MATHS

BOOKS - SURA MATHS (TAMIL ENGLISH)

SURAs MODEL QUESTION PAPER - 1

Part I

1. One ofi the combinations from the fundamental physical constants is $\frac{hc}{G}$. The

unit of this expression is

A. Kg^2

B. m^3

C. S^{-1}

D. m

Answer: A

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2. When a car takes a sudden left turn in the curved road passendgers are pushed towards the right due to

A. inertia of direction

B. inertia of motion

C. inertia of rest

D. absence of inertia

Answer: A

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3. Assertion : Parade of soldiers can be two dimension at or one dimensional

Reason : If the soldiers followed a straight line then it is one dimensional motion if they take a curved path after some time, that is an example for two dimensional motion.

A. Assertion and Reason are correct and Reason is correct explanation of Assertion

B. Assertion and Reason are true but Reason is the false explanation of the Assertion

C. Assertion is true but Reason is false

D. Assertion is false but Reason is true

Answer: A

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4. The work done by the Variable force is defined by_____

A. $\int_f^i F \times \overrightarrow{dv}$

B. $\int_f^i \overrightarrow{F} \times \overrightarrow{dr}$

C. $\int_i^f \overrightarrow{F} . \overrightarrow{dr}$

D. $\int_i^f \overrightarrow{dr} \times \overrightarrow{F}$

Answer: C

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5. The linear momentum and position vector of the planet is perpendicular to each other at

A. perihelion and aphelion

B. at all points

C. only at perihelion

D. no point

Answer: A

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6. Choose the odd one out

A. Work / time

B. Force x Velocity

C. 746 W

D. 1 kWh

Answer: D

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7. In hot summer after a bath, the body's

A. internal energy decreases

B. internal energy increases

C. heat decreases

D. no change in internal energy and heat

Answer: A

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8. A particle of mass m is moving with speed u in a direction which makes 60° with respect to x axis. It undergoes elastic collision with the wall. What is the change in momentum in x and y direction?

A. $\Delta P_x = -\mu, \Delta P_y = 0$

B. $\Delta P_x = -2\mu, \Delta P_y = 0$

C. $\Delta P_x = 0, \Delta P_y = \mathrm{mu}$

D. $\Delta P_x = \mu, \Delta P_y = 0$

Answer: A

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9. Choose the correct pair

A. Stoke's law - flotation of clouds

B. Hooke's law - Laminco flow

C. Reynold's number - stress - strain relation - ship

D. Terminal velocity - changing velocity

Answer: A

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10. A student tunes his guitar by striking a 120 Hertz with a tuning fork, and simultaneously plays the 4^{th} string on his guitar. By keen observation, he hears the amplitude of the combined sound oscillating thrice per second. Which of the following frequency is the most likely the frequency of the 4^{th} string on his guitar ?

A. 130

B. 117

C. 110

D. 120

Answer: B

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11. Choose the incorrect pair

A. Refrigerator - COP

B. Heat Engine - Sink

C. Carnot Engine · Ideal heat engine

D. First law of thermodynamics - Kelvin's statement

Answer: D

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12. Which one of the following statement is true?

A. A scalar quantity is conserved in a process

B. A scalar quantity does not vary from one point to another in space

C. A scalar quantity can never take -ve values

D. A scalar quantity has only magnitude and no direction.

Answer: D

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13. Physical independence of force is a consequence of

A. III law of motion

B. I law

C. II law

D. All

Answer: B

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14. (I) A Refrigerator is a reverse of carnot engine. (II) Carnot engine has lowest efficiency. Which one is correct statement?

A. I only

B. II only

C. Both are correct

D. None

Answer: A

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Part Ii

1. What is science?

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2. What is Kinematics?

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3. What is idea proposed by Aristotle and Galileo about force?

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4. Which unit is used to measure electrical energy?

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5. What is the relation between torque and angular momentum?

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6. Define the gravitational field. Give its unit.

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7. Define compressibility.

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8. What is meant by triple point of substance?

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9. Mention the different ways of increasing the number of molecular collision? Per unit time in a gas.

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10. What is meant by periodic motion? Give any two examples .

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Part Iii

1. What is meant by non-periodic motion? Give any two examples .

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2. Write down the types of waves.

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3. Briefly explain the types of physical quantities.

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4. Write a short note on vector product between two vectors.

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5. Explain the concept of inertia.

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6. Write two examples for inertia of motion

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7. Write two examples for inertia of rest

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8. Write two examples for inertia of direction.

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9. Define Coefficient of restitution

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10. Define Power

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11. Define Law of conservation of energy

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12. Define loss of kinetic energy in inelastic collision

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13. How do you distinguish between stable and unstable equilibrium?

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14. What is meant by superposition of gravitational field?

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15. Draw force-displacement graph for a spring and find an expression for the potential energy of an elastic spring.

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Part Iv

1. Explain the meaning of heat and work with suitable examples.

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2. Derive Meyer's relation.

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3. What is meant by simple harmonic oscillation? Give examples and explain why every simple harmonic motion is a periodic motion whereas the converse need not be true.

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4. Write any two applications of Bernoulli's Theorem

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5. Explain the use of screw gauge and vernier caliper in measuring smaller distances.

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6. Write a note on triangulation method and radar method to measure larger distances.

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7. Explain in detail the triangle law of addition.

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8. Write an explanation on Newton's laws.

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9. What is inelastic collision? In which way it is different from elastic collision. Mention few examples in day to day life for inelastic collision.

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10. Explain the types of equilibrium with suitable examples.

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11. Discuss the important features of the law of gravitation

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