Maharshi Patanjali Vidya Mandir

Holiday Home Work (2024-25)

Class - 11

Holiday Homework Physics Class 11

1. Complete the assignment sheet for the topic Dimensional Analysis

2. Complete the assignment sheet for the topic Vector Analysis.

6. Calculate the dimensions of force and impulse taking velocity, density and frequency as basic quantities. (**Ans.** $\rho v^4 \nu^{-2}, \rho v^4 \nu^{-3}$)

7. Find the dimensions of linear momentum and surface tension in terms of velocity v, density ρ and frequency ν as fundamental quantities.

   (**Ans.** $\rho v^4 \nu^{-3}, \rho v^3 \nu^{-1}$)

8. In the expression $P = El^2 m^{-5} G^{-2}$; E, m, l and G denote energy, mass angular momentum and gravitational constant, respectively. Show that P is a dimensionless quantity. [Exemplar Problem)

✺ PROBLEMS FOR PRACTICE

1. Convert one dyne into newton.   [Himachal 09]

   (**Ans.** 10^{-5} newton)

2. If the value of universal gravitational constant in SI is 6.6×10^{-11} $Nm^2 kg^{-2}$, then find its value in CGS system.   [Himachal 09]

   (**Ans.** 6.6×10^{-8} dyne $cm^2 g^{-2}$)

3. The density of mercury is 13.6 $g\, cm^{-3}$ in CGS system. Find its value in SI units.

   (**Ans.** 13.6×10^3 $kg\, m^{-3}$)

4. The surface tension of water is 72 dyne cm^{-1}. Express it in SI units.   (**Ans.** 0.072 Nm^{-1})

5. An electric bulb has a power of 500 W. Express it in CGS units.   (**Ans.** 5×10^9 erg s^{-1})

6. If the value of atmospheric pressure is 10^6 dyne cm^{-2}, find its value in SI units.   (**Ans.** 10^5 Nm^{-2})

7. In SI units, the value of Stefan's constant is $\sigma = 5.67 \times 10^{-8}$ $Js^{-1}\, m^{-2}\, K^{-4}$. Find its value in CGS system.   (**Ans.** 5.67×10^{-5} erg $s^{-1}\, cm^{-2}\, K^{-4}$)

8. Find the value of 100 J on a system which has 20 cm, 250 g and half minute as fundamental units of length, mass and time.   (**Ans.** 9×10^6 new units)

9. If the units of force, energy and velocity are 20 N, 200 J and 5 ms^{-1}, find the units of length, mass and time.   (**Ans.** 10 m, 8 kg, 2 s)

10. When 1 m, 1 kg and 1 min are taken as the fundamental units, the magnitude of the force is 36 units. What will be the value of this force in CGS system?

    (**Ans.** 10^3 dyne)

PROBLEMS FOR PRACTICE

1. Test the dimensional consistency of the following equations : (i) $v = u + at$ (ii) $s = ut + \frac{1}{2}at^2$
   (iii) $v^2 - u^2 = 2as$ [Himachal 07C]
   (Ans. All relations are dimensionally correct)

2. The viscous force 'F' acting on a small sphere of radius 'r' moving with velocity v through a liquid is given by $F = 6\pi\eta rv$. Calculate the dimensions of η, the coefficient of viscosity.   (Ans. $ML^{-1}T^{-1}$)

3. The distance covered by a particle in time t is given by $x = a + bt + ct^2 + dt^3$; find the dimensions of a, b, c and d.   (Ans. L, LT^{-1}, LT^{-2}, LT^{-3})

4. The critical velocity of the flow of a liquid through a pipe of radius r is given by $v_c = \dfrac{K\eta}{r\rho}$ where ρ is the

   density and η is the coefficient of viscosity of the liquid. Check if this relation is dimensionally correct.   (Ans. Correct)

5. The rate of flow (V) of a liquid flowing through a pipe of radius r and a pressure gradient (P/l) is given by Poiseuille's equation : $V = \dfrac{\pi}{8}\dfrac{Pr^4}{\eta l}$

   Check the dimensional consistency of this equation.
   (Ans. Correct)

6. Test if the following equation is dimensionally correct :
   $$h = \frac{2S\cos\theta}{r\rho g}$$
   where h = height, S = surface tension, ρ = density, r = radius, and g = acceleration due to gravity.
   (Ans. Correct)

11. A U-tube of uniform cross-section contains mercury upto a height h in either limb. The mercury in one limb is depressed a little and then released. Obtain an expression for the time period of oscillation assuming that T depends on h, ρ and g.

$$\left(\textbf{Ans.} \ T = K\sqrt{\dfrac{h}{g}}\right)$$

12. The critical angular velocity ω_c of a cylinder inside another cylinder containing a liquid at which its turbulence occurs depends on viscosity η, density ρ and the distance d between the walls of the cylinder. Find an expression for ω_c.

$$\left(\textbf{Ans.} \ \omega_c = \dfrac{K\eta}{\rho \, d^2}\right)$$

13. A body of mass m is moving in a circle of radius r with angular velocity ω. Find expression for centripetal force acting on it by the method of dimensions. **[Himachal 03, 09C]** (**Ans.** $F = Kmr\omega^2$)

14. Consider a simple pendulum. The period of oscillation of the simple pendulum depends on its length 'l' and acceleration due to gravity 'g'. Derive the expression for its period of oscillation by the method of dimensions. **[Himachal 06, 06C, 07]**

5. Calculate the angle between a 2 N force and a 3 N force so that their resultant is 4 N.   (**Ans.** 75°31′)

6. The resultant vector of $\vec{P}$ and $\vec{Q}$ is $\vec{R}$. On reversing the direction of $\vec{Q}$, the resultant vector becomes $\vec{S}$. Show that : $R^2 + S^2 = 2(P^2 + Q^2)$.

7. Two equal forces have the square of their resultant equal to three times their product. Find the angle between them.   (**Ans.** 60°)

8. When the angle between two vectors of equal magnitude is $2\pi/3$, prove that the magnitude of the resultant is equal to either.

9. At what angle do the two forces $(P + Q)$ and $(P - Q)$ act so that the resultant is $\sqrt{3P^2 + Q^2}$.   (**Ans.** 60°)

[Himachal 04]

✱ PROBLEMS FOR PRACTICE

1. If $\vec{A} = 3\hat{i} + 2\hat{j}$ and $\vec{B} = \hat{i} - 2\hat{j} + 3\hat{k}$, find the magnitudes of $\vec{A} + \vec{B}$ and $\vec{A} - \vec{B}$. [**Ans.** 5, $\sqrt{29}$]

2. Find the unit vector parallel to the resultant of the vectors $\vec{A} = 2\hat{i} - 6\hat{j} - 3\hat{k}$ and $\vec{B} = 4\hat{i} + 3\hat{j} - \hat{k}$.

   [**Ans.** $1/\sqrt{61}(6\hat{i} - 3\hat{j} - 4\hat{k})$]

3. Determine the vector which when added to the resultant of $\vec{A} = 2\hat{i} - 4\hat{j} - 6\hat{k}$ and $\vec{B} = 4\hat{i} + 3\hat{j} + 3\hat{k}$ gives the unit vector along z-axis. [**Ans.** $-6\hat{i} + \hat{j} + 4\hat{k}$]

4. Find the value of λ in the unit vector $0.4\hat{i} + 0.8\hat{j} + \lambda\hat{k}$.
   [**Ans.** $\sqrt{0.2}$]

5. Given three coplanar vectors $\vec{a} = 4\hat{i} - \hat{j}$, $\vec{b} = -3\hat{i} + 2\hat{j}$ and $\vec{c} = -3\hat{j}$. Find the magnitude of the sum of the three vectors. [**Ans.** $\sqrt{5}$]

Problems For Practice

1. Find the angle between the vectors $\vec{A} = \hat{i} + \hat{j} + \hat{k}$ and $\vec{B} = -\hat{i} - \hat{j} + 2\hat{k}$. (Ans. 90°)

2. Find the value of λ so that the vectors $\vec{A} = 2\hat{i} + \lambda\hat{j} + \hat{k}$ and $\vec{B} = 4\hat{i} - 2\hat{j} - 2\hat{k}$ are perpendicular to each other. (Ans. $\lambda = 3$)

3. For what value of m, is the vector $\vec{A} = 2\hat{i} + 3\hat{j} - 6\hat{k}$ perpendicular to the vector $\vec{B} = 3\hat{i} - m\hat{j} + 6\hat{k}$? [Delhi 16] (Ans. −10)

4. For what value of a are the vectors $\vec{A} = a\hat{i} - 2\hat{j} + \hat{k}$ and $\vec{B} = 2a\hat{i} + a\hat{j} - 4\hat{k}$ perpendicular to each other ? (Ans. 2, − 1)

5. Find the angles between the following pairs of vectors :

(i) $\vec{A} = \hat{i} + \hat{j} + \hat{k}$ and $\vec{B} = -2\hat{i} - 2\hat{j} - 2\hat{k}$. (Ans. 180°)

(ii) $\vec{A} = -2\hat{i} + 2\hat{j} - \hat{k}$ and $\vec{B} = 3\hat{i} + 6\hat{j} + 2\hat{k}$ (Ans. 79°)

(iii) $\vec{A} = 2\hat{i} - 4\hat{j} + 6\hat{k}$ and $\vec{B} = 3\hat{i} + \hat{j} + 2\hat{k}$. [Central Schools 17] (Ans. 60°)

6. Calculate the values of (i) $\hat{j} \cdot (2\hat{i} - 3\hat{j} + \hat{k})$ and (ii) $(2\hat{i} - \hat{j}) \cdot (3\hat{i} + \hat{k})$. [Ans. (i) − 3 (ii) 6]

7. A force $\vec{F} = 4\hat{i} + \hat{j} + 3\hat{k}$ newton acts on a particle and displaces it through displacement $\vec{S} = 11\hat{i} + 11\hat{j} + 15\hat{k}$ metre. Calculate the work done by the force. (Ans. 100 J)

8. Under a force of $10\hat{i} - 3\hat{j} + 6\hat{k}$ newton, a body of mass 5 kg is displaced from the position $6\hat{i} + 5\hat{j} - 3\hat{k}$ to the position $10\hat{i} - 2\hat{j} + 7\hat{k}$. Calculate the work done. (Ans. 121 J)

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9. The sum and difference of two vectors $\vec{A}$ and $\vec{B}$ are $\vec{A} + \vec{B} = 2\hat{i} + 6\hat{j} + \hat{k}$ and $\vec{A} - \vec{B} = 4\hat{i} + 2\hat{j} - 11\hat{k}$. Find the magnitude of each vector and their scalar product $\vec{A} \cdot \vec{B}$. (Ans. $\sqrt{50}, \sqrt{41}, -25$)

10. A force $\vec{F} = 5\hat{i} + 4\hat{j}$ newton displaces a body through $\vec{S} = 3\hat{i} + 4\hat{k}$ metre in 3 s. Find the power. (Ans. 5 W)

Problems for Practice

1. If $\vec{A} = \hat{i} + 3\hat{j} + 2\hat{k}$ and $\vec{B} = 3\hat{i} + \hat{j} + 2\hat{k}$, then find the vector product $\vec{A} \times \vec{B}$.

    (Ans. $4\hat{i} + 4\hat{j} - 8\hat{k}$)

2. Prove that the vectors $\vec{A} = 4\hat{i} + 3\hat{j} + \hat{k}$ and $\vec{B} = 12\hat{i} + 9\hat{j} + 3\hat{k}$ are parallel to each other.

3. If $\vec{A} = 2\hat{i} + 3\hat{j} + \hat{k}$ and $\vec{B} = 3\hat{i} + 2\hat{j} + 4\hat{k}$, then find the value of $(\vec{A} + \vec{B}) \times (\vec{A} - \vec{B})$.

    (Ans. $-20\hat{i} + 10\hat{j} + 10\hat{k}$)

4. Find the value of a for which the vectors $3\hat{i} + 3\hat{j} + 9\hat{k}$ and $\hat{i} + a\hat{j} + 3\hat{k}$ are parallel.

    (Ans. $a = 1$)

5. Find a unit vector perpendicular to the vectors $\vec{A} = 4\hat{i} - \hat{j} + 3\hat{k}$ and $\vec{B} = -2\hat{i} + \hat{j} - 2\hat{k}$.

    [Ans. $\frac{1}{3}(-\hat{i} + 2\hat{j} + 2\hat{k})$]

6. Find the sine of the angle between the vectors $\vec{A} = 3\hat{i} - 4\hat{j} + 5\hat{k}$ and $\vec{B} = \hat{i} - \hat{j} + \hat{k}$.   (Ans. 1/5)

7. Find a vector of magnitude 18 which is perpendicular to both the vectors $4\hat{i} - \hat{j} + 3\hat{k}$ and $-2\hat{i} + \hat{j} - 2\hat{k}$.

    (Ans. $-6\hat{i} + 12\hat{j} + 12\hat{k}$)

8. Determine the area of the parallelogram whose adjacent sides are formed by the vectors $\vec{A} = \hat{i} - 3\hat{j} + \hat{k}$ and $\vec{B} = \hat{i} + \hat{j} + \hat{k}$.

    (Ans. $4\sqrt{2}$ square units)

9. Find the area of the triangle formed by points O, A and B such that $\vec{OA} = \hat{i} + 2\hat{j} + 3\hat{k}$ and $\vec{OB} = -3\hat{i} - 2\hat{j} + \hat{k}$.   (Ans. $3\sqrt{5}$ square units)

Holiday Homework : 2024-25
Subject : Chemistry
Class -11

(1) Revise the unit studied in the class.

(2) Do numericals from this unit to clear concepts.

(3) Complete your practical file which you have performed in the lab.

Holiday Home Work - 2024-25

Subject : Standard Mathematics
Class : 11

1. Solve 50 questions from the chapters covered till May-2024 and write 10 applications of the concepts of Set/ Venn diagram in day to day life.

2. Draw the graphs of Real functions.

3. Make a list of all formulae of the chapters covered in April and May-2024.

Holiday Home Work - 2024-25
Subject : Applied Mathematics
Class : 11

1. Solve 50 questions from the chapters covered till May 2024.

2. Make a list of all formulae of the chapters covered in April and May -2024.

3. Make a note of following topics : G.S.T. , VAT and the old Income Tax slab for Male/Female/Senior Citizens.

Holiday Homework : 2024-25
Subject: Computer Science
Class: XI

Note: The answers to all questions should be written neatly and properly only in the Theory Notebook.

Q.1. Describe the various advantages and disadvantages of Python as a Programming Language.

Q.2. Explain the difference between Script Mode and Interactive Mode of Python IDLE.

Q.3. Define the following terms with respect to Python Programming Language:

   i. Tokens   ii. Keywords   iii. Identifiers   iv. Literals   v. Operators

Q.4. Describe the different rules for creating Identifiers in Python.

Q.5. Explain the difference between a Python Variable and a Variable in other Programming Languages.

Q.6. Describe the following terms:

   i. Algorithm   ii. Flowchart   iii. Pseudocode   iv. Trace Tables

Q.7. Describe the characteristics of a good Algorithm.

Q.8. Write a program to enter two integers and perform all arithmetic operations on them.

Q.9. Write a program to calculate in how many days a work will be completed by three persons A, B and C together. A, B, C take x days, y days and z days respectively to do the job alone. The formula to calculate the number of days if they work together is xyz / (xy+yz+xz) days where x, y and z are given as input to the program.

Q.10. Write a program to swap two numbers using a third variable.

Holiday Homework - 2024-25

Subject: Information Practices

Class: XI

Note: The answers to all questions should be written neatly and properly only in the Theory Notebook.

Q.1. What is Pathon?

Q.2. Describe the various advantages and disadvantages of Python as a Programming Language.

Q.3. Explain the difference between Script Mode and Interactive Mode of Python IDLE.

Q.4. Define the following terms with respect to Python Programming Language:

   i. Tokens   ii. Keywords   iii. Identifiers   iv. Literals   v. Operators

Q.5. Describe the different rules for creating Identifiers in Python.

Q.6. Write the naming rules of identifier/Variables

Q.7. Differentiate between id() and type() function with an example.

Q.8. Write a program to enter two integers and perform all arithmetic operations on them.

Q.9. Write a program to swap two numbers using a third variable.

Q.10 Write a program to input age of a person and check whether she/he eligible for voting or not.

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(MICRO ECONOMICS)

1. CENTRAL PROBLEMS OF AN ECONOMY
2. THEORY OF CONSUMER EQUILIBRIUM AND UTILITY ANALYSIS.

Make notes of the topics and Questions covered in class with proper diagrams and Practicedoing Numericals related to the topic covered in class**)**

STATISTICS FOR ECONOMICS

1. Importance of Statistics in Economics. Various Concepts of Economics by Adam Smith, Robbins, Marshall, Samuelson etc. Definition of Statistics Importance and Limitations Distrust of Statistics etc.
2. Primary and Secondary Data and Census and Sample Methods.
   Make Notes of the topic covered in class and practice doing Questions given at the back of the chapter.

PROJECT WORK
SELECT ANY ONE OF THE TOPICS MENTIONED IN the SYLLABUS AND MAKE A BLUE PRINT..

HOLIDAY HOMEWORK : 2024-25
BUSINESS STUDIES
CLASS - 11

1. Nature and Sope of Business, Human Activities Classification into Economic and Non Economic. Role of Profit in business Objectives of Business Risks and its types. Industry and Trade Classification of Industries Auxiliaries to Trade etc.

2. Social Responsibility of Business among various Stakeholders like govt, employer employees shareholders etc.

Make notes of the topics and Questions covered in class and Practice doing back questionsrelated to the topic covered in class**.**

PROJECT WORK

SELECT ANY ONE OF THE TOPICS MENTIONED IN the SYLLABUS AND MAKE A BLUE PRINT.

HOLIDAY HOMEWORK : 2024-25
ACCOUNTANCY
CLASS - 11

1. Revise the concepts and Basic Accounting terms.
2. Memorise the Golden rules of accounting
3. Practice questions of accounting equation.
4. Difference between cash discount and trade discount.
5. Do 10 questions of journal entries.

Holiday Homework 2024-25
Legal Studies
Class - XI

1. Revise the chapters done in the class.

2. Read about the fundamental rights

3. Read the landmark cases. List is given in the class group.

Holiday Homework - 2024-25
Subject : Physical Education
Class - 11

1. Make a note of Chapter 1. (Incopy)

PROJECT WORK

Make the 400 meter track and mention all the measurements on the Chart Paper.

Holiday Homework - 2024-25
Subject : Biology
Class - 11

1. Revise the chapter done in the class.

2. Complete your assignment work.

3. Draw a well labelled diagram of a bacteriophage. Alsoexplain it's structure and functions.

4. Solve the NEET based MCQs given in the classroom.(Chapter 1 and 2)

Holiday Homework 2024 -25
Subject : Biotechnology
Class - 11

1. Revise the chapter done in the class.

2. Draw the diagram of:

    - Prokaryotic cell
    - Plant cell
    - Animal cell
    - Nerve cell
      (Do in the biotechnology copy)

3. Learn the scientists name with their contribution.

4. Make a chart (of one fourth size) on any topic from your NCERT book.

Holiday Homework : 2024-25

Subject : History

Class - XI

Make a project file decoratively covered, following the norms discussed earlier of about 20 pages on the topic chosen. The topic chosen should be relevant to the syllabus. Extra information's may be added. Matter can be collected from any authentic source.

Go through the portions covered in class.

1. Revise the chapters done in class.

2. Do the survey work given in the chapter 2 'Methods of Enquiry in Psychology'

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ग्रीष्मावकाश कार्य : 2024-25
विषय - हिंदी
कक्षा – 11

1- निम्नलिखित विषयों में से किसी एक विषय पर 150 शब्दों का एक सारगर्भित अनुच्छेद लिखिए -

क- वर्तमान समय में सोशल मीडिया का बढ़ता प्रभाव एवं आवश्यकता।
ख- देशप्रेम : उत्तरदायित्व एवं कर्तव्य
ग- युवाओं में बढ़ता असंतोष : कारण एवं निवारण

2- पढ़ाए गए सभी पाठों के प्रश्न उत्तरों को याद कीजिए।

3- व्याकरण पुस्तक अथवा सैंपल पेपर की सहायता से पढ़ाए गए सभी व्याकरणिक अंशों का अभ्यास कीजिए।

4 - परियोजना कार्य –

भक्तिकाल : हिंदी साहित्य का स्वर्णकाल

अथवा

किसी एक सुप्रसिद्ध साहित्यकार के कृतित्व एवं जीवन दर्शन की विवेचना ।

अथवा

पाठ्य पुस्तक पर आधारित किसी एक सामाजिक समस्या पर सीबीएसई के मानकों के आधार पर फाइल वर्क तैयार कीजिए।

'The Difficulty of Being Good'
(Gurcharan Das)

1. Read the novel given above thoroughly, and write the answers of the following
   questions on file papers:-

   Das delves into the complexities of ethical decision-making and the challenges
   individuals face in trying to lead a moral life.

a. How does the author use characters and events from the Mahabharata to
   illustrate the nuances of dharma and the dilemmas faced by the characters in the
   epic?   (150 words)

b. Write about your favourite character.   (100 words)

Q2. Read the novel 'The Mistress of Spices' by Chitra Banerjee for ASL.

Holiday Homework : 2024-25

Subject : General Studies

Class - XI

Write the projects discussed in class

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