



ROLL NO.	
NAME	
CLASS & SECTION	

APEEJAY COMMON PRE-BOARD EXAMINATION, 2019-20

11

CLASS-XII

COMPUTER SCIENCE OLD (283)

Time allowed : 3 hrs.

Maximum Marks : 70

General Instructions :

- (i) All questions are compulsory.
- (ii) Programming Language: C++
- (iii) This question paper consists of 7 questions.

1. (a) Encapsulation is one of the major properties of OOP. How is it implemented in C++? (2)
- (b) Name the header file to be included for the use of the following built in functions: (2)
- (i) frexp()
 - (ii) toupper()
 - (iii) setw()
 - (iv) random()
- (c) Rewrite the following program after removing the syntactical error(s), if any. Underline each correction (2)
- ```
#include<iostream.h>
const int Dividor 5;
void main()
{ Number=15;
for (int Count=1; Count<=5;Count++, Number- =3)
if (Number%Dividor==0)
cout<<Number//Dividor ;
cout<<endl;
else
cout<<Number+Dividor<<endl;
}
```
- (d) Find the output of the following program : (2)

P.T.O.

Maths (Maths & A1) //Member Function 2

```
{

}
};
```

(i) Complete the definitions of Member Function 1 and Member Function 2 in the above example.

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

(c) Define a class Taxpayer, whose class description is given below : (3)

**Private Members :**

int pan - to store the personal account no.

char name[20] - to store the name

float taxableinc - to store the total annual taxable income.

float tax - to store the tax that is calculated.

computetax ( ) - A function to compute tax from the following rule:-

| Total Annual Taxable Income | Rate of Taxation |
|-----------------------------|------------------|
|-----------------------------|------------------|

|             |    |
|-------------|----|
| Up to 60000 | 0% |
|-------------|----|

|                                        |    |
|----------------------------------------|----|
| Greater than 60000, less than = 150000 | 5% |
|----------------------------------------|----|

|                           |     |
|---------------------------|-----|
| Above 150000, upto 500000 | 10% |
|---------------------------|-----|

|              |     |
|--------------|-----|
| Above 500000 | 15% |
|--------------|-----|

**Public Members :-**

inputdata ( ) - A function to enter the data and call the computetax( ) function.

display( ) - To display the data.

(d) Answer the questions (i) to (iv) based on the following : (4)

```
class cloth
```

```
{char category [5];
```

```
char description [25];
```

```
protected :
```

```
float price;
```

```
public :
```

```
void entercloth ();
```

```
void displaycloth ();
```

```
};
```

```
class design : protected cloth
```

```
{
```

```

char desgn [21];
protected :
float cost;
public:
int des;
design () { }
void enterdesign ();
void dispdesign ();
};
class costing : public cloth
{ float desingfee;
float stiching;
float cal_cp ();
protected:
float costprice;
float sellprice;
public:
void entercost ();
void dispcost ();
costing ();
};

```

- (i) Write the names of data members which are accessible from objects belonging to class cloth.
  - (ii) Write the names of all members function which are accessible from objects belonging to class costing.
  - (iii) Write the names of all the data members which are accessible from member functions of class costing.
  - (iv) How many bytes will be required by an object belonging to class costing?
3. (a) Write a function TRANSFER (int A[ ], int B[ ], int Size) in C++ to create the elements of array B[ ] with the help of corresponding elements of array A[ ] i.e. If A[N] is positive number then B[N] should be 1, and if A[N] is negative number B[N] should be -1, and if A[N] is zero B[N] should also be 0. (2)
- For example: If the content of array A is  
-98, 56, 0, -23, -34, 54

The content of array B should become

-1, 1, 0, -1, -1, 1

(b) Write a function `int skipsum(int a[ ][ ],int n,int m)` in C++ to find and return sum of the elements from all alternate elements of a two dimensional array starting from `a[0][0]`. (3)

(c) An array `P[20][30]` is stored in the memory along the column with each of the element occupying 4 bytes, find out the base address & memory location for the element `P[5][15]`, if an element `P[2][20]` is stored at the memory location 5000. (3)

(d) Evaluate the following postfix notation of expression showing the stack contents for each step of evaluation : (2)

True, False, AND, True, True, NOT, OR, AND

(e) Convert the following infix expression to its equivalent postfix expression showing stack contents for the conversion : (1)

$(X - Y) / ((Z + U) * V)$

(d) Each node of a stack contains following information, in addition to required pointer field. (3)

(i) Roll number of the student      (ii) Age of the student

Give the structure of node for the linked stack. Declare a class **STACK**, which has the **Data Members**: Top and Rear pointers of node type. **Member Functions** to perform the following :

(a) `Push()` – To push a node in to the stack, allocated dynamically.

(b) `Pop()` – To remove a node from the stack and release the memory.

4. (a) Assuming that a text file names `TEXT1.TXT` already contains some text written into it, write a function names `vowelwords()`, that reads the file `TEXT1.TXT` and creates a new file named `TEXT2.TXT`, which shall contain only those words from the file `TEXT1.TXT` which don't start with an uppercase vowel (i.e. 'A', 'E', 'I', 'O', 'U'). (2)

for example, if the file `TEXT1.TXT` contains

Carry Umbrella And Overcoat When it Rains

Then the file `TEXT2.TXT` shall contain

Carry When it Rains

(b) Explain the difference between `ios::ate` and `ios::app` modes. (1)

(c) Write a function in C++ to search for a laptop from a binary file "`LAPTOP.DAT`" containing the objects of class `LAPTOP` (as defined below). The program will display the records having `RAM >2GB`. (3)

class `LAPTOP`

```

{ long ModelNo; float RAM, HDD; char Details[120];
public:
void StockEnter () { cin>>Model No>>RAM>>HDD; gets(Details); }
void StockDisplay(){ cout<<ModelNo<<RAM<<HDD<<Details<<endl; }
float myLapTopRAM()
{
return RAM
}
};

```

5. (a) Explain primary key and foreign key. (2)
- (b) Consider the following tables employee and desig. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii) (6)

**employee**

| W ID | FIRSTNAME | LASTNAME | CITY       |
|------|-----------|----------|------------|
| 102  | SAM       | TONES    | PARIS      |
| 105  | SARAH     | ACKERMAN | NEW YORK   |
| 144  | MANILA    | SENGUPTA | NEW DELHI  |
| 210  | GEORGE    | SMITH    | HOWARD     |
| 255  | MARY      | JONES    | HUSTON     |
| 300  | ROBERT    | SAMUEL   | WASHINGTON |
| 335  | HENRY     | WILLIAMS | BOSTON     |
| 400  | RONNY     | LEE      | NEW YORK   |
| 451  | PAT       | THOMPSON | PARIS      |

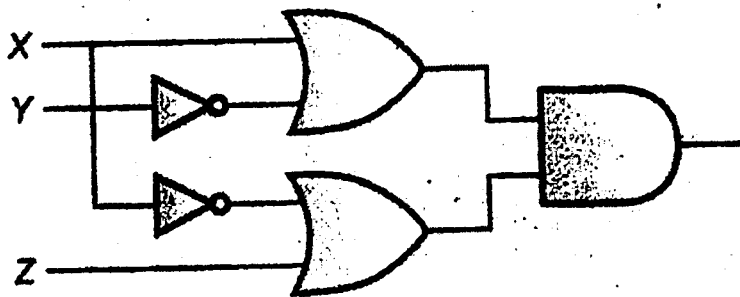
**desig**

| W ID | SALARY | BENEFITS | DESIGNATION |
|------|--------|----------|-------------|
| 102  | 75000  | 15000    | MANAGER     |
| 105  | 85000  | 25000    | DIRECTOR    |
| 144  | 70000  | 15000    | MANAGER     |
| 210  | 75000  | 12500    | MANAGER     |
| 255  | 50000  | 12000    | CLERK       |
| 300  | 45000  | 10000    | CLERK       |
| 335  | 40000  | 10000    | CLERK       |
| 400  | 32000  | 7500     | SALESMAN    |
| 451  | 28000  | 7500     | SALESMAN    |

- (i) Display FirstName and City of Employee having salary between 50,000 and 90,000.
- (ii) Display details of Employees who are from "PARIS" city.

- (iii) Increase the benefits of employee by 500 whose W-ID = 210.
- (iv) Count number of employees whose name starts from character 'S'.
- (v) Select MAX(salary) from design;
- (vi) Select FirstName from employee, design  
where designation = 'MANAGER' AND employee.W\_ID = design.W\_ID;
- (vii) Select COUNT (DISTINCT designation) from design;
- (viii) Select designation, SUM(salary) from design  
group by designation  
having count (\*) > 2;

6. (a) State and verify Absorption Laws using truth table. (2)
- (b) Write the equivalent Boolean Expression for the following logic circuit. (2)



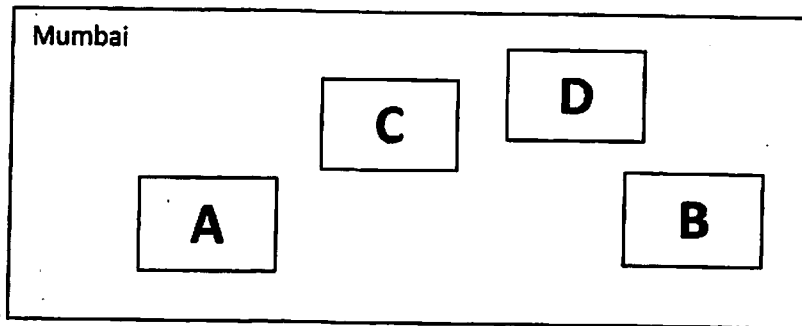
- (c) Write the POS form of a Boolean function F, which is represented in a truth table as follows : (1)

| P | Q | R | G |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 1 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 0 |
| 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 |

- (d) Reduce the following Boolean Expression using K-Map : (3)
- $F(A,B,C,D) = \Sigma (0,1,2,4,5,6,8,10)$

7. (a) Define the term hacking? How a Hacker is different from Cracker. (2)
- (b) Explain difference between star and bus topology. (2)

- (c) How firewall protect our networking. (1)
- (d) Explain Telnet. (1)
- (e) Oxford University has set up its new center at Mumbai for its office and web based activities.



The company compound has 4 buildings as shown in the diagram below : (4)

distance between buildings is as follows and No. of computers per building is as follows :

|         |      |
|---------|------|
| A and B | 50m  |
| B and C | 70m  |
| C and D | 25m  |
| A and D | 170m |
| B and D | 152m |
| A and C | 90m  |

|   |              |
|---|--------------|
| A | 12 computers |
| B | 20 computers |
| C | 24 computers |
| D | 10 computers |

- (i) Suggest a cable layout of connections between the buildings.
- (ii) Suggest the most suitable place (i.e., building) to house the server of this organization with a suitable reason.
- (iii) Suggest the placement of the following devices with justification :
- REPEATER
  - HUB/SWITCH
- (iv) The Institute is planning to link its another branch in Delhi. Suggest a way to connect it with reasonably high speed, cost is not the factor. Justify your answer.

**BEST OF LUCK!**