केन्द्रीय विद्यालय के एरिया , जीरकपुर

शरदावकाश गृहकार्य 2023-24

SUBJECT- ENGLISH CORE

Q1.Read "On the Face of It" by Susan Hill, "Memories of Childhood" by Zitkala-Sa and Bama. Write the Summary and do all the textual and extra questions.

Q2.Read "Poets and Pancakes" by Asokamitran, "Going Places" by A. R. Barton. Write the Summary and do all the textual and extra questions.

Q3.Paste and solve the September Monthly Test Question Paper in your notebook.

Q4.Do the entire Holidays' Homework in your fair notebook and learn the syllabus covered

विषय- हिन्दी

लिखित भाग

प्रश्न 1- निम्नलिखित विषयों पर रचनात्मक लेख लिखें

(1) मेरी अविस्करणीय यात्रा

(2) कक्षा 12वीं के बाद मेरी अपने भविष्य की योजनाएं

प्रश्न 2– सीबीएसई द्वारा प्रदत्त प्रतिदर्श प्रश्नपत्र को हल कीजिए ।

प्रश्न 3– वितान के पढ़ाए गए पाठ 'अतीत में दबे पांव' से तीस बहुविकल्पीय प्रश्न तैयार करें।

प्रश्न 4. कोई भी हिंदी साहित्य की एक पुस्तक पढ़े और उसकी पुस्तक समीक्षा लिखकर लाएं

अभ्यास भाग

प्रश्न 1– जनसंचार से सम्बंधित रेडियो नाटक और कैसे करें कहानी का नाट्य रूपांतरण का अभ्यास कीजिए ।

प्रश्न 2– वितान पुस्तक के समस्त पाठों का अभ्यास कीजिए ।

प्रश्न 3– आरोह के समस्त पाठों का अभ्यास कीजिए ।

SUBJECT-HISTORY

1. **Prepare project on allotted topic with interdisciplinary approach.**
2. **Solve sample question papers of history in your notebook.**
3. **Point out all map points of all three parts of history on political maps of India.**
4. **Read newspaper of any language daily specially during autumn break.**
5. **Revision of complete syllabus.**
6. **Solve monthly test in your notebook.**
7. **Write & Learn preamble of our constitution and our fundamental duties**

SUBJECT - GEOGRAPHY

1. **TWO SAMPLE PAPERS**
2. **MINERALS AND ENERGY RESOURCES NOTES AND NCERT QUESTION ANSWERS**
3. **TWO CHAPTERS OF PRACTICAL FILES**
4. **MAP WORK GIVEN BY CBSE**
5. **COME PREPARED FOR TEST (SYLLABUS : BOOK I LESSON 1,2 BOOK II LESSON 1,2)**
6. **ART INTEGRATED PROJECT AS GIVEN IN CLASS XITH ACCORDING TO YOUR ROLL NO.**

SUBJECT- ECONOMICS

1. **Prepare PROJECT on Economics for final practical examination.**
2. **Practice numerical on national income estimation**

3. Revise all the topics of Indian economic development
4. Practice any sample paper given by the cbse.

SUBJECT - INFORMATICS PRACTICES

1. Television cable network is an example of:
i. LAN
ii. WAN
iii. MAN
iv. Internet 1
2. Which of the following is not a type of cyber crime?
i. Data theft
ii. Installing antivirus for protection
iii. Forgery
iv. Cyber bullying 1
3. What is an example of e-waste?
i. A ripened mango
ii. Unused old shoes
iii. Unused old computers
iv. Empty cola cans 1
4. Which type of values will not be considered by SQL while executing thefollowing statement?
SELECT COUNT(column name) FROM inventory;
i. Numeric value
ii. text value
iii. Null value
iv. Date value 1
5. If column “Fees” contains the data set (5000,8000,7500,5000,8000), what willbe the output after the execution of the given query?
SELECT SUM (DISTINCT Fees)
FROM student;i. 20500
ii. 10000
iii. 20000

iv. 33500 1

6. 'O' in FOSS stands for:

i. Outsource

ii. Open

iii. Original

iv. Outstanding 1

7. Which SQL statement do we use to find out the total number of records presentin the table ORDERS?

i. SELECT * FROM ORDERS;

ii. SELECT COUNT (*) FROM ORDERS;

iii. SELECT FIND (*) FROM ORDERS;

iv. SELECT SUM () FROM ORDERS; 1

8. Which one of the following is not an aggregate function?

i. ROUND()

ii. SUM()

iii. COUNT()

iv. AVG() 1

9. Which one of the following functions is used to find the largest value from thegiven data in MySQL?

i. MAX( )

ii. MAXIMUM( )

iii. BIG( )

iv. LARGE( ) 1

10. To display last five rows of a series object 'S', you may write:

i. S.Head()

ii. S.Tail(5)

iii. S.Head(5)

iv. S.tail() 1

11. Which of the following statement will import pandas library?

i. Import pandas as pd

ii. import Pandas as py

iii. import pandas as pd

iv. import panda as pd 1

12. Which of the following can be used to specify the data while creating aDataFrame?

i. Series

ii. List of Dictionaries

iii. Structured ndarray

iv. All of these 1

13. Which amongst the following is not an example of a browser?

i. Chrome

ii. Firefox

iii. Avast

iv. Edge 1

14. In SQL, which function is used to display current date and time?

i. Date ()

ii. Time ()

iii. Current ()

iv. Now () 1

15. Legal term to describe the rights of a creator of original creative or artistic workis:

i. Copyright

ii. Copyleft

iii. GPL

iv. FOSS 1

16. _____is the trail of data we leave behind when we visit any website (or useany online application or portal) to fill-in data or perform any transaction.

i. Offline phishing

ii. Offline footprint

iii. Digital footprint

iv. Digital phishing 1

Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as

i. Both A and R are true and R is the correct explanation for A

ii. Both A and R are true and R is not the correct explanation for A

iii. A is True but R is False

iv. A is false but R is True

17. Assertion (A): - Internet cookies are text files that contain small pieces of data,like a username, password and user's preferences while surfing the internet.
Reasoning (R):- To make browsing the Internet faster & easier, its required to store certain information on the server's computer. 1

18. Assertion (A):- DataFrame has both a row and column index.
Reasoning (R): - A DataFrame is a two-dimensional

labelled data structure like a table of MySQL. 1

PART B

19. Explain the terms Web page and Home Page. OR
Mention any four networking goals. 2

20. Rashmi, a database administrator needs to display house wise total number of records of 'Red' and 'Yellow' house. She is encountering an error while executing the following query:

```
SELECT HOUSE, COUNT (*) FROM STUDENT
GROUP BY HOUSE WHERE HOUSE='RED' OR
HOUSE= 'YELLOW';
```

Help her in identifying the reason of the error and write the correct query by suggesting the possible correction (s). 2

21. What is the purpose of Order By clause in SQL? Explain with the help of suitable example. 2

22. Write a program to create a series object using a dictionary that stores the number of students in each house of class 12D of your school.
Note: Assume four house names are Beas, Chenab, Ravi and Satluj having 18, 2, 20, 18 students respectively and pandas library has been imported as pd. 2

23. List any four benefits of e-waste management. OR
Mention any four net etiquettes. 2

24. What will be the output of the following code:

```
>>>import pandas as pd
>>>A=pd.Series(data=[35,45,55,40])
>>>print(A>45)
```

2

25. Carefully observe the following code:

```
import pandas as pd
Year1={'Q1':5000,'Q2':8000,'Q3':12000,'Q4':
18000}
Year2={'A' :13000,'B':14000,'C':12000}
totSales={1:Year
1,2:Year2}
```

df=pd.DataFram
e(totSales)
print(df)
Answer the following:

i. List the index of the DataFrame df
ii. List the column names of DataFrame df. 2

SUBJECT- MATHEMATICS

(DAY -1 :- 20/10/2023)

RELATIONS & FUNCTIONS

1. Let A and B be two finite sets with n (A) = m and n (B) = n with m = n then find the number of bijective functions from A to B.

2. Let A = {1,2,3}. Find the number of equivalence relations containing (1,2) .

3. If A = {1,2,3}, B = {4,6,9} and R is a relation from A to B defined by ' x is smaller than y'.Write the range of R.

4. State whether The relation R = { (1,1),(2,2),(3,3)} on {1,2,3} is equivalence relation or not.

5. Let A = R - {3} and B = R - {1}. Consider the function f : A $\rightarrow$B defined by

   f (x) = $\left(\frac{x-2}{x-3}\right)$ Is f one-one and onto? Justify your answer

6. Consider a function f : $R_+ \rightarrow [-5, \infty)$ defined $f(x) = 9x^2 + 6x - 5$. Show that f is

one- one and onto function, Where R_+ is the set of all non-negative real numbers.

7. Show that the function f: R → {x∈R :-1 < x < 1} defined by f(x) = $\frac{x}{1+|x|}$, x ∈R is one- one and onto function.

8. Show that the relation R in the set A = {1, 2, 3, 4, 5} given by R = {(a, b) : |a - b| is even}, is an equivalence relation. Show that all the elements of {1, 3, 5} are related to each other and all the elements of {2, 4} are related to each other. But no element of {1, 3, 5} is related to any element of {2, 4}.

9. Show that each of the relation R in the set A = {x ∈Z : 0 ≤ x ≤ 12}, given by

   R = {(a, b) : |a - b| is a multiple of 4} is an equivalence relation. Find the set of all

   elements related to 1.

10. Let N denote the set of all natural numbers and R be the relation on N×Ndefined by $(a,b)R(c,d)\Leftrightarrow ad(b+c)=bc(a+d)$ prove that R is an equivalence relation on N×N.

ANSWERS

1)[n!]2) {4,6,9}

3) Equivalence

Relation 9) {1, 5, 9}

(DAY -2 :- 21/10/2023)

INVERSE TRIGONOMETRIC FUNCTIONS

* Domain & Range of the Inverse Trigonometric Function :

	Functions	*Domain*	*Range*(Principal value Branch)
I.	$\sin^{-1}$:	$[-1,1]$	$[-\pi/2,\pi/2]$
II.	$\cos^{-1}$:	$[-1,1]$	$[0,\pi]$
III.	cosec^{-1}:	$R-(-1,1)$	$[-\pi/2,\pi/2]-\{0\}$
IV.	$\sec^{-1}$:	$R-(-1,1)$	$[0,\pi]-\{\pi/2\}$
V.	$\tan^{-1}$:	R	$(-\pi/2,\pi/2)$
VI.	$\cot^{-1}$:	R	$(0,\pi)$

1). Find the principal value of $\sec^{-1}(-2)$.

2) Find the principal value of $\sin^{-1}\left(\cos\frac{2\pi}{3}\right)$.

3) Find the principal value of $\cot^{-1}\left(\tan\frac{3\pi}{4}\right)$.

4). Find the value of $\sin^{-1}\left\{\cos(\sin^{-1}\frac{\sqrt{3}}{2})\right\}$.

5). Find the value of $\cot\left[\sin^{-1}\left\{\cos\left(\tan^{-1}1\right)\right\}\right]$.

6) . Principal value of $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$ **is equal to**

7) Evaluate :- $\cos^{-1}\left(\cos\frac{2\pi}{3}\right)+\sin^{-1}\left(\sin\frac{2\pi}{3}\right)$

8) Evaluate :- $\cos^{-1}\left(\cos\frac{7\pi}{6}\right)$

9) Write the principal value of $\tan^{-1}\left(\sqrt{3}\right)-\cot^{-1}\left(-\sqrt{3}\right)$.

10) Write the value of $\tan^{-1}\left[2\sin\left(2\cos^{-1}\frac{\sqrt{3}}{2}\right)\right]$

ANSWERS

1). $\frac{2\pi}{3}$	**2).** $-\frac{\pi}{6}$	**3)** $-\frac{\pi}{4}$	**4)** $\frac{3\pi}{4}$	**5)** $\frac{\pi}{6}$
6) $\frac{5\pi}{6}$	**7)** $\frac{5\pi}{3}$	**8)** $\frac{5\pi}{6}$	**9)** $\frac{\pi}{2}$	**10** $-\frac{\pi}{3}$

(DAY -3 :- 22/10/2023)

MATRICES

1) If $[2x \quad 3]\begin{bmatrix} 1 & 2 \\ -3 & 0 \end{bmatrix}\begin{bmatrix} x \\ 8 \end{bmatrix} = O$, find x.

2) Find the matrix P satisfying the matrix equation $\begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix} P \begin{bmatrix} -3 & 2 \\ 5 & -3 \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$. Also find a matrix Q such that P + Q = O, where O is a zero matrix

3) If $A = \begin{bmatrix} 0 & -\tan\frac{\alpha}{2} \\ \tan\frac{\alpha}{2} & 0 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$. Prove that $I + A = (I - A)\begin{bmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{bmatrix}$

4) If $A = \begin{bmatrix} 3 & 1 \\ 7 & 5 \end{bmatrix}$, find x and y such that $A^2 + xI = yA$. Also find the value of (x - y).

5) For what value of x: $[1 \quad 2 \quad 1]\begin{bmatrix} 1 & 2 & 0 \\ 2 & 0 & 1 \\ 1 & 0 & 2 \end{bmatrix}\begin{bmatrix} 0 \\ 2 \\ x \end{bmatrix} = O$. Use the value of x to find A^2, if $A = \begin{bmatrix} x & -x \\ -x & x \end{bmatrix}$.

6) If $A = \begin{bmatrix} 3 & -5 \\ -4 & 2 \end{bmatrix}$, show that $A^2 - 5A - 14I = O$.

7) Let $A = \begin{bmatrix} 2 & -1 \\ 3 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 5 & 2 \\ 7 & 4 \end{bmatrix}$, $C = \begin{bmatrix} 2 & 5 \\ 7 & 4 \end{bmatrix}$. Find a matrix D such that CD - AB = O.

8) Express A = $\begin{bmatrix} 3 & 2 & 3 \\ 4 & 5 & 3 \\ 2 & 4 & 5 \end{bmatrix}$ as the sum of a symmetric(P) and a skew-symmetric (Q)

matrix. Also find $P^T + Q^T$.

9) If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$, then prove that $A^2 - 4A - 5I = 0$ and, hence find A^{-1}.

10) Let A = $\begin{bmatrix} 2 & 3 \\ -1 & 2 \end{bmatrix}$ and $f(x) = x^2 - 4x + 7$. Show that f(A) = O. Use this result to

find A^5.

ANSWERS

1) $x = 0, x = \frac{-23}{2}$ 2) P= $\begin{bmatrix} 25 & 15 \\ -37 & -22 \end{bmatrix}$, Q = $\begin{bmatrix} -25 & -15 \\ 37 & 22 \end{bmatrix}$ 4) . x = 8, y = 8; 0

5) x = -1, A^2 = $\begin{bmatrix} 2 & -2 \\ -2 & 2 \end{bmatrix}$ 7. D = $\begin{bmatrix} -191 & -110 \\ 77 & 44 \end{bmatrix}$

8) $\begin{bmatrix} 3 & 3 & 5/2 \\ 3 & 5 & 7/2 \\ 5/2 & 7/2 & 5 \end{bmatrix} + \begin{bmatrix} 0 & -1 & 1/2 \\ 1 & 0 & 1/2 \\ -1/2 & 1/2 & 0 \end{bmatrix}$; $\begin{bmatrix} 3 & 4 & 2 \\ 2 & 5 & 4 \\ 3 & 3 & 5 \end{bmatrix}$

9) $A^{-1} = \begin{bmatrix} -3 & 2 & 2 \\ 2 & -3 & 2 \\ 2 & 2 & -3 \end{bmatrix}$ 10. $\begin{bmatrix} -118 & -93 \\ 31 & -118 \end{bmatrix}$

(DAY -4 :- 23/10/2023)

Determinants

1. Using matrix method, solve: x + y + z = 6; y + 3z = 11; x - 2y + z = 0
2. Using matrix method, solve: 3x - 2y +3z = 8; 2x + y - z = 1; 4x -3 y +2z = 4
3. Solve the system using matrices: $\frac{2}{x} + \frac{3}{y} + \frac{10}{z} = 4$; $\frac{4}{x} - \frac{6}{y} + \frac{5}{z} = 1$; $\frac{6}{x} + \frac{9}{y} - \frac{20}{z} = 2$
4. If A = $\begin{bmatrix} 2 & 3 & 1 \\ -3 & 2 & 1 \\ 5 & -4 & -2 \end{bmatrix}$, find A^{-1} and use it to solve the system of equations:

2x - 3y + 5z = 11, 3x + 2y - 4z = - 5, x + y - 2z = - 3

5. Using matrices, solve the following system of equations:

(i) x + 2y - 3z = - 4

2x + 3y + 2z = 2

3x - 3y - 4z = 11

(ii) 4x + 3y + 2z = 60

x + 2y + 3z = 45

6x + 2y + 3z = 70

6. Find the product AB, where A == $\begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix}\begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{bmatrix}$ and use it to

solve the equations: x - y + z = 4, x - 2y - 2z = 9, 2x + y + 3z = 1

7. Using matrices, solve the following system of equations:

$\frac{1}{x}-\frac{1}{y}+\frac{1}{z}=4$; $\frac{2}{x}+\frac{1}{y}-\frac{3}{z}=0$, $\frac{1}{x}+\frac{1}{y}+\frac{1}{z}=2$

8. Find the product AB, where A = $\begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix}$ and B= $\begin{bmatrix} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 6 & 1 & -2 \end{bmatrix}$ and

use it to solve: x - y +2 z = 1, 2y - 3z = 1, 3x - 2y + 4z = 2.

9. Find A^{-1} if A = $\begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$ and show that $A^{-1} = \frac{A^2-3I}{2}$.

10. Given A = $\begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix}$, B = $\begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix}$, find BA and use this to solve the system of equations: $y + 2z = 7, x - y = 3, 2x + 3y + 4z = 17.$

ANSWERS

1. x = 1, y = 2, z = 3 2. x = 1, y = 2, z = 3 3. x = 2, y = 3, z = 5

4. x = 1, y = 2, z = 3 **5. (i) x = 3, y = -2, z = 1** **(ii) x = 5, y = 8, z = 8**

6. AB = 8I, x = 3, y = - 2, z = -1 **7. x = $\frac{1}{2}$, y = -1, z = 1**

8. x = 0, y = 5, z = 3 **9. $A^{-1} = \begin{bmatrix} -1 & 1 & 1 \\ 1 & -1 & 1 \\ 1 & 1 & -1 \end{bmatrix}$** **10. x =2, y = -1, z = 4**

(DAY -5 :- 24/10/2023)

CONTINUITY AND DIFFERENTIABILITY

1. Find the value of k for which f(x) = $\begin{cases} \frac{\sqrt{1+kx}-\sqrt{1-kx}}{x}, & -1 \le x < 0 \\ \frac{2x+1}{x-1}, & 0 \le x \le 1 \end{cases}$ **is continuous at x = 0 .**

2. If f(x) = $\begin{cases} 3ax+b, & \text{if } x>1 \\ 11 & \text{if } x=1 \\ 5ax-2b, & \text{if } x<1 \end{cases}$ **, continuous at x = 1,find the values of a and b.**

3. If f(x) = $\begin{cases} \frac{1-\sin^3 x}{3\cos^2 x}, & \text{if } x < \frac{\pi}{2} \\ a & \text{if } x = \frac{\pi}{2} \\ \frac{b(1-\sin x)}{(\pi-2x)^2} & \text{if } x > \frac{\pi}{2} \end{cases}$ **is continuous at x =** $\frac{\pi}{2}$**, find a, b.**

4. If $y = (\log_e x)^x + x^{\log_e x}$ find $\frac{dy}{dx}$.

5. If $x = a(\theta - \sin\theta)$, $y = a(1+\cos\theta)$, find $\frac{d^2y}{dx^2}$ at $\theta = \frac{\pi}{2}$

6 If x = $a\left(\cos\theta + \log\tan\frac{\theta}{2}\right)$ and $y = a\sin\theta$ **find** $\frac{dy}{dx}$ **at** $\theta = \frac{\pi}{4}$.

7. If $y = \sin\left(m\sin^{-1}x\right)$, prove that $(1-x^2)\frac{d^2y}{dx^2} - x\frac{dy}{dx} + m^2y = 0$

8. If $x^m.y^n = (x+y)^{m+n}$, prove that $\frac{dy}{dx} = \frac{y}{x}$

9. If $x\sqrt{1+y}+y\sqrt{1+x}=0$, $-1<x<1$, prove that $\frac{dy}{dx}=-\frac{1}{(1+x)^2}$

10. If $y=\sqrt{x+\sqrt{x+\sqrt{x+.....\infty}}}$, then find $\frac{dy}{dx}$.

11. If $(\cos x)^y=(\sin y)^x$, then find $\frac{dy}{dx}$.

ANSWERS

1. k = -1	**2** $a=3, b=2$	**3.** $a=\frac{1}{2}$, $b=4$

(DAY -6 :- 25/10/2023)

APPLICATION OF DERIVATIVES

1. Find the intervals in which function f(x) = $2x^3 - 15x^2 + 36x + 1$ is strictly increasing or strictly decreasing.

2. Find the intervals in which function *f(x) = sin x - cos x*, $0 \le x \le 2\pi$, is strictly increasing or strictly decreasing.

3. . Find the absolute maximum and minimum values of a function *f* given by

***f* (*x*) = $2x^3 - 15x^2 + 36x + 1$ on the interval [1, 5].**

4. A man whose height is 2 m walks at a uniform speed of 6 m/minutes away from a lamp post 5 m high. Find the rate at which the length of his shadow increases.

5. Water is leaking from a conical funnel at the rate of 5 cm^2 /s. If the radius of the base of the funnel is 5 cm and the altitude is 10 cm, find the rate at which the water level is dropping when it is 2.5 cm from the top.

6. The length *x* of a rectangle is decreasing at the rate of 3 cm/minute and the width *y* is increasing at the rate of 2cm/minute. When *x* =10cm

and y = 6cm, find the rates of change of (a) the perimeter and (b) the area of the rectangle.

7. The volume of a cube is increasing at the rate of 8 cm^3/s. How fast is the surface area increasing when the length of an edge is 12 cm?

8. Show that the volume of the largest cone that can be inscribed in a sphere of radius R is 8/27 of the volume of the sphere.

9. 17. Show that semi-vertical angle of right circular cone of given surface area and maximum volume is $Sin^{-1}(1/3)$.

10. An open box with a square base in to be made out of a given quantity of sheet of area c^2.Show that the maximum volume of the box is $\frac{c^3}{6\sqrt{3}}$.

11. A rectangular sheet of tin 45 cm by 24 cm is to be made into a box without top by cutting off squares from each corner and folding up the flaps. What should be the side of the square to be cut off so that the volume of the box is the maximum possible?

12. Find the interval in which the function f given by $f(x) = x^2e^{-x}$ *is* strictly increasing.

(DAY -7 :-

26/10/2023)

INDEFINITE & DEFINITE INTEGRALS

1. 1. $\int \frac{1}{\sqrt{x}+x}\,dx$ 2. $Evluate: \int \sqrt{\tan x}\ dx$

3. $\int \frac{1}{sin(x-a).cos(x-b)}dx$ 4. $\int tanx.tan2x.tan3x\,dx$

5. $\int \frac{sinx-xcosx}{x(x+sinx)}\ dx$ 6. $\int \frac{1}{\left(\sqrt{x}+\sqrt[3]{x}\right)}\ dx$ 7. $\int \frac{x^4+1}{x^2+1}dx$ 8. $\int \frac{x\sin^{-1}x}{\sqrt{1-x^2}}dx$

9. $\left(\int e^{2x}\frac{1+sin2x}{1+cos2x}\right)dx$ 10. $\int \frac{sec^4x}{\sqrt{tanx}}\,dx$ 11. $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \sqrt{1+sin2x}\,dx$

12. If $\int_a^b x^3dx = 0$ and if $\int_a^b x^2dx = \frac{2}{3}$ find a and b.

13.

$$Evaluate: \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} cosx\,.\,log(sinx)dx$$

14. $Evaluate: \int_1^3 (|x-1| + |x-2| + |x-3|)dx$

15.

$$\int_0^{\pi/4} \log(1+\tan x)\,dx$$

16. Prove that: $\int_0^{\frac{\pi}{2}} sin2x\,.\,log(tanx)dx = 0$

17. Evaluate:

$$\int_0^{\frac{\pi}{2}} \frac{x\,sinx}{1+cos^2x}dx$$

18. $Evaiuate: \int_{-2}^{2} \frac{x^2}{1+5^x}dx$

19.

$$\int_0^{\frac{\pi}{2}} 2sinx.cosx.\tan^{-1}(sinx)\,dx$$

20. $\int_0^1 \frac{log(1+x)}{1+x^2}\,dx$

Answer

1. $2\log_e\left|1+\sqrt{x}\right|+C$ 2. $\frac{1}{\sqrt{2}}\tan^{-1}(\frac{tanx-1}{\sqrt{2tanx}} + \frac{1}{2\sqrt{2}}log|\frac{tanx-\sqrt{2tanx}+1}{tanx+\sqrt{2tanx}+1}| + c$

3. $\frac{1}{cos(x-b)}[\,logsin(x-a) - cos(x-b)] + c$

4. $\frac{1}{3}logcos3x + \frac{1}{2}logcos2x + logcosx + c$ 5. log x- log(x+sinx)+c

6. $2\sqrt{x}$ -3$\sqrt[3]{x}$+6$x^{\frac{1}{6}}$-6log$(x^{\frac{1}{6}}+1) + c$ 7. $\frac{x^3}{3} - x + 2\tan^{-1}x + c$

8. - $\sqrt{1-x^2}\sin^{-1}x$ +x+c 9. $\frac{1}{2}e^{2x}$ tanx +c 10. $2\sqrt{tanx}$ +$\frac{2}{5}tan^{\frac{5}{2}}x$+c

11. $\sqrt{2}$ -1 12. A=-1, b=1 13. $\frac{1}{4}log2 - \frac{\pi}{8} + \frac{1}{4}$ 14. 5 15. $\frac{\pi}{8}$ log 2

17. $\frac{\pi^2}{4}$ 18. $\frac{8}{3}$ 1 9. $\frac{\pi}{2} - 1$ 20. $\frac{\pi}{8}log2$

(DAY -8 :- 27/10/2023)

APPLICATION OF INTEGRATION

1. Find the area enclosed by the circle $x^2 + y^2 = 2$.
2. Find the area of the region bounded by the curve $y = x^2$ and the line $y = 16$.
3. Find the area of the region bounded by the curve $y = \sqrt{16 - x^2}$ and x-axis.
4. Find Area of the region bounded by $y^2 = 4x$, y-axis, and the line y = 3.
5. Find The area of the region bounded by the curve x = 2y + 3 and the y lines,

   y = 1 and y = -1

6. Sketch the region of the ellipse $\frac{x^2}{25} + \frac{y^2}{16} = 1$ and find its area, using integration.
7. Sketch the graph of y = $|x+3|$ and evaluate the area under the curve y = $|x+3|$ above x-axis and between x = - 6 to x = 0. using integration.
8. Find the area of the region bounded by $x^2 = 4y$, y = 2, y = 4 and the y-axis in the first quadrant using integration
9. Find the Areaof Triangle having vertices A (2 , 3) , B (4 , 7) C (6 , 2)
10. Find the Area of Triangle bounded by lines :- 3x +3 - 2y = 0 , x + 2y -7 = 0 , x-2y+1=0

Answers:

1. 2π sq units
2. $\frac{256}{3}$ sq units
3. 8π sq units
4. $\frac{9}{4}$ sq units

5. **6 sq units**
6. 20π **sq units**
7. **9 Sq. units**
8. $16 - 4\sqrt{2}\ sq.units$
9. **9 sq units**
10. **4 sq units**

(DAY -9 :-

28/10/2023)

DIFFERENTIAL EQUATIONS

1. **Find the particular solution of the differential equation** $(1+e^{2x})dy+(1+y^2)e^x=0$**; given that y=1 and x=0**
2. **Find the particular solution of the differential equation** $\log\left(\frac{dy}{dx}\right)=3x+4y,$ **given that y=0 when x=0**
3. **Solve the following differential equation :** $\left(x\sin^2\frac{y}{x}-y\right)dx+xdy=0$
4. **Solve the following differential equation :** $xdy-ydx=\sqrt{x^2+y^2}\,dx$
5. **Find the solution of the differential equation** $(xdy-ydx)y\sin\left(\frac{y}{x}\right)=(ydx+xdy)x\cos\left(\frac{y}{x}\right)$
6. **Solve the following differential equation:** $x\log x\frac{dy}{dx}+y=\frac{2}{x}\log x$
7. **Solve the differential equation:** $x\frac{dy}{dx}+y-x+xy\cot x=0, x\neq 0$
8. **Find the particular solution of the differential equation**

$\frac{dy}{dx} + y\cot x = 2x + x^2 \cot x, x \neq 0$ **given that y= 0 and x = pie / 2**

9. Find the general solution of the differential equation

$ydx - (x + 2y^2)dx = 0$

10.. solve the differential equation

$(\tan^{-1} y - x)dy = (1 + y^2)dx$

Answer

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1. $\tan^{-1} y + \tan^{-1} e^x = \frac{\pi}{2}$ **2.** $4e^{3x} + 3e^{-4y} = 7$ **3.** $\cot\left(\frac{y}{x}\right) = \log|x| + c$

(b) $y + \sqrt{x^2 + y^2} = cx^2$ **5.** $\sec\left(\frac{y}{x}\right) = cxy$

6. $y\log x = -\frac{2}{x}(1 + \log x) + c$ **7.** $y = \frac{1}{x} - \cot x + \frac{c}{x\sin x}$

8. $y = x^2 - \frac{\pi^2}{4\sin x}, \sin x \neq 0$ **9.** $x = 2y^2 + cy$

10. $x = (\tan^{-1} y - 1) + ce^{-\tan^{-1} y}$

(DAY -10 :- 29/10/2023)

VECTOR ALGEBRA

1.Write a vector of magnitude 15 units in the direction of vector $\hat{i} - 2\hat{j} + 2\hat{k}$ **.**

2. .Find $\vec{a}.\vec{b}$ **if** $\vec{a} = 3\hat{i} - \hat{j} + 2\hat{k}$ **and** $\vec{b} = 2\hat{i} + 3\hat{j} + 3\hat{k}$ **.**

3. If $\vec{a}$ **and** $\vec{b}$ **are two vectors such that** $|\vec{a} . \vec{b}| = |\vec{a} \times \vec{b}|$**, then what is the angle between** $\vec{a}$ **and** $\vec{b}$

4. If $|\vec{a}| = 3$, $|\vec{b}| = 5$ and $\vec{a} \cdot \vec{b} = 9$. Find $|\vec{a} \times \vec{b}|$

5. The dot products of a vector with the vectors $\hat{i} - 3\hat{j}$, $\hat{i} - 2\hat{j}$ and $\hat{i} + \hat{j} + 4\hat{k}$ are 0 , 5 and 8 respectively. Find the vector.

6. If $\vec{a} = 2\hat{i} + 2\hat{j} + 3\hat{k}$, $\vec{b} = -\hat{i} + 2\hat{j} + \hat{k}$ and $\vec{c} = 3\hat{i} + \hat{j}$ are such that $\vec{a} + \lambda\vec{b}$ is

perpendicular to $\vec{c}$, find the value of λ.

7. If $|\vec{a} + \vec{b}| = |\vec{a} - \vec{b}|$, then find the angle between $\vec{a}$ and $\vec{b}$.

8. Let $\vec{a}$, $\vec{b}$, $\vec{c}$ be three vectors such that $|\vec{a}| = 3, |\vec{b}| = 4, |\vec{c}| = 5$ and each of them being perpendicular to the sum of the other two, find $|\vec{a} + \vec{b} + \vec{c}|$.

9. If with reference to the right handed system of mutually perpendicular unit vectors $\hat{i}, \hat{j}$ and $\hat{k}$, $\vec{\alpha} = 3\hat{i} - \hat{j}$, $\vec{\beta} = 2\hat{i} + \hat{j} - 3\hat{k}$ then express $\vec{\beta}$ in the form of $\vec{\beta}_1 + \vec{\beta}_2$, where $\vec{\beta}_1$ is parallel to $\vec{\alpha}$ and $\vec{\beta}_2$ is perpendicular to $\vec{\alpha}$.

10. If $\vec{a} = 4\hat{i} + 5\hat{j} - \hat{k}, \vec{b} = \hat{i} - 4\hat{j} + 4\hat{k}, \vec{c} = 3\hat{i} + 4\hat{j} - \hat{k}$, then find a vector $\vec{d}$ perpendicular to both $\vec{c}$ and $\vec{b}$ and $\vec{d} \cdot \vec{a} = 21$

ANSWERS

1 5 ($\hat{i} - 2\hat{j} + 2\hat{k}$

2 . $\vec{a} \cdot \vec{b} = 9$ 3. $\frac{\pi}{4}$ 4. 12

5. $15\hat{i} + 5\hat{j} - 3\hat{k}$ 6. 8 7. $\frac{\pi}{2}$ 8. $5\sqrt{2}$

9. $\vec{\beta}_1 = \frac{1}{2}(3\hat{i} - \hat{j})$, $\vec{\beta} = \frac{1}{2}\hat{i} + \frac{3}{2}\hat{j} - 3\hat{k}$ 10 $-\frac{1}{3}(\hat{i} - 16\hat{j} - 13\hat{k})$.

SUBJECT – PHYSICAL EDUCATION

- Motor Fitness Test (7 test conducted)
- General Motor Fitness(3 test Conducted)

- **Measurement of Cardio-Vascular Fitness – Harvard Step Test/Rockport Test –**

Computation of Fitness Index

Practical-2: **Procedure for Asanas, Benefits & Contraindication for any two Asanas for eachlifestyle disease.**

Asanas as preventive measures

- **Obesity**
- **Hypertension**

Anyone game of your choice out of the list above. Labelled diagram of field & equipment (Rules,Terminologies & Skills).

- **Basketball, Football, Kabaddi, Kho-Kho, Volleyball, Handball, Hockey, Cricket, Bocce & UnifiedBasketball [CWSN (Children With Special Needs – Divyang)]***

सभी विद्यार्थी मन लगाकर पढ़ें साथ ही त्योहारों का आनंद लें

सभी को आशीर्वाद और शुभकामनाएं