



PHYSICS

BOOKS - JEEVITH PUBLICATIONS

PHYSICS (KANNADA ENGLISH)

ANNUAL EXAMINATION QUESTION

PAPER WITH ANSWER NORTH 2019

Part A

1. How many kilograms in one unified atomic mass unit?



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2. State the law of triangle of addition of two vectors ?



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3. State Aristotle's fallacy.



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4. Name the type of energy stored in a stretched or compressed spring.



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5. Give an example for torque or moment of couple.



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6. Write the aim of Cavendish experiment in gravitation.



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7. How does strain depend on stress?



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8. Mention the value of steam point of water in Fahrenheit scale.



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9. Which quantity is kept constant in adiabatic process?



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10. The function $y = \log(\infty t)$. The displacement y increases monotonically with time t , is it periodic function or non-periodic function.



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Part B

1. Write any two fundamental forces is nature :



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2. Define accuracy in the measurement. How does accuracy depend on precision in the measurement.



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3. Distinguish between speed and velocity.



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4. State and explain Newton's first law of motion.



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5. Mention the relation between linear momentum and angular momentum with usual meanings.



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6. Write any two practical applications of Pascal's law.



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7. Write any three assumptions of Kinetic theory of an ideal gas



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8. How does period of oscillation of a pendulum depend on mass of the bob and length of the pendulum ?



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1. Deduce the expression for horizontal range of a projectile. For what angle of projection does horizontal range become maximum?



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2. State the laws of friction.



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3. Deduce the work-energy theorem for a constant force.



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4. Deduce the equations of motion of centre of mass.



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5. Name the three types of moduli of elasticity.



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6. What is capillary rise? Write the expression for height of capillary rise in the capillary tube with usual meanings.



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7. Obtain an expression for thermal stress.



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8. Show that specific heat capacity of a solid is equal to three times that of Gas constant ($C = 3R$)



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Part D

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 and illustrate the law of conservation of linear momentum for any two colliding particles in a closed system.



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3. State and explain parallel axis theorem and perpendicular axis theorem.



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4. State and explain the laws of thermal conductivity and hence mention the SI unit of coefficient of thermal conductivity.



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



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6. Discuss the mode of vibration of air columns in a closed pipe and hence define the fundamental frequency of vibration.



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7. A stone of mass 0.25 kg tied to the end of a string is whirled round in a circle of radius 1.5 m with a speed of 40 revolutions per minute in a horizontal plane. What is the tension in the spring?



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8. A pump on the ground floor of a building can pump up water to fill a tank of volume 30 m^3 in 15 min . If the tank is 40 m above the ground and efficiency of the pump is 30% . How much power is consumed by the pump ? (Density of water 10^3 kgm^{-3} , $g = 9.8 \text{ ms}^{-2}$) .



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9. If two spheres of equal masses with centres 0.2 m apart attract each other with a force of $1 \times 10^{-6} \text{ kgwt}$. What would be the value of their masses?

$$g = 9.8 \text{ ms}^{-2} \quad \text{and} \quad G = 6.67 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2}$$



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10. The sink in Carnot's heat engine is at 300K and the engine works at an efficiency 0.4. If the efficiency of the engine is to be increased to

0.5. Find by how many kelvin the temperature if the source should be increased.



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11. A train is moving at a speed of 72 kmph towards a station sounding a whistle of frequency 640Hz. What is the apparent frequency of the whistle as heard by a man standing on the platform when train approaches towards him.



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