SRK DAV PUBLIC SCHOOL, SURIYA

SUMMER VACATION HOMEWORK (2021-22)

Std. XII

Sub-English

1. Answers the Textual Questions of Prose Chapters 1,2,3 and Poetry 1,2&3.
2. From Supplementary Reader
Chapters 1, 2 and 3
3. Writing : Write an analytical paragraph on Covid-19 Second Wave in India.

Sub- PHYSICS

Solve numericals of chapter 1and 2

Sub- Chemistry

Solve all numericals of Solid State and Electrochemistry.

Sub- Biology

Learn & Complete copy note work of CH: 1 – 5

Sub- Computer Sc.

Write some programs and perform operations related to List, Tuple, String, Dictionary and Sets.

Sub- Maths

IV. Long Answer Type Questions-II (6 Marks)

14. If matrix $A=\begin{bmatrix}1&1&1\\1&1&1\\1&1&1\end{bmatrix}$ then using P.M.I. prove that $A^n=\begin{bmatrix}3^{n-1}&3^{n-1}&3^{n-1}\\3^{n-1}&3^{n-1}&3^{n-1}\\3^{n-1}&3^{n-1}&3^{n-1}\end{bmatrix}$ where $n \in N$.

15. If matrix $A=\begin{bmatrix}2&1&5\\1&4&2\\3&0&3\end{bmatrix}$ and matrix $B=\begin{bmatrix}1&2&5\\0&4&1\\5&3&-1\end{bmatrix}$, then verify $(AB)^{-1}=B^{-1}A^{-1}$.

16. If matrix $A=\begin{bmatrix}0&1\\-1&0\end{bmatrix}$ and $B=\begin{bmatrix}3&7\\5&2\end{bmatrix}$, then verify that $P = BAB'$ and $Q = B'AB$ are skew symmetric matrix. [HOTS]

Time: 90 Minutes

ASSIGNMENTS

M.M.: 50

I. Very Short Answer Type Questions

(1 Mark)

1. What is the range of the function $\frac{|2x-3|}{2x-3}$?
2. If the function $f: R \to R$, defined by $f(x) = 3x - 4$ is invertible, find $f^{-1}(x)$.
3. State the reason for the relation R in the set $A = \{1, 2, 3\}$ given by $R = \{(1, 2), (2, 1)\}$ not to be transitive.
4. Let $\otimes$ be the binary operation on the set of all non-zero real numbers, given by $a \otimes b = \frac{ab}{5}$, for $a, b \in R - \{0\}$. Find the identity element of $\otimes$ operation.

II. Short Answer Type Questions

(2 Marks)

5. Check whether the relation R defined in the set $A = \{1, 2, 3, 4, 5, 6\}$ as $R = \{(a, b) : b = a + 1, a, b \in A\}$ is reflexive, symmetric or transitive.
6. If $f: R \to R$ be the functions defined by $f(x) = 4x^3 + 7$, show that f is a bijection.
7. If $R = \{(x, y) : x + 2y = 8\}$ is a relation on N. Write domain and range of R.
8. A binary operation $\otimes : R \times R \to R$ defined as $a \otimes b = a + b - 5ab$. Find identity element of $\otimes$ operation.

III. Long Answer Type Questions-I

(4 Marks)

9. Let $\otimes$ be a binary operation on Q defined by $a \otimes b = \frac{3ab}{5}$. Show that $\otimes$ operation is commutative, associative, find its identity element, if it exists and also find a^{-1}.
10. Show that the relation S defined on the set $N \times N$ by $(a, b)\ S\ (c, d) \Rightarrow a + d = b + c$ is an equivalence relation.
11. Let $A = R - \{3\}$ and $B = R - \{-1\}$. Consider the function $f: A \to B$ defined by $f(x) = \left(\frac{x-2}{x-3}\right)$, $x \neq 3$. Show that f is one-one and onto and hence find $f^{-1}(x)$.
12. Show that the function f in $A = R - \left\{\frac{2}{3}\right\}$ defined by $f(x) = \frac{3x+2}{5x+3}$, $x \neq \frac{-3}{5}$ is one-one and onto. Hence find $f^{-1}(x)$.
13. Let $f: A \to B$ and $g: B \to C$ be one-one onto functions. Prove that $(gof): A \to C$ which is one-one onto and $(gof)^{-1} = f^{-1}og^{-1}$.

IV. Long Answer Type Questions-II

(6 Marks)

14. Let $f: N \to R$ be a function defined as $f(x) = 4x^2 + 12x + 15$. Show that $f: N \to S$ where S is range of f, is invertible. Find also the inverse of $f(x)$.
15. Show that the function $f: R \to \{x \in R : -1 < x < 1\}$ defined by $f(x) = \frac{x}{1+|x|}$, $x \in R$ is one-one and onto function.
16. Show that the relation R defined by $(a, b)\ R\ (c, d) \Rightarrow a + d = b + c$ on the $A \times A$ where $A = \{1, 2, 3, ..., 10\}$ is an equivalence relation.

ASSIGNMENTS

Time: 90 Minutes **M.M.: 50**

I. Very Short Answer Type Questions (1 Mark)

1. Find the principal value: $\sin^{-1}\left(\sin\frac{3\pi}{4}\right)$
2. Evaluate: $\cos\left(\tan^{-1}\frac{12}{5}\right)$
3. Prove that: $2\tan^{-1}\left(\frac{2}{3}\right)=\cos^{-1}\left(\frac{5}{13}\right)$
4. Simplify: $\tan^{-1}\sqrt{\frac{1-\sin x}{1+\sin x}}$

II. Short Answer Type Questions (2 Marks)

5. Evaluate: $\left[3\sin^{-1}\left(-\frac{1}{2}\right)+2\sin^{-1}\left(\frac{-\sqrt{3}}{2}\right)-\tan^{-1}\left(\frac{-1}{\sqrt{3}}\right)\right]$
6. If $x=\tan^{-1}\left(\tan\frac{5\pi}{4}\right)$ and $y=\tan^{-1}\left(\tan\frac{\pi}{3}\right)$, then show that: $4x=3y$.
7. Evaluate: $\cos\left[3\sin^{-1}\left\{\frac{1}{2}\tan\left(2\cos^{-1}\frac{\sqrt{3}}{2}\right)\right\}\right]$
8. Show that: $\cot^{-1}\left(\frac{1+ab}{a-b}\right)+\cot^{-1}\left(\frac{1+bc}{b-c}\right)+\cot^{-1}\left(\frac{1+ca}{c-a}\right)=0$

III. Long Answer Type Questions-I (4 Marks)

9. If $y=\cot^{-1}\sqrt{\cos x}-\tan^{-1}\sqrt{\cos x}$; then prove that $\sin y=\tan^2\frac{x}{2}$
10. Prove that $\tan^{-1}\left[\frac{\sqrt{1+x^2}+\sqrt{1-x^2}}{\sqrt{1+x^2}-\sqrt{1-x^2}}\right]=\frac{\pi}{4}+\frac{1}{2}\cos^{-1}x^2$.
11. Prove that $\tan\left[\frac{1}{3}\left\{\tan^{-1}\left(\frac{3x-x^3}{1-3x^2}\right)+\tan^{-1}\left(\frac{3y-y^3}{1-3y^2}\right)\right\}\right]=\frac{x+y}{1-xy}$.
12. If $\tan^{-1}\left[\frac{\sqrt{1+x^2}-\sqrt{1-x^2}}{\sqrt{1+x^2}+\sqrt{1-x^2}}\right]=\alpha$, then prove that $x^2=\sin 2\alpha$.
13. Prove that $2\tan^{-1}\left(\frac{1}{2}\right)+\tan^{-1}\left(\frac{1}{7}\right)=\tan^{-1}\left(\frac{31}{17}\right)$

IV. Long Answer Type Questions-II (6 Marks)

14. If $\cos^{-1}\left(\frac{x}{a}\right)+\cos^{-1}\left(\frac{y}{b}\right)=\alpha$, then prove that: $\frac{x^2}{a^2}+\frac{y^2}{b^2}-\frac{2xy}{ab}\cos\alpha=\sin^2\alpha$.
15. Solve for x: $\tan^{-1}\left(\frac{x-1}{x-2}\right)+\tan^{-1}\left(\frac{x+1}{x+2}\right)=\frac{\pi}{4}$
16. Prove that: $\tan\left[\frac{\pi}{4}+\frac{1}{2}\cos^{-1}\left(\frac{a}{b}\right)\right]+\tan\left[\frac{\pi}{4}-\frac{1}{2}\cos^{-1}\left(\frac{a}{b}\right)\right]=\frac{2b}{a}$

ASSIGNMENTS

Time: 90 Minutes **M.M.: 50**

I. Very Short Answer Type Questions (1 Mark)

1. A matrix has 8 elements, write its all possible orders.
2. Show that $\cos\theta\begin{bmatrix}\cos\theta & \sin\theta\\ -\sin\theta & \cos\theta\end{bmatrix}+\sin\theta\begin{bmatrix}\sin\theta & -\cos\theta\\ \cos\theta & \sin\theta\end{bmatrix}=I$.
3. If matrix $A=\begin{bmatrix}2 & 3\\ 1 & 2\end{bmatrix}$ and matrix $B=\begin{bmatrix}2 & -3\\ -1 & 2\end{bmatrix}$, then show that $A^{-1}=B$ and $B^{-1}=A$.
4. If $A=\begin{bmatrix}7 & 3\\ 4 & 8\end{bmatrix}$, find $P=AA'$ and show that P is symmetric matrix.

II. Short Answer Type Questions (2 Marks)

5. Construct a matrix of order 3×3 whose general element is $a_{ij}=3i+4j$.
6. Find the number of all possible matrices of order 3×2 with each entry 0, 1 and 2.
7. If $A=\begin{bmatrix}\alpha & \beta\\ \gamma & -\alpha\end{bmatrix}$ is such that $A^2=I$ then show that $\alpha^2+\beta\gamma=1$.
8. If $f(\theta)=\begin{bmatrix}\cos\theta & i\sin\theta\\ i\sin\theta & \cos\theta\end{bmatrix}$, then prove that $f(\theta).f(\theta)=f(2\theta)$.

III. Long Answer Type Questions-I (4 Marks)

9. Construct a matrix $A=[a_{ij}]_{3\times 3}$ when $a_{ij}=\begin{cases}5i+3j & \text{if } i<j\\ 7 & \text{if } i=j\\ 4i-3j & \text{if } i>j\end{cases}$.
10. To raise money for an orphanage, students of three schools A, B and C organised an exhibition in their locality where they sold paper bags, scrap books and pastel sheets made by them using recycled paper at the rate of ₹ 20, ₹ 15 and ₹ 10 per unit respectively. School A sold 25 paper bags, 10 scrap books and 30 pastel sheets. School B sold 20 paper bags, 15 scrap books and 30 pastel sheets, while School C sold 25 paper bags, 18 scrap books and 35 pastel sheets. Using matrices, find the total amount raised by each school. By such exhibition which values are inculcated in the students?
11. If $f(\theta)=\begin{bmatrix}\sin^2\theta & \sin\theta\cos\theta\\ \sin\theta\cos\theta & \cos^2\theta\end{bmatrix}$ then show that $f(\theta)f(\phi)=0$ when $(\theta-\phi)$ is an odd multiple of $\frac{\pi}{2}$.
12. If $f(\theta)=\begin{bmatrix}\cos\theta & i\sin\theta\\ i\sin\theta & \cos\theta\end{bmatrix}$, then show that: $[f(\theta)]^3=\begin{bmatrix}\cos 3\theta & i\sin 3\theta\\ i\sin 3\theta & \cos 3\theta\end{bmatrix}$
13. Show that: $\begin{bmatrix}1 & \tan\theta\\ -\tan\theta & 1\end{bmatrix}\begin{bmatrix}1 & -\tan\theta\\ \tan\theta & 1\end{bmatrix}=(\sec^2\theta)I$ **[V. Imp.]**

SUB-PHE

EXERCISES

A. MULTIPLE CHOICE QUESTIONS : 1 mark each

Choose the correct option :

1. *Which is the example of an Intramural game ?*
   (a) Matches between two houses of a school (b) Matches between two countries
   (c) Matches between two clubs (d) Matches between two communities

2. *Which is the example of an Extramural game ?*
   (a) Matches between two university teams (b) Matches between father and son
   (c) Matches between two sections of a class (d) Sports day in school

3. *How many byes will be given if 18 teams will participate in a knock out tournament ?*
   (a) 6 (b) 4
   (c) 14 (d) 16

4. *How many byes will be given if 29 teams will participate in a knock out tournament ?*
   (a) 2 (b) 12
   (c) 13 (d) 3

5. *If 6 teams participate in single round robin league tournament, how many matches each team will play ?*
   (a) 4 (b) 5
   (c) 6 (d) 7

6. *If 4 teams participate in double round robin league tournament, how many matches each team will play ?*
   (a) 12 (b) 4
   (c) 6 (d) 8

7. *Which is not included in tournament types ?*
   (a) composition (b) round robin
   (c) knock out (d) combination

8. *Which is not the goal of an Intramural game ?*
   (a) Sportsmanship (b) Sociability
   (c) Developing Rivalry (d) Healthy competition

9. *Which tournament will have more matches with beginner level players ?*
   (a) Intramural (b) Extramural
   (c) District championship (d) National Tournament

10. *What is Run for Unity ?*
    (a) Run for uniting two friends
    (b) Run for uniting two companies
    (c) Run for uniting different segments of society
    (d) Run for uniting body mind and spirit

B. VERY SHORT ANSWER TYPE QUESTIONS : 1 mark each

1. What is planning ?
2. What is league tournament ?
3. What is single league tournament ?
4. What is double league tournament ?
5. What is Cyclic method of fixture ?
6. What is Staircase method of fixture ?
7. What is Bye ?
8. What is intramural ?
9. What is Health run ?
10. What is Run for fun ?
11. What is Run for Unity ?
12. What is Run for Awareness ?
13. What is Medical Committee ?
14. What is Press and Media Committee ?
15. What are the types of combination tournament ?

C. SHORT ANSWER TYPE QUESTIONS : 3 marks each

[Answers should not exceed 80-90 words each.]

1. What are the objectives of planning ?
2. Write a short note on two National level tournaments.
3. Explain Single league tournament with one fixture.
4. What are the advantages of knock out system of tournament ? What will be the total no. of Byes if the no. of Participating team is 13 ?
5. Explain in brief various types of League matches.

D. LONG ANSWER TYPE QUESTIONS : 5 marks each

[Answers should not exceed 150-200 words each.]

1. Enlist the committees for organizing sports event and explain any eight committees in detail.
2. Explain the meaning of specific sport programs. Explain any four.
3. What do you means by intramurals ? Mention the significance of intramurals for school children.
4. What are the objective of intramural tournaments ?

EXERCISES

A. MULTIPLE CHOICE QUESTIONS : 1 mark each

Choose the correct option :

1. *What is balanced diet ?*
   (a) Tasty food
   (b) Food without sugar
   (c) Food that contain every essential nutrient
   (d) Food that helps in achieving body balance

2. *What is dieting ?*
   (a) Eating extra food
   (b) Eating minimal or specific kinds of food
   (c) Eating raw meat
   (d) Fasting

3. *How many macro nutrients are there ?*
   (a) 3
   (b) 2
   (c) 4
   (d) 5

4. *Which type of vitamin is synthesised from sunlight ?*
   (a) B6
   (b) D
   (c) A
   (d) C

5. *What is the building block of our body ?*
   (a) Protein
   (b) Carbohydrates
   (c) Vitamins
   (d) Glycerine

6. *Which food component gives the most energy ?*
   (a) Fats
   (b) Proteins
   (c) Vitamins
   (d) Minerals

7. *Folic Acid is necessary for ?*
   (a) Old people
   (b) Athletes
   (c) Pregnant ladies
   (d) New born babies

8. *Deficiency of vitamin A results in* _____ .
   (a) Weak bones
   (b) Tiredness
   (c) Obesity
   (d) Night Blindness

9. *Which type of Fats are good for health ?*
   (a) Saturated
   (b) Trans
   (c) Unsaturated
   (d) All fats are bad

10. *What are Water soluble vitamins ?*
    (a) B&C
    (b) C&D
    (c) A&B
    (d) B&D

EXERCISES

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10. *What are Water soluble vitamins ?*
    (a) B&C
    (b) C&D
    (c) A&B
    (d) B&D

D. LONG ANSWER TYPE QUESTIONS : 5 marks each

[Answers should not exceed 150-200 words e

1. What factors should be considered for making balanced diet ?
2. Why macronutrients are considered as essential part of our diet ?
3. Mention the types and effects of different micro nutrients on our body.
4. What are the effects of Diet on performance of sports persons ?
5. State four Myths of Dieting in detail.
6. What is a healthy weight ? Explain the methods for achieving a healthy weight.
7. Explain the causes, prevention and treatment for food intolerances.
8. Explain the macronutrients of our diet. How they are helpful in achieving high sports performance.
9. Explain the role of balanced diet in leading a happy and healthy life.

EXERCISES

A. MULTIPLE CHOICE QUESTIONS : 1 mark each

Choose the correct option :

1. *Which asana is used for curing back pain ?*
   (a) Bhujangasana (b) Vajrasana
   (c) Pavanamuktasana (d) Ardha Chakrasana
2. *Which Asana is used for curing Obesity ?*
   (a) Sukhasana (b) Chakrasana
   (c) Gomukhasana (d) Vajrasana
3. *Which Asana is used for curing Hypertension ?*
   (a) Pavanamuktasana (b) Hastasana
   (c) Vajrasana (d) Trikonasana
4. *Which Asana is used for curing Diabetes ?*
   (a) Paschimottanasana (b) Sukhasana
   (c) Pavanamuktasana (d) Vajrasana
5. *Which Asana is used for curing Asthma ?*
   (a) Tadasana (b) Gomukhasana
   (c) Bhujangasana (d) Trikonasana
6. *Which Asana is done while standing ?*
   (a) Tadasana (b) Vajrasana
   (c) Sukhasana (d) Ardha Chakrasana

7. *Which Asana is done while sitting ?*
   (a) Chakrasana
   (b) Matsyasana
   (c) Paschimottanasana
   (d) Sukhasana

8. *Which Asana is referred as mountain pose ?*
   (a) Bhujangasana
   (b) Gomukhasana
   (c) Parvatasana
   (d) Vakrasana

9. *Which Asana is refereed as snake pose ?*
   (a) Bhujangasana
   (b) Ardha Chakrasana
   (c) Shalabhasana
   (d) Sukhasana

10. *Which Asana is the easiest to perform ?*
    (a) Trikonasana
    (b) Sukhasana
    (c) Ardha Matsyendrasana
    (d) Paschimottanasana

...indications of Urdhva Hastasana.

D. LONG ANSWER TYPE QUESTIONS : 5 marks each

[Answers should not exceed 150-200 words each.]

1. Discuss asanas as preventive measures in detail.
2. What do you mean by obesity ? Discuss the benefits and contraindications of Pada Hastasana and Vajrasana.
3. Discuss the procedure, benefits and contraindications of Trikonsana and Ardha Matsyendrasana.
4. What do you mean by diabetes ? Discuss the procedure, benefits and contra indications of Bhujangasana.
5. What do you mean by Asthma ? Explain the procedure, benefits and contraindications of Chakrasana.
6. Elaborate the procedure and benefits of Tadasana and Pawanmuktasana.
7. What is hypertension ? Discuss the benefits and contraindications of Vajrasana and Ardha Chakrasana.
8. What do you mean by Back Pain ? Discuss the procedure and benefits of Shalabhasana.
9. Explain about any two asanas which are beneficial in preventing as well as curing asthma.