SAVITRI DEVI DAV PUBLIC SCHOOL, JAMTARA

SUMMER VACATION ASSIGNMENT- (2023-24)

CLASS: XII SCIENCE

SUBJECT: ENGLISH

1. Explore the following concepts and write a brief note in your own words. Note that all these concepts will be helpful in understanding the chapters/poems.

- Socialism
- Romanticism
- Feminism
- Racism
- Casteism
- Satire
- Patriarchy
- Dramatic Irony

2. Words not only reflect the history of a country, but also the many and diverse cultural and linguistic influences which have shaped and changed the English language in India. Figure out 10 Indian words that have been recently added to the Oxford English Dictionary (OED). Write the meaning in English alongside.

3.Watch any (or all!) of the following movies and pen down a review concentrating on the plot, historical/political background, creative elements, characterization and theme in not more than 200 words.

- Schindler's List, 1993
- Dead Poets Society, 1989
- Modern Times, 1936
- The Namesake, 2006
- Gandhi, 1982

4. Practice the following writing skills:

i. Invitation letter
ii. Classified advertisements
iii. Colourfulposters

5. Read the chapters:

'The Third Level' (Vistas)
Lost Spring (Flamingo)

Identify the theme of the chapter and write it in your own words (Word Limit: 100 words)

6. Make one comparative study between Franco Prussian war and Russia Ukraine war.

Beside this collect information on the specific topics related to these places

i. Life style
ii. Places for traveling
iii. Culture
iv Geographical conditions
v. Pictures of the places

Q 7. Plan a visit to one of your places of interest during the upcoming Summer Break. Narrate the experiences of your stay at the place and your interactions with the people there. Mention about the best attractions of the place, its weather conditions and height from sea level & other specialities of the place.

SUBJECT: PHYSICS

1. A point charge Q is placed at point O as shown in the figure. Is the potential difference VA – VB positive, negative or zero, if Q is

(i) positive
(ii) negative?

2. Distinguish between tor. dielectric and a conductor .
3. Two point charges, q1 = 10 × 10-8C, q2 = -2 × 10-8C are seperated by a distance of 60 cm in air.

(i) Find at what distance from the 1st charge, q1 would the electric potential be zero.

(ii) Also calculate the electrostatic potential energy of the system.

4. Two point charges 4Q, Q are separated by lm in air. At what point on the line joining the charges is the electric

5. Two point charges A and B, having charges +Q and -Q respectively, are placed at certain distance apart and force acting between them is F. If 25% charge of A is transferred to B, then force between the charges becomes.

6. The electrostatic force on a small sphere of charge 0.4μC due to another small sphere of charge −0.8μC in air is 0.2 N.

(a) What is the distance between the two spheres?

(b) What is the force on the second sphere due to the first?

7. (a) Two insulated charged copper spheres A and B have their centres separated by a distance of 50 cm. What is the mutual force of electrostatic repulsion if the charge on each is 6.5×10−7 C? The radii of A and B are negligible compared to the distance of separation.

(b) What is the force of repulsion if each sphere is charged double the above amount, and the distance between them is halved?

8.Two similarly and equally charged identical metal spheres A and B repel each other with a force of $2\times10-5$N. A third identical uncharged sphere C is touched with A and then placed at the midpoint between A and B. Find the net electric force on C :

9. Charge Q, is divided into two parts which are then kept some distance apart. The force between them will be maximum if the two parts are having the charge.

10.The electrostatic force on a small sphere of charge $0.4\mu C$ due to another small sphere of charge $-0.8\mu C$ in air is 0.2 N.

(a) What is the distance between the two spheres?

(b) What is the force on the second sphere due to the first?

11. Activity: 1. To assemble a household circuit comprising three bulbs, three (on/off) switches, a fuse and a power source.
2. To assemble the components of a given electrical circuit.

SUBJECT: CHEMISTRY

Answer the following questions.

1.(a) Explain the following phenomena with the help of Henry's law.

(i) Painful condition known as bends.

(ii) Feeling of weakness and discomfort in breathing at high altitude.

(b) Why does soda water bottle kept at room temperature fizzes on opening?

2. Define the following modes of expressing the concentration of a solution. Which of these modes are independent of temperature and why?

(i) w/w (mass percentage)

(ii) V/V (volume percentage)

(iii) w/V (mass by volume percentage)

(iv) ppm. (parts per million)

(v) x (mole fraction)

(vi) M (Molarity)

(vii) m (Molality)

3. Components of a binary mixture of two liquids A and B were separated by distillation. After some time separation of components stopped and the composition of the vapour phase became the same as that of the liquid phase. Both the components started coming in the distillate. Explain why this happened.

4. Calculate the freezing point of a solution containing 60 g of glucose (Molar mass = 180 g mol-1) in 250 g of water.

(Kf of water = 1.86 K kg mol-1)

5. (a) Measurement of osmotic pressure method is preferred for the determination of molar masses of

(b) Aquatic animals are more comfortable in cold water than in warm water.

(c) Elevation of the boiling point of 1M KCl solution is nearly double than that of 1M sugar solution.

6. Consider a cell given below

$Cu\ |Cu^{2+}\ ||\ Cl^-\ |\ Cl_2,\ Pt$

Write the reactions that occur at anode and cathode.

7. What is Nernst equation ? write the Nernst equation for the reaction.

$$2Cr(s) + 3Cd2+\ (aq) \rightarrow 2Cr3+\ (aq) + 3Cd\ (s)$$

8. What is van't Hoff factor? what possible values can it have if the solute molecules undergo dissociation.

9. Define the terms osmosis and osmotic pressure. Is osmotic pressure of a solution is a colligative property ?explain.

10. Calculate the boiling point of a solution prepared by adding 15.00gram of NaCl to 225.0 gram of water (Kb for water =0.512 kelvin kg per mole , molar mass of NaCl = 58.4 gram).

11. The properties of the solutions which depend only on the number of solute particles but not on the nature of the solute are called colligative properties. Relative lowering in vapour pressure is also an example ofcolligative properties.

For an experiment, sugar solution is prepared for which lowering in vapour pressure was found to be 0.061 mm of Hg. (Vapour pressure of water at 200C is 17.5 mm of Hg)

(i) Relative lowering of vapour pressure for the given solution is

(a) 0.00348 (b) 0.061 (c) 0.122 (d) 1.75

(ii) The vapour pressure (mm of Hg) of solution will be

(a) 17.5 (b) 0.61 (c) 17.439 (d) 0.00348

(iii) Mole fraction of sugar in the solution is

(a) 0.00348 (b) 0.9965 (c) 0.061 (d) 1.75

(iv)If weight of sugar taken is 5 g in 108 g of water then molar mass of sugar will be

(a) 358 (b) 120 (c) 240 (d) 400

(v) The vapour pressure (mm of Hg) of water at 293K when 25g of glucose is dissolved in 450 g of water is

(a) 17.2 (b) 17.4 (c) 17.120 (d) 17.02

SUBJECT: MATHEMATICS

(DIFFERENTIATION)

1. Find $\frac{dy}{dx}$ for the following:

(a) $y=\frac{1}{\sqrt{a^2-x^2}}$ (b) $y=\frac{5x}{\sqrt[3]{1-x^2}}+\sin^2(2x+3)$ (c) $y=\frac{\cos x+\sin x}{\cos x-\sin x}$

(d) $y=\log\sqrt{\frac{1+\cos^2 x}{1-e^{2x}}}$ (e) $y=\log(x+\sqrt{1+x^2})$ (f) $y=\sqrt{\frac{1-\sin 2x}{1+\sin 2x}}$

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

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

4. If $y=\left(x+\sqrt{x^2+a^2}\right)^n$, prove that $\frac{dy}{dx}=\frac{ny}{\sqrt{x^2+a^2}}$.

5. If $y=\sqrt{x}+\frac{1}{\sqrt{x}}$, prove that $2x\frac{dy}{dx}+y=2\sqrt{x}$.

6. If $y\log x=x-y$, prove that $\frac{dy}{dx}=\frac{\log x}{(1+\log x)^2}$.

7. If $\log\left(\sqrt{x^2+y^2}\right)=\tan^{-1}\frac{y}{x}$, prove that $\frac{dy}{dx}=\frac{x+y}{x-y}$.

8. If $y=\frac{\sin^{-1}x}{\sqrt{1-x^2}}$, prove that $\left(1-x^2\right)\frac{dy}{dx}=xy+1$.

9. If $y=x^{\cos x}+\cos x^{\sin x}$, find $\frac{dy}{dx}$.

10. If $x^a y^b=(x+y)^{(a+b)}$, prove that $\frac{dy}{dx}=\frac{y}{x}$.

11. If $x=a\sin 2t(1+\cos 2t), y=b\cos 2t(1-\cos 2t)$, show that $\left(\frac{dy}{dx}\right)_{at\,t=\frac{\pi}{4}}=\frac{b}{a}$.

12. If $x=2\cos\theta-\cos 2\theta$ and $y=2\sin\theta-\sin 2\theta$, find $\left(\frac{d^2y}{dx^2}\right)_{\theta=\frac{\pi}{2}}$.

(MATRICES)

1. Find the order of the matrix A such that $\begin{bmatrix} 2 & -1 \\ 1 & 0 \\ -3 & 4 \end{bmatrix} A = \begin{bmatrix} -1 & -8 \\ 1 & -2 \\ 9 & 22 \end{bmatrix}$.

2. If $B = \begin{bmatrix} 1 & -5 \\ 0 & -3 \end{bmatrix}$ and $A + 2B = \begin{bmatrix} 0 & 4 \\ -7 & 5 \end{bmatrix}$, find the matrix A.

3. If the matrix $A = \begin{bmatrix} 0 & 6-5x \\ x^2 & x+3 \end{bmatrix}$ is symmetric, find the value of x.

4. If $A = \begin{bmatrix} 3 & 4 & 2 \\ 0 & 2 & -3 \\ 1 & -2 & 6 \end{bmatrix}$, find A^{-1}.

5. For the matrix $A = \begin{bmatrix} 1 & 5 \\ 6 & 7 \end{bmatrix}$, verify that

   (i) $(A + A')$ is a symmetric matrix.

   (ii) $(A - A')$ is a skew-symmetric matrix.

6. If $B = \begin{bmatrix} 1 & -5 \\ 0 & -3 \end{bmatrix}$ and $A + 2B = \begin{bmatrix} 0 & 4 \\ -7 & 5 \end{bmatrix}$, find the matrix A.

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7. If $A = \begin{bmatrix} 1 & 0 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 2 \\ 5 \\ 6 \end{bmatrix}$, find AB.

8. If $A = \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}$, then A^2 equals

   (a) $\begin{bmatrix} 2 & -2 \\ -2 & 2 \end{bmatrix}$ (b) $\begin{bmatrix} 2 & -2 \\ -2 & -2 \end{bmatrix}$ (c) $\begin{bmatrix} -2 & -2 \\ -2 & 2 \end{bmatrix}$ (d) $\begin{bmatrix} -2 & 2 \\ 2 & -2 \end{bmatrix}$

SUBJECT: BIOLOGY

1. Emasculation is not necessary in unisexual flowers but still bagging is necessary during artificial hybridization. justify.

2. Describe along with diagrams, the development of a megaspore into 7- celled 8-nucleated embryo sac in an angiosperm.

3. Draw diagrammatic sectional view of a mature anatropous ovule and label the following parts in it -

a)That develops into fruit . b)That develops into embryo after fertilization .

c) That develops into an endosperm in an albuminous seed . d) That attached the ovule to the placenta.

4. If a spermatogonium contents 24 chromosomes, what will be the number of chromosomes in

a)Spermatids and b)primary spermatocytes respectively.

5. Describe the events that take place in the ovaries and uterus during the secretory phase of menstrual cycle.

6. Now there are hundreds of sperms around the ovum; only one succeeds in fertilizing the ovum. How?

7. Meiotic division during oogenesis is different from that in spermatogenesis, explain how and why?

8. a) Why do the people infected with STDs not approach a doctor for timely treatment?

b) write the complications that untreated STDs lead to.

9. There are no side effects in natural methods of contraception, Explain.

10. Expand IUDs. Name the different types of IUDs and give two examples of each of them.

11. Case Study

Amniocentesis is a technique in which the amniotic fluid is collected from the uterus with the help of a needle to determine any genetic abnormalities in the foetus by analysing the chromosomal patterns. This technique was being misused to know the gender of the foetus and if the foetus was a girl, it was aborted. To stop the female foeticide, amniocentesis was banned under Prenatal Diagnostics Technique Act in the year 1994.

a)What is an Amniocentesis Test?
b)Why amniocentesis should be banned in our country?
c) Write the advantages of Amniocentesis.
d) Why should sex education be introduced to school-going children?

SUBJECT: INFORMATICS PRACTICES

Solve all the answers in a Thin Copy

WORKSHEET ON SERIES

Q1. What will be the output of the given code?

(a)
```
import pandas as pd
s = pd.Series([1,2,3,4,5], index=['akram','brijesh','charu','deepika','era'])
print(s['charu'])
```

(b)
```
import pandas as pd
S1=pd.Series([5,6,7,8,10],index=['v','w','x','y','z'])
l=[2,6,1,4,6]
S2=pd.Series(l,index=['z','y','a','w','v'])
print(S1-S2)
```

(c) import pandas as pd
```
s=pd.Series([1,2,3,4,5,6],index=['A','B','C','D','E','F'])
print(s[s%2==0])
```

Q2. Assuming the given series, named stud, which command will be used to print 5 as output?

Amit	90
Ramesh	100
Mahesh	50
john	67
Abdul	89

Q3. Consider the following series named animal:

L	LION
B	BEAR
E	ELEPHANT
T	TIGER
W	WOLF

Write the command to create the Series and output of the command:
```
print(animal[::-3])
```

Q4. Hitesh wants to display the last four rows of the data frame df and has written the following code : df.tail()
But the last 5 rows are being displayed.
Identify the error and rewrite the correct code so that the last 4 rows get displayed.

Q5. Consider the following Series object, S_amt

Table	350
Chair	200
Sofa	800
Stool	150

i. Write the command which will display the name of the furniture having rent>250
ii. Write the command to name the series as Furniture.

Q6. Consider two objects x and y. x is a list whereas y is a Series.
Both have values 20, 40,90, 110.
What will be the output of the following two statements considering that the above objects have been created already
a. print (x*2) b. print(y*2)
Justify your answer.

Q7. Write a program to create a series object using a dictionary that stores the number of students in each house of class 12 of your school. Note: Assume four Subjects names are Bio , Chemistry, IP and Maths having 18, 2, 20, 18 students respectively and pandas library has been imported as pd.

Q8. What will be the output of the following code:
```
>>>import pandas as pd
>>>A=pd.Series(data=[35,45,55,40])
>>>print(A>45)
```

SUBJECT: PHYSICAL EDUCATION

Case Study Question

1.

Clubs.	Matches	Won.	Drawn.	Lost	Points
ATK Mohun Bagan.	20	10.	7.	3.	37
Bengaluru FC.	20.	8	5.	7	29
Chennaiyin FC	20.	5	5	10.	20
FC Goa.	20	4.	7.	9	19
Hyderabad FC.	20	11	5.	4	38
Jamshedpur FC	20.	13.	4	3.	43
Kerala Blasters FC.	20	9	7.	4	34
Mumbai City FC.	20	9	4	7	31
NorthEast UFC	20.	3.	5	12.	14
Odisha FC	20.	6	5.	9	23
SC East Bengal	20.	1	8	11	11

a. Based on the table given above place the teams according to their ranking

b. List down two advantages of this kind of tournament

c. Write down the formula for calculating points

2. XYZ School is conducting an invitation tournament in which 25 teams have sent their entries. Matches have to be conducted on a knockout basis.

a. How many total matches will be played?

b. How many matches will be played in the first round of the tournament?

c. How many rounds will be played?

d. Which team will get 4th bye of the tournament?

Art Integration

1. Prepare a report on the Annual Sports Day of your school for publishing in a National daily.

2. Your School is hosting CBSE Regional Sports Meet. Plan and present a Folk Dance for the Opening Ceremony.