

# Amrit Public School, Malan



**Class- 11(PCM)**

# **Holiday Homework**

Roll No.:.....

Name:.....

Class Teacher's Sign

Co-ordinator Sign

# Physics

1. A ball is dropped from the height  $h_1$  and if rebounds to a height  $h_2$ . Find the value of coefficient of restitution?
2. State and prove work energy theorem analytically?
3. An object of mass 0.4kg moving with a velocity of 4m/s collides with another object of mass 0.6kg moving in same direction with a velocity of 2m/s. If the collision is perfectly inelastic, what is the loss of K.E. due to impact?
4. A body of mass 2 kg initially at rest moves under the action of an applied horizontal force of 7 N on a table with coefficient of kinetic friction = 0.1. Compute the following: (a) Work done by the applied force in 10 s, (b) Work done by friction in 10 s, (c) Work done by the net force on the body in 10 s, (d) Change in kinetic energy of the body in 10 s, and interpret your results.
5. A trolley of mass 200 kg moves with a uniform speed of 36 km/h on a frictionless track. A child of mass 20 kg runs on the trolley from one end to the other (10 m away) with a speed of 4 m/s relative to the trolley in a direction opposite to the its motion, and jumps out of the trolley. What is the final speed of the trolley? How much has the trolley moved from the time the child begins to run?
6. A 1 kg block situated on a rough incline is connected to a spring of spring constant  $100 \text{ Nm}^{-1}$  as shown in Fig. 6.17. The block is released from rest with the spring in the unstretched position. The block moves 10 cm down the incline before coming to rest. Find the coefficient of friction between the block and the incline. Assume that the spring has a negligible mass and the pulley is frictionless.
7. A ball is dropped on a floor from a height of 2cm. After the collision, it rises up to a height of 1.5m. Assuming that 40% of mechanical energy lost goes to thermal energy into the ball. Calculate the rise in temperature of the ball in the collision. Specific heat capacity of the ball is  $800 \text{ J/k}$ . Take  $g = 10 \text{ m/s}^2$
8. A rain drop of radius 2 mm falls from a height of 500 m above the ground. It falls with decreasing acceleration (due to viscous resistance of the air) until at half its original height, it attains its maximum (terminal) speed, and moves with uniform speed thereafter. What is the work done by the gravitational force on the drop in the first and second half of its journey? What is the work done by the resistive force in the entire journey if its speed on reaching the ground is  $10 \text{ ms}^{-1}$ ?
9. Two identical ball bearings in contact with each other and resting on a frictionless table are hit head-on by another ball bearing of the same mass moving initially with a speed  $V$ . If the collision is elastic, which of the following figure is a possible result after collision?

# Chemistry

1. Define thermal energy.
2. What are the factors responsible for the strength of hydrogen bonds?
3. 50 cm<sup>3</sup> of hydrogen gas enclosed in a vessel maintained under a pressure of 1400 Tor, is allowed to expand to 125 cm<sup>3</sup> under constant temperature conditions. What would be its pressure?
4. Mention the two assumptions of kinetic theory of gases that do not hold good.
5. Why does viscosity of liquids decrease as the temperature is raised?
6. Calculate the pressure exerted by one mole of CO<sub>2</sub> at 273 K if the Vander waal's constant  $a = 3.592 \text{ dm}^6 \text{ at m mol}^{-1}$ . Assume that the volume occupied by CO<sub>2</sub> molecules is negligible
7. Explain how the function  $pV/RT$  can be used to show gases behave non-ideally at high pressure.
8. At 25°C and 760 mm of Hg pressure a gas occupies 600ml volume. What will be its pressure at a height where temperature is 10 °C and volume of the gas is 640 mL. Calculate the volume occupied by 5.0 g of acetylene gas at 500°C and 740mm pressure.
9. State the law depicting the volume-temperature relationship.
10. At what temperature will the volume of a gas at 0 °C double itself, pressure remaining constant?

# Mathematics

- Given that P(3,2,-4), Q(5,4,-6) and R(9,8,-10) are collinear. Find the ratio in which Q divides PR
- Determine the points in xy plane which is equidistant from these point A (2,0,3) B(0,3,2) and C(0,0,1)
- Show that the points A(0,1,2) B(2,-1,3) and C(1,-3,1) are vertices of an isosceles right angled triangle.
- Using section formula, prove that the three points A(-2,3,5), B(1,2,3), and C(7,0,-1) are collinear.
- Find the centroid of a triangle, mid points of whose sides are (1,2,-3), (3,0,1) and (-1,1,-4).
- Prove that the lines joining the vertices of a tetrahedron to the centroids of the opposite faces are concurrent.
- The mid points of the sides of a triangle are (1,5,-1), (0,4,-2) and (2,3,4). Find its vertices.
- Given that P(3,2,-4), Q(5,4,-6) and R(9,8,-10) are collinear. Find the ratio in which Q divides PR
- Determine the points in XY plane which is equidistant from these point A (2,0,3) B(0,3,2) and C(0,0,1)
- Find the locus of the point which is equidistant from the point A(0,2,3) and B(2,-2,1).

## हिंदी

- एकल परिवारों में बुजुर्गों की स्थिति विषय पर एक फीचर लिखें।
- नवभारत टाइम्स के संपादक को पत्र लिखकर बताए की लोग अपने वातावरण को स्वच्छ रखने की तरफ बिल्कुल ध्यान नहीं देते।

## Physical Education

- How many types of Awards?
- What is Narcotics?
- Explain any 3 Awards?
- What is the Importance of Blood?
- How many types of components? Explain all.

## Informatics Practices

Employee Name:	<input type="text"/>	
Basic Salary	: <input type="text"/>	<input type="radio"/> Teaching
D.A.	: <input type="text"/>	<input type="radio"/> Non-Teaching
H.R.A	: <input type="text"/>	<input type="text"/> PF
PF.	: <input type="text"/>	
Gross Salary	<input type="text"/>	
Net Salary	: <input type="text"/>	
<input type="button" value="Calculate"/>		<input type="button" value="Exit"/>
<input type="button" value="Clear"/>		

Calculation of DA, HRA& PF is based on the type of staff (Teaching and Non-Teaching) according to the following criteria:

Department	D.A.	H.R.A.	PF(Rs.)
Teaching	40% of Basic	10% of Basic	500/-
Non-teaching	30% of Basic	8% of Basic	400/-

Gross Salary is to be calculated as Basic + DA + HRA + PF

Net Salary is calculated as Gross Salary - PF

**S.** Write the code to make the text fields for DA, HRA, Gross Salary, PF and Net Salary uneditable.

(ii) When calculate button is clicked, the DA, HRA, Gross Salary, PF and Net Salary should be calculated as per the above given criteria and should be displayed in the respective text fields.

iii) Close the application when Exit button is clicked.





