



DELHI PUBLIC SCHOOL, RANCHI
Pre Board-II Examination 2018
Computer Science (083)

Time: 3 Hours

Class: XII

Maximum Marks: 70

General Instructions:

- There are 08 Number of Questions, all in total.
- All Questions are mandatory unless alternative is provided.
- Use C++ programming Language where ever asked for.
- In answering DBMS, You should use MySQL Queries.
- Always keep margin at the left side of your answer script & clearly write the Question Number.
- Try to maintain the order of the questions during technically informative answering.
- Keep space and mark 'line-of-separation' between two answers.

Q.1.(a) In the time of **DIGITIZATION** in government policies, People talk about benefits of **e-governance**. But, these days, young generations are suffering from **INFOMANIA** as well. You, being an IT Student, mention your Role & Contribution for the Society in utilizing these two phenomenons properly. [2]

(b) During the controversy of film “ **Padmavati** ”, Dipika managed Leisure time & has started learning C++, but confused in finding Legal Identifiers out of the following : Suggest her in selecting correct identifiers for successful execution of her program.

New, friend, NoOfFilms, this, Num1, 3rdFloor, Float, class, this, enum, continue ; [2]

(c) Observe the following program very carefully and write the names of those header files, which are essentially needed to compile and execute the following program successfully: [2]

```
void main()
{ char ch, STR[20]; clrscr();
cin>>STR;
ch = toupper (STR[0]);
cout << setw(8)<< “ Bravo ! ”;
cout << “ STR << “ Lets begin wid ” << ch;
}
getch(); }
```

(d) Observe the following C++ code very carefully and rewrite it after removing any/all syntactical errors: [2]

```
Include < iostream.h>
void main( )
{ int R; W =90; while W>60 ;
{ R =W-50; Switch (W)
case 2: cout << “ Low Level ”<<endl;
case 3: cout << “ Middle ” <<endl ;
case 2: cout << “ High ” <<endl ; } }
```

(e) Predict output of the following C++ code: (Assume all required header file) [2]

```
class Calc
{ char Grade; int Bonus;
public: Calc() { Grade = ‘E’; Bonus = 0 ; }
void Down( int G)
{ Grade - = G; } void Up (int G)
{ Level + = G ; Bonus + + ; }
void Show( )
{ cout<<Grade << “%”<<Bonus<<endl ; } ;
void main( )
{ Calc C;
C.Down(2); C.Show(); C.Up(7);
C.Show(); C.Down(2); C.Show(); }
```

(f) Predict output of the following C++ code: (Assume all required header file) [2]

```
int main( )
{ int fun(int, int * );
int a[5] = {2,4,6,8,10};
int i, b = 5;
for ( i=0; i<5 ; i++)
{ fun (a[ i ], &b );
cout <<a[ i ] <<“ \t ”<< b << “ \n ”;
} return 0 ; }
void fun ( int p , int *q )
{
P = * (q) += 2 ;
}
```

<p>(g) Write the output of the following program code (Include all required header files): [2]</p> <pre> void main () { int A[] = {10, 12, 15, 17, 20, 30 }; for (int i=0; i < 6 ; i++) { if (A[i]%2 == 0) A[i] /=2 ; else if (A[i] %3 == 0) A[i] /= 3; if (A[i]%5 == 0) A[i] /= 5 ; } for (i = 0 ; i < 6 ; i++) cout << A[i] << “ # ” ; }</pre>	<p>(h) Find the expected value of MyAnk from the options: (Add all required header files for successful compilation and then Justify your Answer). [2]</p> <pre> void main() { randomize(); int Ank[] = { 25, 20, 34, 56, 72, 63}, MyAnk ; MyAnk = Ank[2 + random(2)]; cout << MyAnk << endl; } Options: (i) 25 (ii) 34 (iii) 29 (iv) None of these</pre>
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- Q.2. (a)** Mention any Two Situations, when a **Copy Ctor** is automatically invoked. [1]
- (b)** Write a program defining a class StudRes to simulate Result preparation System for 5 students. The data available for each student includes RollNo, SName and Marks in 3 subjects. Keep the data members in private mode and three member functions: **GetVal ()**, **CompteRes ()** and **ResultPrnt ()** in public access mode. Use of **SRO** will be appreciable. The percentage marks and grade are to be computed from this information. The Percentage Marks are the Average Marks and the Grade is calculated as given below: [3]

<u>Percentage Marks:</u>	<u>Grade:</u>
< 40	‘F’
>=40 < 85	‘B’
>=85 < = 100	‘A’

- (c)** Answer the questions (i) to (iv) based on the following code: [4]
- ```

class Dolls { char DCode[5]; protected : float Price; void CalcPrice (float);
public: Dolls() ; void DInput () ; void DShow() ; }
class SoftDolls : public Dolls
{ char SDName[20] ; float Weight ;
public : SoftDolls () ; void SDInput() ; void SDSHow() ; }
class ElectronicDolls : public Dolls
{char EDName[20] ; char BatteryType[10] ; int Batteries;
public: Electronic Dolls() ; void EDInput() ; void EDSHow() ; }

```
- (i) How many bytes will be required by an object of the class ElectronicDolls ?
- (ii) Which type of Inheritance is shown in the above example?
- (iii) Name all the member functions accessible by an object of the class ElectronicDolls.
- (iv) Name all the data members accessible from member functions of class ShoftDolls.

- Q.3 (a)** Write the definition of a function: **SwpChng ( int A[ ], int Size )**, which accepts an integer array and its size as arguments and swap the elements of every Even location with its following Odd Locations:
- Example: If an array of nine integers are as: **2, 4, 1, 6, 5, 7, 9, 23, 10;**  
Then the function should rearrange the array as: **4, 2, 6, 1, 7, 5, 23, 9, 10;** [2]

(b) An array **AR[1..15][1..10]** is stored in the memory with each of the element occupying 4 bytes of space. Assuming the base address of array VAL is 1500, Calculate the memory location for the element VAL[12][9], when the array is stored as  
 (i) **Column** wise and (ii) **Row** wise. [3]

(c) For a Circular Queue (CQ) with 5 memory location, Show diagrammatically the status of CQ with **Front & Rear** , after each of these operations: **A, B and C Inserted ; A deleted ; D & E Inserted ; B & C deleted ; F Inserted and D deleted ; G, H Inserted ; E, F deleted ; K Inserted ; G, H deleted and K Deleted.** [2]

(d) Evaluate the following Postfix expression showing the stack contents. [2]  
**true, false, true, false, NOT, OR, true, OR, OR, AND ;** ( Check Manually as well ).

(e) Write the definition of a function to perform PUSH ( ) operation in a dynamically allocated STACK considering the following: **struct COPY { int X, Y; COPY \*link; } ;** [3]  
**class STACK { COPY \*Top; public : STACK ( ) { Top = NILL ; }**  
**void PUSH ( ) ; void POP ( ) ; ~STACK ; } ;**

(f) State Pre conditions under which **Binary Search Technique** is applicable. [1]

**Q.4 (a)** Name two member functions of **ofstream** class. [1]

(b) How are **Text Files** different from **Binary Files in C++**. Provide **examples** also. [2]

(c) Write a function definition for **CHAR4 ( )** function to read the content of text file **Test.TXT**, and display all those words, which has four characters in it. [2]

**If the contents of the File is : “ When She was a child, she used to play in the garden. Those days were golden.”** The function should display : **When used play days were**

**Q.5. (a)** Explain **Cartesian Product** of two Relations. Give example too. Write symbol of **JOIN**. [2]

(b) What is the difference between **Cardinality** and **Degree**? Show by example also. [2]

**Q.6.** Consider the following tables **GAME** and **PERSON** and answer (b) and (c): [6]

**GAME**

| GCode | GameName    | Number | FEE   | S_Date      |
|-------|-------------|--------|-------|-------------|
| 11    | CaromBoard  | 2      | 6000  | 23-jan-2014 |
| 12    | Badminton   | 2      | 13000 | 12-dec-2013 |
| 13    | TableTennis | 4      | 9000  | 14-feb-2014 |
| 14    | Chess       | 2      | 10000 | 01-jan-2014 |
| 15    | LawnTennis  | 4      | 26000 | 19-mar-2014 |
|       |             |        |       |             |

**PERSON**

| PCode | Name    | GCode |
|-------|---------|-------|
| 1     | Aamir   | 11    |
| 2     | Sindhu  | 15    |
| 3     | Jignesh | 11    |
| 4     | Nihir   | 13    |
| 5     | Salman  | 14    |

(b) Write SQL commands for the following:

- (i) To display the name of all Games with their Fees & Gcodes.
- (ii) To display details of those game which are having Fee less than 10001.
- (iii) To display the content of the GAME table in descending order of Fees.
- (iv) To display Name, GameName of the person whose GCode is 15.

(c) Give the output of the given queries:

- (i) **SELECT COUNT(DISTINCT Number) FROM GAME;**
- (ii) **SELECT MAX(S\_Date), MIN(S\_Date) FROM GAME;**
- (iii) **SELECT AVG(Fee), MAX(Fee) FROM GAME;**
- (iv) **SELECT DISTINCT GCode FROM PERSON;**

**Q.7.** (a) State and verify **DeMorgan's Law** by algebra. Also check by Truth Table. [2]

(b) Which Gates are called Universal gates and why? Represent :

$(X'+Y'+Z') \cdot (X+Y'+Z') \cdot (X+Y+Z')$  in **NOR – to – NOR Logic Network**. [2]

(c) Derive Canonical **POS & SOP** Expressions for Boolean function F, represented by truth table: [1]

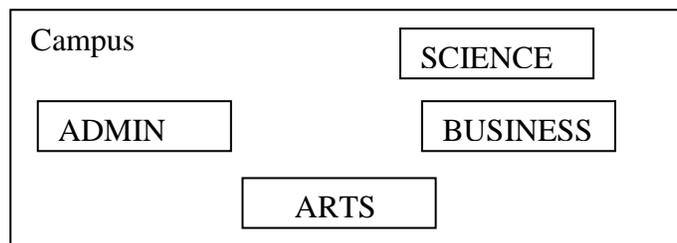
| A | B | C | F(A,B,C) |
|---|---|---|----------|
| 0 | 0 | 0 | 0        |
| 0 | 0 | 1 | 1        |
| 0 | 1 | 0 | 1        |
| 0 | 1 | 1 | 0        |
| 1 | 0 | 0 | 1        |
| 1 | 0 | 1 | 0        |
| 1 | 1 | 0 | 1        |
| 1 | 1 | 1 | 0        |

(d) Suppose Jharkhand Government has planned to connect Ranchi – Tata through Railway. According to their proposal, there are Four parallel Railway tracks at a place. It is desired to design a Logic circuit, which can give a signal when TWO or more trains pass together at any given time. Draw the Truth Table for this Assignment. Then Draw a Logic Circuit after simplifying Boolean expression using Maurice Karnaugh - Map. [3]

**Q.8.** (a) An educational organization DPS Ranchi, is planning to set up its another campus at Dumka, with its Head office at Ranchi. The Dumka campus has 4 main buildings – ADMIN, SCIENCE, BUSINESS and ARTS. You, as a network expert have to suggest the best network related solutions for their problems raised in (i) to (iv), keeping in mind the distances between the buildings and other given parameters. [4]

RANCHI

DUMKA



**Shortest distances between various buildings:**

**No. of Computers installed at various buildings**

|                                    |        |
|------------------------------------|--------|
| ADMIN to SCIENCE                   | 65 m   |
| ADMIN to BUSINESS                  | 100 m  |
| ADMIN to ARTS                      | 60 m   |
| SCIENCE to BUSINESS                | 75 m   |
| SCIENCE to ARTS                    | 60 m   |
| BUSINESS to ARTS                   | 50 m   |
| RANCHI Head Office to DUMKA Campus | 290 Km |

|                    |     |
|--------------------|-----|
| ADMIN              | 105 |
| SCIENCE            | 85  |
| BUSINESS           | 40  |
| ARTS               | 14  |
| RANCHI Head Office | 22  |

(i) Suggest the most appropriate location of the server inside the DUMKA Campus (out of the 4 buildings), to get the best connectivity for maximum number of computers. Justify your answer

(ii) Suggest and draw the cable layout to efficiently connect various buildings within the DUMKA campus for connecting the computers.

(iii) Which hardware device will you suggest to be procured by company to be installed to protect and control the internet uses within the campus?

(iv) Which of the following will you suggest to establish the online face-to-face communication between the people in the Admin Office of DUMKA campus and RANCHI Head Office?

- (a) Text Chat    (b) E-Mail                      (c) Cable TV                      (iv) Video Conferencing

(b) Out of followings, which is the fastest (i) Wired and (ii) Wireless medium of Communication:

**Infrared, Coaxial Cable, Ethernet Cable, Microwave, Optical Fiber?** [1]

(c) Discuss the terms: **GNU and W3C**. [1]

(d) What is meant by **Bandwidth? What is its Role in a Network?** . [2]

(e) What is the popular **80 – 20 Rule of Network Design? Explain**. [2]

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