

D.A.V. PUBLIC SCHOOL, BISTUPUR, JAMSHEDPUR
SUMMER HOLIDAY HOME WORK
SESSION: 2018 - 19
STD: XII

English:

1. Draft Advertisements for the following (2 each)

- A. Household items for sale
- B. To- let
- C. Required/ Vacancy
- D. Matrimony

2. Write an article on---- Language as a means of suppression (ref:- The Last Lesson)

3. Water is precious and each one of us must stop wastage. Prepare a poster in not more than 50 words urging people to employ various methods of rainwater harvesting in their colonies.

4. Recently you went to your native village to visit your grandparents. You saw that some of the children in the age group 5- 14 (the age at which they should have been at school) remained at home, were working in the fields or were simply loitering in the streets. Write a letter in 120- 150 words to the editor of a national daily analyzing the problem and offering solutions to it.

5. Bring out the elements of satire, irony and humour from the chapter 'The Tiger King'.

6. What was Dr. Sadao's dilemma? Do you agree that his final solution was the best under the circumstances?

Mathematics:

1. If $y = (\cos x)^x + (x \sin x)^{\frac{1}{x}}$, find $\frac{dy}{dx}$.

2. If $y^x + x^y + x^x = a^b$, find $\frac{dy}{dx}$.

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

4. If $x = a \sin 2t(1 + \cos 2t)$ and $y = b \cos 2t(1 - \cos 2t)$, find $\frac{dy}{dx}$ at $t = \frac{\pi}{4}$.

5. If $x = \cos t(3 - 2 \cos^2 t)$ and $y = \sin t(3 - 2 \sin^2 t)$, find $\frac{dy}{dx}$ at $t = \frac{\pi}{4}$.

6. Find $\frac{dy}{dx}$ for $y = \tan^{-1}\left(\frac{\sin x}{1 + \cos x}\right)$, $-\pi < x < \pi$.

7. Differentiate $\sin^{-1}\left\{\frac{2^{x+1} \cdot 3^x}{1 + (36)^x}\right\}$ with respect to x .

8. If $y = \{\log_{\cos x} \sin x\} \{\log_{\sin x} \cos x\}^{-1} + \sin^{-1}\left(\frac{2x}{1+x^2}\right)$, find $\frac{dy}{dx}$ at $x = \frac{\pi}{4}$.

9. If $x = a\left(\cos t + \log \tan \frac{t}{2}\right)$ and $y = a \sin t$, evaluate $\frac{d^2y}{dx^2}$ at $t = \frac{\pi}{4}$.

10. If $x = \left\{\log(x + \sqrt{x^2 + 1})\right\}^2$, then find the value of $(1 + x^2) \frac{d^2y}{dx^2} + x \frac{dy}{dx}$.

11. If $x = \cos \theta$ and $y = \sin^3 \theta$, prove that $y \frac{d^2 y}{dx^2} + \left(\frac{dy}{dx} \right)^2 = 3 \sin^2 \theta (5 \cos^2 \theta - 1)$.

12. Find the inverse of the matrix using elementary operations:
$$\begin{bmatrix} 1 & 2 & 0 \\ 2 & 3 & -1 \\ 1 & -1 & 3 \end{bmatrix}$$

13. The monthly incomes of Aryan and Babbar are in the ratio 3:4 and their monthly expenditures are in the ratio 5:7. If each saves rupees 1500 per month, find their incomes using matrix method.

14. Prove that every square matrix can be expressed as the sum of a symmetric and a skew-symmetric matrix and hence express the matrix given below as the sum of a symmetric and a skew-symmetric matrix:

$$\begin{bmatrix} 2 & 4 & -1 \\ 3 & 5 & 8 \\ 1 & -2 & 1 \end{bmatrix}$$

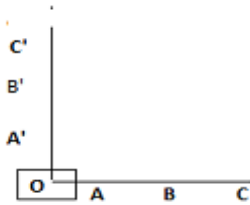
15. If A is a square matrix, then prove that $(A^n)' = (A^n)'$, $\forall n \in N$.

Physics:

1. A polythene rubbed with wool is found to have negative charge of $0.3 \mu\text{C}$. Estimate the number of electrons transferred. Is there a transfer of mass from wool to polythene.
2. Calculate the total positive charge on a copper penny of mass 3.11 g . (atomic mass of $\text{Cu} = 63.5$) assuming one excess electron per atom.
3. If a charge q is placed at the centre of the line joining two equal charges Q , such that the system is in equilibrium, then how Q and q are related.
4. Why electric field lines never cross each other. Why they always comes out normally from the surface of a conductor.
5. Draw field lines when a point charge when is held near an infinite sheet of charge.
6. An electric di-pole of length 10 cm consists of charges $\pm 6 \text{ mC}$, placed at 30° with respect to a uniform electric field, experiences a torque equal to $6\sqrt{3} \text{ Nm}$. Find the strength of electric field and potential energy stored in the di-pole.
7. Show that the electric field at the surface of a charged conductor is given by $\vec{E} = \frac{\sigma}{\epsilon_0} \hat{n}$, where σ is the surface density of charge and \hat{n} is a unit vector normal to the surface in the outward direction.

8. The following data was obtained for the dependence of the magnitude of electric field with distance from a reference point 'O', within the charge distribution in the box region around 'O'.

Field point	A	B	C	A'	B'	C'
Magnitude of Electric field	E	E/8	E/27	E/2	E/16	E/54



Given that $OA = AB = BC = OA' = A'B' = B'C' = L$. Identify the Distribution of charge and justify your answer. If the potential due to this distribution is V at the point A then what is its value at A' .

9. Draw equi-potential surfaces for a pair of charges q_1 and q_2 such that, a) $q_1q_2 > 0$, b) $q_1q_2 < 0$.

Explain with reasons.

10. Two identical charged spheres are suspended by strings of equal lengths at a common point from a fixed rigid support. The strings make an angle θ with each other. when suspended in a liquid of density 0.8 g/cc the angle remains the same. If density of the material of sphere is 1.6 g/cc, what is the dielectric constant of the liquid.

11. Let $\rho(r) = \frac{Qr}{\pi R^4}$, be the charge density distribution for a solid sphere of radius R and total charge Q .

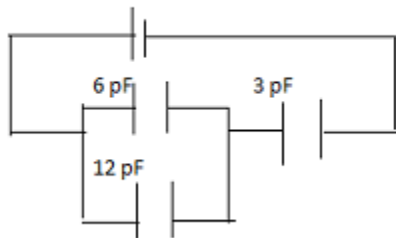
For a point P inside the sphere at a distance r_1 from the centre, find the magnitude of the electric field at P.

12. Two identical charged spheres suspended from a common point by two massless strings of length l are initially at a distance d ($d \ll l$) are apart because of their mutual repulsion. The charge begins to leak from both spheres at a constant rate. As a result the charges approach each other with a constant velocity v . Then how velocity depends as a function of distance x .

13. Three unknown charges q_1, q_2 and q_3 exert forces on each other. When q_1 and q_2 are 15 cm apart (q_3 absent), they attract each other with a force of 14 mN. When q_2 and q_3 are 20 cm apart (q_1 absent) they attract with a force of 38 mN. When q_1 and q_3 are 10 cm apart (q_2 absent) they repel each other with a force of 52 mN. Find the magnitude and sign of each charge.

14.

9.



If the in the 6 pF capacitor is 'E' then find energy stored in other two capacitors.

15. A parallel plate capacitor is designed to be with a voltage rating 1 kV using a di-electric constant of 3 and di-electric strength about 10^7 V/m. For safety the field should never exceed 10% of the di-electric strength. What minimum area of the plates is required to have a capacitance 50 μ F.

NOTE : STUDENTS MUST SOLVE THE ABOVE QUESTIONS IN A SEPARATE NOTE BOOK AND ALSO THEY MUST SOLVE THE NCERT EXERCISE 1 AND 2 IN THE SAME NOTE BOOK

Chemistry:

1. An element has a B.C.C. lattice with cell edge of 288 pm. The Density of the element is 7.2 g/cc. How many elements are present in 208 gm of the element?

2. Analysis shows that Nickel Oxide has the formula $\text{Ni}_{0.96}$ and $\text{O}_{1.00}$. What fractions of nickel exist as Ni^{2+} and Ni^{3+} ions.

3. If radius of Octahedral Void is r and the radius of atoms in close packing is R , Derive a relation between r and R .

4. Explain the following terms.

(i) Ferromagnetism.

(ii) Antiferromagnetism.

(iii) Ferrimagnetism.

5. What are 12-16 and 13-15 compounds.

6. Why AgBr shows both Schottky and Frenkel Defect?

7. Why window panes over the years become thick at the bottom and thin at the top?

8. Why do persons living at higher altitudes develop Anoxia.

9. Find the mass % of benzene in Toluene if the mole fraction of benzene is 0.5
10. Define Raoult's law of volatile liquid containing non-volatile solute. Also account for positive and negative deviation with examples.
11. A 5% solution of glucose is isotonic with 0.577% of non-volatile solute. Find molar mass of NVS.
12. Calculate the osmotic pressure in pascals exerted by a solution prepared by dissolving 1 gm of polymer of molar mass 185000 in 450 ml of water.
13. Vapour pressure of pure water at 298 K is 23.8 mm Hg. 50 gm of urea is dissolved in 850 gm of water. Calculate the vapour pressure of water for this solution and its relative lowering.
14. Define Henry's law and discuss its limitations.
15. 19.5 gm of CH_2FCOOH is dissolved in 500 gm of water. The depression in freezing point observed is 1°C . Calculate the Van't Hoff factor and dissociation constant of acid?
15. If the solubility product of CuS is 6×10^{-16} , calculate the maximum molarity of CuS in aqueous solution.
16. What are abnormal molecular masses. Explain the derivation of Degree of Dissociation and Degree of Association.

Biology:

Investigatory project on the respective syllabus. It must include case study

Bio Tech:

To prepare investigatory project file based on any one of the topics given in textbook of biotechnology.

Computer Science:

- Define a class named HOUSING in C++ with the following descriptions:
 Private Members:
 REG_NO integer (Ranges 10-1000)
 NAME Array of characters (String) TYPE
 COST Float
 Public Members: Function Read_Data() to read an object of HOUSING type.
 Function Display() to display the details of an object.
 Function Draw_Nos() to choose and display the details of 2 houses selected randomly from an array of 10 objects of type HOUSING.
 Use random function to generate the registration nos. to match with REG_NO from the array.
- Define a class Sports in C++ with the following descriptions: 4
 Private Members:
 Team name[25] for storing name of the team
 No_of_Participants for number of participants
 Standard for storing the participant class
 Position for recording the position
 Points for assigning the points based on position
 Assign_Points () to assign values based on the following condition

Position	Points
I	7
II	5
III	3

If number of participants is more than 7, then points for each position will be doubled.

Public Members:

- A constructor to assign appropriate values for the members.
- Get_Data () to read the values for Name of the game, number of participants and their class and position and also to invoke Assign_Points()

Show_Data() to show the values of all data members.

3) Define class CLOCK in C++ with the description given below: 4

Private members

Hours of type integer
Minutes of type integer

Public members :

ReadTime(int h, int m) to initialize data members

ShowTme() to display data members

AddTime(CLOCK T1, CLOCK T2) to add two objects of type CLOCK.

(If T1= 6 Hours 35 minutes and T2 = 7 Hours 45 minutes then Sum-Time = T1+T2= 2 Hours 20 minutes ie. 12 hour format)

4) Define a class CARRENTAL in C++ with the following description: 4

Private members:

CarId of type long int, AboutCar of type string, Cartype of type string, Rent of type float

A member function AssignRent() to assign the following values for Rent as per the given Cartype

Cartype	Rent
Small	1000
Van	800
SUV	2500

Public members

A function GETCar() to allow user to enter values for CarID, AboutCar, Cartype and call function AssingRent() to assign Rent.

A function ShowCar() to allow user to view the content of all the data members.

5) Define a class Play in C++ with the following specifications

Private members of class Play

Playcode integer

Playtitle 25 characters

Duration float

Noofscenes integer

Public members of class Play

A constructor function to initialise Duration as 45 and Noofscenes as 5.

Newplay() function to accept values for Playcode and Playtitle.
 Moreinfo() function to assign the values of Duration and Noofscenes with the help of corresponding values passed as parameters to this function.
 Showplay() function to display all the data members on the screen.

6) Define a class Tour in C++ with the description given below:

Private Members:

TCode of type string NoofAdults of type integer NoofKids of type integer
 Kilometres of type integer TotalFare of type float

A function AssignFare () which calculates and assigns the value of the data member TotalFare as follows
 For each Adult

Fare(Rs)	For Kilometres
500	>=1000
300	<1000 & >=500
200	<500

For each Kid the above Fare will be 30% of the Fare mentioned in the above table For example:

If Kilometres is 850, NoofAdults = 2 and NoofKids = 3

Then TotalFare should be calculated as

NumofAdults * 300 + NoofKids * 90

Public Members:

A constructor to assign initial values as follows:

TCode with the word "NULL" NoofAdults as 0 NoofKids as 0
 Kilometres as 0 TotalFare as 0

A function EnterTour() to input the values of the data members TCode, NoofAdults, NoofKids and kilometres and invoke the Assign Fare() function.

A function ShowTour() which displays the content of all the data members for a Tour.

7) Define a class Hotel in C++ with the following description: 4

private members:

Rno ----data member of integer type to store room no

Name ----data member of integer type to store name

Tariff ----data member of float type to store per day charges

NOD ----data member to store number of days of stay

CALC()—A function to calculate and return amount as NOD * Tariff and if the

Value of NOD*tariff is more than 10000 then return as 1.05*NOD*Tariff

Public members:

void Checkin() A function to enter the content Rno, Name, Tariff and NOD

void Checkout() A function to display Rno, Name, Tariff and NOD(amount to be displayed by calling function CALC());

8) Define a class named ADMISSION in C++ with the following descriptions:

Private Members: AD_NO integer(Ranges 10 2000)

NAME Array of characters(String)

CLASS Character

FEES Float Public Members:

Function Read_Data() to read an object of ADMISSION type.

Function Display() to display the details of an object.

Function Draw-Nos.() to choose 2 students randomly

9) Declare a class to represent bank account of 10 customers with the following data members.

Name of the depositor, account number,

type of account (S for Savings and C for Current), Balance amount.

The class also contains member functions to do the following:

(i) To initialize data members.

(ii) To deposit money (iii) To withdraw money after checking the balance (minimum balance is Rs.1000) (iv) To display the data members. [Note: You are also required to give detailed function definitions]

10) Define a class Teacher with the following class specification:

Private members: Name 20 characters

Subject 10 characters

Basic, DA, HRA float Salary float

Calculate() function computes the salary and returns it.

Salary is sum of Basic, DA and HRA

Public members:

ReadData(): Function accepts the data values and invoke the calculate function.

DisplayData(): Function prints the data on the screen.

Write the output of the following programs:-

1)

<pre>class Flight { char height; int score; public: Flight() { height='H';score=0; } void Fly(int f) { height- =f; } void Land(int f) { height+=f; score++; } void show() { cout<<height<<'#'<<score<<endl; };</pre>	<pre>void main() { Flight L; L.Fly(4); L.show(); L.Land(5); L.show(); L.Fly(3); L.show(); }</pre>
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2) Find out the output of the following programs:

<pre># include <iostream.h> class Vehicle { int vno, rno, travellercount; public: Vehicle(int mtno=5) { vno=mtno; rno=0; travellercount=0;} void Round(int PL=40) { rno++; travellercount+=PL;} void showposition() {cout<<vno<<':'<<rno<<':'<<travellercount<<endl;}}; Contd....,</pre>	<pre>void main() { Vehicle v(100), h; v.Round(); v.showposition(); h.Round(50); v.Round(30); h.showposition(); v.showposition(); }</pre>
<p>3) Observe the following program and find out the output if the value of Num entered by the user is 4, choose the correct possible output(s) from the options from (i) to (iv), and justify your option. Find out the minimum and maximum value that can be assigned to Rndnum.</p> <pre>#include<stdlib.h> #include<iostream.h> void main() { randomize();</pre> <p style="text-align: right;">Contd..,</p>	<pre>int Num,Rndnum; cin>>Num; Rndnum = random(Num) + 5; for(int N = 1;N<=Rndnum;N++) cout<<N; } Output Options: (i) 0 1 2 3 4 5 6 7 8 (ii) 1 2 3 4 5 6 (iii) 1 2 3 4 5 6 7 8 9 (iv) 1 2 3 4 5 6 7</pre>


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4)#include<iostream.h>
   struct MyBox
   {
       int Length,Breadth,Height;
   };
   void Dimension(MyBox M)
   {
       cout<<M.Length<<x<<M.Breadth<<x;
       cout<<M.Height<<endl;
   }
   void main( )
   {
       MyBox B1={10,15,5},B2,B3;
       ++B1.Height;    Dimension(B1);
       B3=B1;
       ++B3.Length;
       B3.Breadth++;
       Dimension(B3);
       B2=B3;
       B2.Height+=5;
       B2.Length--;
       Dimension(B2);    }

```

<pre> 5)#include<iostream.h> class Ground { public: Ground() { cout<<"Ground floor constructed:"<<"\n"; } ~Ground() { cout<<"Ground floor demolished:"<<endl; } }; class Floor1 { public: Ground g; Floor1() {cout<<" floor1 constructed:"<<endl; } ~Floor1() {cout<<" floor1 demolished:"<<endl; } }; </pre> <p style="text-align: right;">Contd..,</p>	<pre> class Floor2 { public: Floor2() {cout<<" floor2 constructed:"<<endl; } ~Floor2() { cout<<" floor2 demolished:"<<endl; } }; class Floor3 { public: Floor3() { Ground g; Floor1 one; Floor2 two; cout<<" floor3 constructed:"<<endl; } ~Floor3() { cout<<" floor3 demolished:"<<endl; } }; </pre> <p style="text-align: right;">Contd.,</p>	<pre> void main() { Floor3 three; cout<<"This is all about construction and destruction:"<<endl; } </pre>
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III) 1. Answer the questions after going through the following class.

- i) In object oriented programming, what is Function1 and Function 2 referred as and when do they get invoked?
- ii) Write 2statements (2 ways of calling) so that Function 3 gets executed?
- iii) Complete the definition of Function 4

<pre> class Testme { int rollno; public: ~Testme() //Function 1 { cout<<rollno<<"Leaving exam hall"<<endl; } Testme() //Function 2 { rollno=1; cout<<rollno<<"enter exam hall"<<endl; } </pre>	<pre> Testme(int n) //Function 3 { rollno=n; cout<<rollno<<" is in exam hall"<<endl; } Testme(Testme & t); //Function 4 void mywork() //Function 5 { cout<<rollno<<"attempting "<<endl; } }; </pre>
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2) Answer the following questions (i) and (ii) after going through the following class.

class Exam

```

{
  int Year;
  public:
  Exam(int y)          //Constructor 1
  {
    Year=y;          }
  Exam(Exam &t);      //Constructor 2  };

```

(i) Create an object, such that it invokes Constructor
(ii) Write complete definition for constructor 2.

3)) Answer the question (i) and (ii) after going through the following class:

class Maths

```

{ char Chapter[20] int Marks; public: Maths() //Member Function 1
{ strcpy (Chapter, Geometry); Marks=10; cout <<Chapter Initialised ; }
-Maths() //Member Functions 2 { cout<<Chapter Over; }
};

```

(i) Name the specific features of class shown by member Function 1 and Member Function 2 in the above example.

ii) How would Member Function 1 and Member Function 2 get executed

4) Answer the following questions (i) and (ii) after going through the following class.

class Interview

```

{ int Month; public: interview(int y) {Month=y;} //constructor 1
interview(Interview&t); //constructor 2 };

```

(i) create an object, such that it invokes Constructor 1.

ii) write complete definition for Constructor 2.

5) a) Given the following C++ code, answer the questions (i) and (ii)

```

class TestMeOut
{ public:

```

```

~TestMeOut( )           //Function 1
{
    cout<<Leaving the examination hall<<endl;
}
    TestMeOut( )           //Function 2
        {
cout<<Appearing for examination<<endl;
}           void MyWork( )
{           cout<<Attempting Questions<<endl;
}   };

```

(i) In Object Oriented programming, what is Function 1 referred as and when does it get invoked/called?

ii) In Object Oriented Programming, what is Function 2 referred as and when does it get invoked/called?

Accountancy:

1. Solve the following questions in your notebook with proper format and working notes:
 - a. Additional questions i.e. from Q 73 to Q 101.
 - b. Questions based on incomplete information.

Business Studies:

- (1) Read ch.one thoroughly.
- (2) learn the notes and all the answers given at the end of ch.1 .
- (3) solve HOTS,value based and application based questions in the note book (write only the answers).

Economics:

1. Which of the following is "not" illustrated by a production possibility boundary?
 - A. scarcity
 - B. opportunity cost
 - C. necessity for choice
 - D. allocative efficiency
 - E. all of the above are illustrated

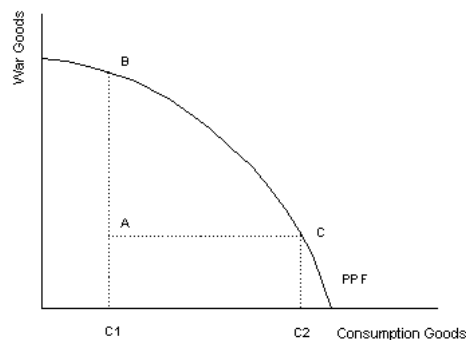
Use the table below to answer question number 2

"Guns"	0	100	200	300	400	500
"Bread"	1000	900	750	550	300	0

2. Consider the above production possibilities table. The table shows the maximum combinations of bread and guns that can be produced when all resources are fully employed. We can conclude that:
 - A. the opportunity cost of producing 200 guns instead of 100 guns is 750 units of bread.
 - B. the opportunity cost of producing 500 guns instead of 300 guns is zero since we don't have to give up any bread.
 - C. the opportunity cost of producing 400 guns instead of 100 guns is 600 units of bread.
 - D. the opportunity cost of producing 300 units of bread instead of 750 units of bread is 400 guns.
 - E. none of the above.

3. Which of the following changes will have no effect on the production possibility boundary?
 - A. the development of a new and superior fertilizer.
 - B. an increase in unemployment.
 - C. the development of a more productive method of steel production.
 - D. growth in the labor force.
 - E. all of the above affect the production possibility boundary.
4. All of the following would tend to increase a nation's production possibilities EXCEPT:
 - A. the society becomes more accepting of women who work.
 - B. a new hybrid for wheat is discovered.
 - C. a government program is instituted that encourages college education.
 - D. the nation decides (by whatever method) to increase production of investment goods and decrease production of consumption goods.
 - E. all of the above would tend to expand a nation's production possibilities.

Use the graph below to answer question number 5



5. At the beginning of world war II, the U.S. moved from the interior of their production possibility frontier to the boundary. In the graph above, this is represented by a move from point A to point B. What is the opportunity cost to the U.S. of making that decision?
 - A. since no consumption goods are sacrificed by moving from point A to B, the opportunity cost is zero.
 - B. while the opportunity cost is positive, it is impossible to show it exactly on the graph.
 - C. since the U.S. could have moved to point C rather than point B, the opportunity cost of moving to point B is the loss in potential consumption equal to the horizontal distance C1 - C2.
 - D. while it does not include the loss of any consumption goods, the opportunity cost does include the loss of American lives and property that occurred during the war.
 - E. none of the above.
6. Define the term economising of resources.
7. State which of the following statements are true/false, citing suitable reasons in support of your answer
 - a. FDI inflow has no direct impact on the PPC of the host country.
 - b. Two PPC can intersect each other
 - c. Education for all will have no direct impact on India's PPC
 - d. Only scarce good attracts price.
8. Generally it is observed that in factories labourers are paid overtime wages at a much higher rate than the normal wage rate. Discuss the economic rationale behind the same.
9. What is Marginal Rate Of Transformation? Explain with the help of an example
10. What is likely to be the impact of Make in India appeal to the foreign investors by the Prime Minister of India, on the PPC of India?