 . Can a measurement be precise but not accurate?

3 . How can precision be improved?

4 . What is absolute uncertainty?

5 . Why is it important to report uncertainty in measurements?

6 . Kinetic energy of a body of mass m moving with speed v is given by $1/2\, mv^2$. What are the dimensions of the kinetic energy?

7 . Differentiate between dimensional and non-dimensional variables.

8 . State right hand rule for two vectors with reference to vector products?

9 . Find the change in momentum for an object to a given force for a given time and state law of motion in terms of momentum.

10 . How would you elaborate the importance of head rest of car seat?

11 . What is uncertainty in measurement?

12 . Define impulse and show that how it is related to linear momentum?

Q3. **Write short answers of the following questions. Any 8**   **8X2=16**

1 . What causes angular acceleration in a rotating object?

2 . What are the benefits of using rear wheels of heavy vehicles consisted of double tyres?

3 . Why is the acceleration of a body moving uniformly in a circle, directed towards the centre?

4 . Can gravity acts as a centripetal force?

5 . How does altitude affect orbital velocity?

6 . What is meant by moment of inertia? Explain its significance.

7 . State the directions of the following vectors in simple situation; angular momentum and angular velocity.

8 . What is the work done by gravity when an object falls vertically downward?

9 . Convert 1.4kW into joule per second.

10 .

A light and heavy body have same linear momentum, which one has greater K.E?

11 . Can K.E be converted back into P.E?

12 . When a recket re-enters the atmosphere, its nose cone becomes very hot. Where does this heat energy come from?

Q4.   **Write short answers of the following questions. Any 6**   **6X2=12**

1 . State Bernoulli's equation for a liquid in motion and describe some of its applications.

2 . Explain the working of a carburetor of a motor car using by Bernoulli's principle.

3 . When water fall from a top, its cross sectional area decreases as it comes down. Explain.

4 . Explain how thermodynamics relates to the concept of energy conservation.

5 . Give two examples of adiabatic process.

6 . Is it possible to construct a heat engine that will not expel heat into the atmosphere?

7 . What is the effect on efficiency of Carnot engine, If the temperature of the sink only be decreased?

8 . What factors affect the coefficient of performance of a refrigerator?

9 . Explain briefly heat death of universe in terms of entropy.

Q5.   **Write detailed answers of the following questions. Any 6**   **6X4=24**

1 .
What is meant by signigicant figures? write two reasons for using them in measurements. How to find the uncertainty in a timing experiment such as the time period of a simple pendulum?

2 .
The length and width of a rectangular plate are measured to be 18.3 cm and 14.60 cm, respectively. Find the area of the plate and state the answer to correct number of significant figures.

3 . Define and explain scalar product. Write down its important characteristics.

4 .
A helicopter is ascending vertically at the rate of 19.6 m s^{-1}. When it is at a height of 156.8 m above the ground, a stone is dropped. How long does the stone take to reach the ground?

5 . Prove that (i) $v = r\omega$ (ii) $a = r\alpha$

6 .
A string 0.5 m long holding a stone can withstand maximum tension of 35.6 N, Find the maximum speed at which a stone of 0.5 kg mass can be whirled with it in a vertical circle.

7 . Define moment of inertia. Prove that torque acting on rotating rigid body is equal to the product of its moment of inertia and angular acceleration.

8 . A bicycle wheel has an angular momentum of 10 kg m^2 s^{-1} and angular velocity of 2 rad s^{-1} Find the value of its moment of inertia.

9 . State and explain work-energy theorem in a resistive medium.

10 . A 75 watt fan is used for 8 hours daily fro 30 day. Find: (i) Energy consumed in electrical units. (ii) Electricity bill if one unit costs Rs. 22.5?