SHREE VASISHTHA VIDHYALAYA
Diwali Assignment (2024 25)
STD-12 Science

Sr. No.	Subject	Topics
1.	English	**Note: Write in project paper and submit in separate file with Name, Class, Roll No & Subject.** **Literature** 1. Our language is part of our culture and we are proud of it. Describe how regretful M. Hamel and the village elders are for having neglected their native language, French. 2. 'Lost Spring' explains the grinding poverty and traditions that condemn thousands of people to a life of abject poverty. Do you agree? Why/Why not? 3. Desire, determination and diligence lead to success. Explain the value of these qualities in the light of Douglas' experience in "Deep Water". 4. Our scriptures tell us that determination and perseverance are cardinal virtues of a good human being. Raj Kumar Shukla succeeded in taking Gandhiji to Champaran with the help of these two. How can young students today use these two qualities to make successful careers for themselves? 5. What political significance does Gemini Studios' invitation to Moral Re-Armament army and Stephen Spender show? 6. Science has an aura of magic. Do you agree? Why? Why not? (Third Level) 7. The king was callous as a ruler and behaved whimsically. Thus, the people in his kingdom suffered while he fulfilled his desire of killing a hundred tigers. Do you find leaders or politicians in the world today being indifferent to the needs of the people and behaving in the same way? Comment with relevant examples. 8. Why does Tishani Doshi call her trip to Antarctica a "Journey to the End of the Earth"? What experience did she have during this expedition? 9. What conflicting ideas arise in Dr. Sadao's mind after he has brought the wounded American soldier home? How is the conflict resolved? 10. Do you think Derry's chance meeting with Mr Lamb would prove meaningful to him? Answer giving valid reasons. **Writing** 1. You are Secretary of the History Club of Vidya Mandir School. Draft a notice in not more than 50 words informing students of a proposed visit to some important historical sites in your city. 2. You are Srinivas / Srinidhi of D.P. Public School, Nagpur. As Student Editor of your school magazine, draft notice in not more than 50 words for your school notice board inviting article and sketches from students of all classes. 3. You are the Principal of Zodiac Senior Secondary School, Ooty. The school has completed 25 years of its meritorious services to the society. The Silver Jubilee Celebrations are to be held on Sunday, the 26th October, 20XX. Mrs M. Kamath, the founder Principal will preside. Draft a suitable invitation to be sent to important dignitaries of the city and the parents of students. 4. Highlight the importance of proper garbage disposal with an aim to create awareness among the city residents. Write a letter regarding the same to the editor of a local daily Hindustan Times. You are Rubal of Shakti Nagar, Delhi. 5. Recent floods in many metropolitan cities of the country during the monsoon season laid bare the hollowness of the claims of the civic authorities of their

preparedness. The poor had to bear the brunt of the problem while no one was ever held accountable. Write an article in 150 – 200 words on the common man's woes during the monsoons and the need for accountability of the officials concerned. You are Sumit / Smita Verma.

6. India is a land of diversity. One way in which it makes us feel proud of it is the number of festivals we enjoy. Write an article in 150-200 words on 'Festivals of India'. You are Karuna / Karan.

| 2. | Physics | **Solve the following in exercise/ paper solution notebook.** |

1. Work sheet of competency based questions of all chapters.
2. Solve sample paper 1 and 2
3. Thoroughly revise all chapters
4. Complete journal and investigatory project.

| 3. | Chemistry | **Solve the following worksheet in exercise notebook:** |

1. Calculate the mass percentage of aspirin ($C_9H_8O_4$) in acetonitrile (CH_3CN) when 6.5 g of $C_9H_8O_4$ is dissolved in 450 g of CH_3CN.
2. Give an example of a solid solution in which the solute is a gas.
3. Two elements A and B form compounds having formula AB_2 and AB_4. When dissolved in 20 g of benzene (C_6H_6), 1 g of AB_2 lowers the freezing point by 2.3 K whereas 1.0 g of AB_4 lowers it by 1.3 K. The molar depression constant for benzene is 5.1 K kg mol^{-1}. Calculate atomic masses of A and B.
4. The air is a mixture of a number of gases. The major components are oxygen and nitrogen with approximate proportion of 20% is to 79% by volume at 298 K. The water is in equilibrium with air at a pressure of 10 atm. At 298 K if the Henry's law constants for oxygen and nitrogen are 3.30×10^7 mm and 6.51×10^7 mm respectively, calculate the composition of these gases in water.
5. Determine the osmotic pressure of a solution prepared by dissolving 25 mg of K_2SO_4 in 2 litre of water at 25° C, assuming that it is completely dissociated.
6. The conductivity of 0.20 M solution of KCl at 298 K is 0.0248 S cm^{-1}. Calculate its molar conductivity.
7. The resistance of a conductivity cell containing 0.001M KCl solution at 298 K is 1500. What is the cell constant if conductivity of 0.001M KCl solution at 298 K is 0.146×10^{-3} S cm^{-1}?
8. A solution of $Ni(NO_3)_2$ is electrolyzed between platinum electrodes using a current of 5 amperes for 20 minutes. What mass of Ni is deposited at the cathode?
9. Three electrolytic cells A, B, C containing solutions of $ZnSO_4$, $AgNO_3$ and $CuSO_4$, respectively are connected in series. A steady current of 1.5 amperes was passed through them until 1.45 g of silver deposited at the cathode of cell B. How long did the current flow? What mass of copper and zinc were deposited?
10. Conductivity of 0.00241 M acetic acid is 7.896×10^{-5} S cm^{-1}. Calculate its molar conductivity and if Λ_m^0 for acetic acid is 390.5 S cm^2 mol^{-1}, what is its dissociation constant?
11. The rate of a reaction quadruples when the temperature changes from 293 K to 313 K. Calculate the energy of activation of the reaction assuming that it does not change with temperature.
12. The rate constant for the decomposition of hydrocarbons is 2.418×10^{-5} s^{-1} at 546 K. If the energy of activation is 179.9 kJ/mol, what will be the value of pre-exponential factor?
13. A first order reaction takes 40 min for 30% decomposition. Calculate t1/2.
14. The rate constant for the first order decomposition of H2O2 is given by the following equation:
    log k = 14.34 – 1.25 × 10^4 K/T
    Calculate E_a for this reaction and at what temperature will its half-period be 256 minutes?
15. The time required for 10% completion of a first order reaction at 298 K is equal to that required for its 25% completion at 308 K. If the value of A is 4×10^{10} s^{-1}. Calculate k at 318 K and E_a.

		16. How will you bring about the following conversions?
		a. Ethanol to but-1-yne
		b. Ethane to bromoethene
		c. Propene to 1-nitropropane
		d. Toluene to benzyl alcohol
		e. Propene to propyne
		17. Primary alkyl halide C_4H_9Br (a) reacted with alcoholic KOH to give compound (b).Compound (b) is reacted with HBr to give (c) which is an isomer of (a). When (a) is reacted with sodium metal it gives compound (d), C_8H_{18} which is different from the compound formed when n-butyl bromide is reacted with sodium. Give the structural formula of (a) and write the equations for all the reactions.
		18. How is 1-propoxypropane synthesised from propan-1-ol? Write mechanism of this reaction.
		19. Write equations of the following reactions:
		(i) Friedel-Crafts reaction-alkylation of anisole.
		(ii) Nitration of anisole.
		(iii) Bromination of anisole in ethanoic acid medium.
		(iv) Friedel-Craft's acetylation of anisole.
		20. An organic compound with the molecular formula $C_9H_{10}O$ forms 2, 4-DNP derivative, reduces Tollens' reagent and undergoes Cannizzaro reaction. On vigorous oxidation, it gives 1, 2-benzenedicarboxylic acid. Identify the compound.
		21. An organic compound contains 69.77% carbon, 11.63% hydrogen and rest oxygen. The molecular mass of the compound is 86. It does not reduce Tollens' reagent but forms an addition compound with sodium hydrogensulphite and give positive iodoform test. On vigorous oxidation it gives ethanoic and propanoic acid. Write the possible structure of the compound.
		22. An organic compound (A) (molecular formula $C_8H_{16}O_2$) was hydrolysed with dilute sulphuric acid to give a carboxylic acid (B) and an alcohol (C). Oxidation of (C) with chromic acid produced (B). (C) On dehydration gives but-1-ene.Write equations for the reactions involved.
		23. Which of the following compounds would undergo aldol condensation, which the Cannizzaro reaction and which neither? Write the structures of the expected products of aldol condensation and Cannizzaro reaction.
		(i) Methanal (ii) 2-Methylpentanal (iii) Benzaldehyde
		(iv) Benzophenone (v) Cyclohexanone
		24. Predict the products formed when cyclohexanecarbaldehyde reacts with following reagents.
		a. PhMgBr and then H_3O^+
		b. Tollens' reagent
		c. Semicarbazide and weak acid
		d. Excess ethanol and acid
		e. Zinc amalgam and dilute hydrochloric acid
		25. Give a chemical test to distinguish the following pairs of compounds:
		a. Ethanal and propanal
		b. Acetophenone and benzophenone
		c. phenol and benzoic acid
		d. Propanal and propanaone
		e. Ethanol and propanol.
4.	Mathematics	• **Write the solutions of questions given in the worksheet in separate answer sheets and file them.** • Complete your Activity book journal.
5.	Biology	• Solve set no.1 and set.no. 2 question paper in note book. • Complete your practical journal. • Finish your investigatory project with case study and thoroughly.
6.	Informatics Practices	1) Write Model Test Paper-Appendix-D in Notebook 2) Solve Practice Paper-Appendix-E in Notebook **From IP-Text Book –Page numer-A.27(Appendix-D)A.37(Appendix-E)**

7.	Physical Education	Answer all the questions given in the pdf of question bank of following units in Notebook. Unit - 1: Management of Sporting Events, Unit - 2: Children and Women in Sports, Unit - 3: Yoga as Preventive Measure for Lifestyle Disease, Unit - 4: Physical Education and Sports for Children with Special Needs, Unit - 5: Sports and Nutrition
8.	Psychology	Prepare a file on Case based questions as per the worksheet. (PDF of the worksheet will be sent to you by the concern subject teacher.)

NOTE:

- ❖ Students need to complete the subject specific assignments as per the instructed norms.
- ❖ Detailed guidelines are explained in the classes.
- ❖ **Worksheets and Sample Question Papers will be shared on Class WhatsApp Broadcast group and School App. You are advised to take the printout of the same and use the hard copies for doing the homework.**
- ❖ **Submission date for all assignments is 18th November, 2024, Monday.**
- ❖ These assignments are a part of the Internal Assessments and will be marked for the same. It is mandatory for the students to complete the assignments and submit it to the concerned **teachers.**
- ❖ Students are requested to get their doubts regarding the assignments during regular classes.

May the divine light of Diwali spreads into your life and bring peace, prosperity, happiness, good health and grand success.

शुभ दीपावली 2024

MATHEMATICS (041)

Chapter 8 – APPLICATIONS OF INTEGRATION

Q1. Find the area of region: $\{(x,y): 0 \le y \le x^2, \ 0 \le y \le x+2; \ 0 \le x \le 3\}$

Q2. Find the area of the region included between the parabola $y^2 = x$ and the line $x+y = 2$.

Q3. Find the area of the region bounded by the lines $x+2y=2$, $y-x=1$ and $2x+y=7$.

Q4. Find the area of the region under the curve $y = |x+3|$ above x axis and between $x = -6$ and $x = 0$.

Q5. Find the area of the region bounded by the triangle whose vertices are $(-1, 0)$, $(1, 3)$ and $(3, 2)$.

Q6. Find area of the region by $\{(x, y): x^2 \le y \le |x|\}$.

Q7. Find the area of the ellipse $\frac{x^2}{225} + \frac{y^2}{361}$.

Chapter 9 – DIFFERENTIAL EQUATIONS

Q8. Solve the following d.e. $\frac{dy}{dx} = \sqrt{1-y^2}, -1 < y < 1$

Q9. Solve the following d.e. $\frac{dy}{dx} + y = 1, y \ne 1$

Q10. Find the integrating factor of the d.e.: $x\frac{dy}{dx} - y = 2x^2$.

Q11. Find integrating factor of the d.e.:$(1-y^2)\frac{dy}{dx} + yx = ay, -1 < y < 1$.

Q12. Find the equation of that curve whose slope at any point on it is equal to $y+2x$.

Q13. Solve the d.e.: $x \cos y \, dy = (xe^x \log x + e^x)dx$.

Q14. Solve the following d.e.: $x\frac{dy}{dx} - y + x \sin\left(\frac{y}{x}\right) = 0$.

Q15. Find the solution of the differential equation $\frac{dy}{dx} + y \cot x = 2x + x^2 \cot x, (x \ne 0)$ given that $y = 0$ when $x = \frac{\pi}{2}$.

Q16. For the given d.e., find a particular solution satisfying the given condition:
$(1 + x^2)\frac{dy}{dx} + 2xy = \frac{1}{1+x^2}$; Given $y(\pi/2) = 0$

Q17. Find the particular solution of d.e. $\frac{dy}{dx} + y \cot x = 4x \, \text{cosec} \, x$; given $y = 0$ when $x = \pi/2$.

Q18. At any point (x, y) of a curve, the slope of the tangent is twice the slope of a line segment joining the point of contact to the point $(-4,-3)$. Find the equation of the curve given that it passes through the point $(-2, 1)$.

Q19. Solve the d.e.: $(x^3 + x^2 + x + 1)\frac{dy}{dx} = 2x^2 + x$, given that y=1, when x=0.

Q20. Solve the d.e.$(1 + e^{x/y})dx + e^{x/y}\left(1 - \frac{x}{y}\right)dy = 0$.

Chapter 10 – VECTOR ALGEBRA

Q21. In a triangle ABC, sides AB and BC are represented by the vectors $2\hat{\imath} - \hat{\jmath} + 2\hat{k}, \hat{\imath} + 3\hat{\jmath} + 5\hat{k}$ respectively. Find vector representing CA.

Q22. Find the value of λ, for which the vector $\vec{a} = 3\hat{\imath} - \hat{\jmath} + 2\hat{k}$ and $\vec{b} = 3\hat{\imath} - \hat{\jmath} + 2\hat{k}$ are perpendicular to each other.

Q23. Write the value of: $\hat{\imath}.(\hat{\jmath} \times \hat{k}) + \hat{\jmath}.(\hat{k} \times \hat{\imath}) + \hat{k}.(\hat{\jmath} \times \hat{\imath})$

Q24. Find the magnitude of each of the two vectors $\vec{a} \ and \ \vec{b}$, having the same magnitude such that the angle between them is $60°$ and their scalar product is $9/2$.

Q25. Find the acute angle which the line with direction cosines $\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{6}}, n$ makes with positive direction of z-axis.

Q26. Write the position vectors of points dividing the line segment joining points A and B with position vectors **a** and **b** internally and externally in the ratio 1:4 where $\boldsymbol{a} = 2\hat{\imath} + 3\hat{\jmath} + 4\hat{k} \ and \ \boldsymbol{b} = -\hat{\imath} + \hat{\jmath} + \hat{k}$

Q27. Let $\vec{a} = 4\hat{\imath} + 5\hat{\jmath} - \hat{k}$, $\vec{b} = \hat{\imath} - 4\hat{\jmath} + 5\hat{k}$ and $\vec{c} = 3\hat{\imath} + \hat{\jmath} - \hat{k}$. Find a vector $\vec{d}$ which is perpendicular to both $\vec{b}$ and $\vec{c}$ and $\vec{d}.\vec{a} = 21$.

Q28. If θ is the angle between two vectors $\hat{\imath} - 2\hat{\jmath} + 3\hat{k}$ and $3\hat{\imath} - 2\hat{\jmath} + \hat{k}$, find $\sin\theta$.

Q29. If $\vec{a} = 2\hat{\imath} + \hat{\jmath} - \hat{k}$, $\vec{b} = 4\hat{\imath} - 7\hat{\jmath} + \hat{k}$, find a vector $\vec{c}$ such that $\vec{a} \times \vec{c} = \vec{b}$ and $\vec{a}.\vec{c} = 6$.

Q30. If $\vec{a} = (\hat{\imath} + 2\hat{\jmath} + \hat{k})$, $\vec{b} = (2\hat{\imath} + \hat{\jmath})$ and $\vec{c} = (3\hat{\imath} - 4\hat{\jmath} - 5\hat{k})$, then find a unit vector perpendicular to both the vectors $(\vec{a} - \vec{b})$ and $(\vec{c} - \vec{b})$.

Q31. If $\vec{a} = (2\hat{\imath} - 3\hat{\jmath} + \hat{k})$, $\vec{b} = (-\hat{\imath} + \hat{k})$ and $\vec{c} = (2\hat{\jmath} - \hat{k})$ are three vectors, find the area of the parallelogram having diagonals $(\vec{a} + \vec{b})$ and $(\vec{b} + \vec{c})$.

Q32. Let $\vec{a}, \vec{b}$ and $\vec{c}$ be three vectors of magnitude 3, 4, 5 respectively. If each one is perpendicular to the sum of the other two vectors, show that $|\vec{a} + \vec{b} + \vec{c}| = 5\sqrt{2}$.

Q33. If $\vec{\alpha} = (3\hat{\imath} - \hat{\jmath})$ and $\vec{\beta} = (2\hat{\imath} + \hat{\jmath} - 3\hat{k})$, express $\vec{\beta}$ in the form of $\vec{\beta} = \vec{\beta_1} + \vec{\beta_2}$, where $\vec{\beta_1}$ is parallel to $\vec{\alpha}$ and $\vec{\beta_2}$ is perpendicular to $\vec{\alpha}$.

Q34. If $\vec{a} + \vec{b} + \vec{c} = 0$ and $|\vec{a}| = 3, |\vec{b}| = 5$ and $|\vec{c}| = 7$. Show that the angle between $\vec{a}$ and $\vec{b}$ is 60^0.

Q35. Find a unit vector perpendicular to each of the vectors $\vec{a} + \vec{b}$ and $\vec{a} - \vec{b}$, where $\vec{a} = 3\hat{\imath} + 2\hat{\jmath} + 2\hat{k}$ and $\vec{b} = \hat{\imath} + 2\hat{\jmath} - 2\hat{k}$.

Q36. Show that the four points (0, -1, -1), (4, 5, 1), (3, 9, 4) and (-4, 4, 4) are coplanar.

PHYSICAL EDUCATION (048)
CHAPTER – 8: BIOMECHANICS AND SPORTS

1 mark questions:

Q1. According to which law, a body at rest will remain at rest unless acted on by an external force.

Q2. According to which law, a change in the acceleration of an object is directly proportional to the force producing it and inversely proportional to its mass?

Q3. According to which law, for every action, there is always an equal and opposite reaction?

Q4. How many types of friction are there?

Q5. How many types of dynamic friction are there?

Q6. What it is called, when one body tends to move over the surface of another, but the actual motion has not yet started?

Q7. What it is called, when one body is actually moving over the surface of another body?

Q8. Ice-skating is an example of which friction.

Q9. Which type of friction it is called, when any object roll on any surface?

Q10. When all the forces acting on the body are counter balanced by equal and opposite force is called?

Q11. How many types of equilibrium are there?

Q12. An imaginary point around which the body or object is balanced is called.

Q13. What it is called, when a projectile follows the path?

Q14. What it is called when an object thrown into the space either horizon or an acute angle under the action of gravity?

Q15. How many types of levers are there?

Q16. In which type of lever, a fulcrum remains in between force and resistance.

Q17. In which type of lever, a load remains in between force and fulcrum.

Q18. In which type of lever, a force remains in between fulcrum and resistance.

2 marks questions:

Q1. Define Newton's Laws.

Q2. Define friction.

Q3. Define static friction.

Q4. Define dynamic friction.

3 marks questions:

Q5.   Explain, how Newton's laws are applicable in the field of sports with suitable examples.

Q6.   Explain different types of Equilibrium shortly.

Q7.   Describe three principles of stability.

Q8.   Define Centre of Gravity and how it is helpful in sports?

5 marks questions:

Q9.   Explain that factors which are affecting projectile trajectory.

Q10. Mention any three advantages and three disadvantages of friction.

Q11. Explain types of lever.

Q12. How lever is useful in sports, explain with suitable examples.

CHAPTER – 9: PSYCHOLOGY AND SPORTS

1 mark questions:

Q1.   In which type of personality, the individual is very competitive.

Q2.   In which type of personality, the individual is easy going and patient.

Q3.   In which type of personality, the individual is lethargic, passive, hopeless and pessimistic.

Q4.   In which type of personality, the individual is usually suffer from high degree of distress.

Q5.   In how many sociability characters, C. G. Jung has classified personality.

Q6.   In which type of personality, characteristics like shyness, social withdrawal and tendency to talk less are seen.

Q7.   In which type of personality, characteristics like tendency to be friendly, outgoing, talkative and social in nature are seen.

Q8.   In which type of personality, characteristics of Introvert and Extrovert are seen together.

Q9.   In which traits of personality, person is being imaginative, insightful and having a variety of interest?

Q10. In which traits of personality, person is remain organized, systematics, laborious and complete in all respects.

Q11. In which traits of personality, person is being energetic, talkative and assertive.

Q12. In which traits of personality, person is remain friendly, cooperative, kind and gentle.

Q13. In which traits of personality, person is remain moody and tense.

Q14. What it is called, when a person gives a value and respect to oneself?

Q15. What it is called, when a person is involved in activity through using his/her senses?

Q16. What it is called, when a person talks to oneself through his/her inner voice?

Q17. Which is the first step to turning the impossible into possible?

Q18. What do you mean by intrinsic?

Q19. What do you mean by extrinsic?

Q20. How many types of motivation are there?

2 marks questions:

Q1.   Define 'Personality' and 'Aggression'.

Q2.   Define motivation.

3 marks questions:

Q3.   Explain any three dimensions of personality.

Q4.   Explain any three types of personality.

Q5.   Explain the different types of aggression in sports.

Q6.   Write a short note on self-esteem and mental imagery.

Q7.   Write a short note on self-talk and goal setting.

5 marks questions:

Q8. How can you classify personality, according to C. G. Jung?

Q9. Describe any five traits of personality in your words.

Q10. Describe the types of motivation.

Q11. Explain any five techniques of motivation.

Q12. Explain any five reasons of exercise.

Q13. Explain any five benefits of exercise.

Q14. Explain any five strategies for enhancing adherence to exercise.