PHYSICS

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PHYSICS (KANNADA ENGLISH)

ANNUAL EXAMINATION QUESTION PAPER (WITH ANSWERS) SOUTH -2017

Part A

1. Write the number of significant figures in 2.345.

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2. When the magnitude of the resultant of the two vectors is maximum?

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3. What does the area under the force-displacement curve represents?

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4. Define the term radius of gyration.

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5. What is the period of revolution of goestationary satellites?

6. State Hooke's law.

7. Why drops and bubbles are spherical in shape?

8. What is the significance of first law of thermodynamics?

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9. How does the kinetic energy of gas depend on its temperature?

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10. What are beats?

Part B

1. Mention any two basic forces in nature.

2. Write fundamental physical quantities in SI system.

3. State and explain the law of parallelogram of vector addition

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4. Define static friction and kinetic friction.

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5. Write the relation between acceleration due to gravity and universal gravitational constant and explain the terms.

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6. Distinguish between Stremline and turbulent flow of liquid.

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7. A particle takes 40s to make 20 oscillations. Calculate the time period and frequency of oscillation.

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8. At which position, the displacement of a particle in stationary wave is (i) maximum and (ii) minimum.

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1. Define relative velocity of an object w.r.t. another. Draw position-time graph of two objects moving along a straight line, when their relative velocity is (i) zero and (ii) non-zero.

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2. Derive the expression for centripetal acceleration.

3. Derive $\overrightarrow{F} = m\overrightarrow{a}$ where the symbols have their usual meanings.

4. What are elastic and inelastic collision? Give an example for elastic collision.

5. Draw Stress - Strain curve. Show Yield point and Fracture point.

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6. Explain molar specific heat of a gas at constant (i) pressure and (ii) volume. Write the relation between them in terms of gas constant.

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7. Define degrees of freedom. Write the number of degrees of freedom for (i) monoatomic gas and (ii) diatomic gas.

8. Why Newton's formula for speed of sound in gas fails? What is Laplace's correction? Write Newton Laplace formula for speed of sound in gas.

1. What is v-t graph? Derive the expression $x = V_0t + 1/2at^2$ using v-t graph.

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2. State the principle of conservation of mechanical energy and illustrate in the case of freely falling body.

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3. Write any five comparision between linear and rotational motion.

4. What is gravitational potential energy? Derive the expression for gravitation potential energy.

5. Explain any two types of expansions of solids with relavant equations. Write the SI uni of Co-efficient of expansion of solid.

6. Derive the expression for total energy of a particle executing simple harmonic motion (SHM).

7. The ceiling of a long hall is 20 m high. What is the maximum horizontal distance that a ball thrown with a speed of $40ms^{-1}$ can-go without hitting the ceiling of the hall? $(g = 10ms^{-1})$

8. A driver of car moving at $20ms^{-1}$ finds a child on the road 50 m ahead and stops the car 10 m earlier to the child. If the mass of the car with the driver is 1000 kg. Calculate the

force exerted by the breaks on the car and the time taken to stop the car.

9. A fly wheel of mass 10 kg and diameter 0.4 m rotating at 120 rpm has its speed increased to 720 rpm in 8 seconds. Find the torque acting on fly wheel.

10. The efficiency of carnot heat engine is 25%. When the temperature of the source alone is raised by 100K, the efficiency becomes 50%. Find the temperature of the source and the sink.

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11. A train at rest blows a whistle of frequency 600 Hz in still air. What is the frequency of whistle for a platform observer when the train.

(a) approaches the platform with a speed of $15ms^{-1}$ (b) recedes from the platform with a speed of 15 ms-l? What is the speed of sound in each case? Speed of sound in air is $345ms^{-1}$.

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