

**CENTRE FOR DISTANCE AND ONLINE EDUCATION,  
AMU, ALIGARH**

**Post Graduate Diploma in Computer Programming  
(PG-DCP)**

**Session: January- 2021**

**PROJECT REPORT**

**Note:-**

- Project has to be submitted at Centre for Distance and Online Education (main building), AMU, Aligarh. Project also can be submitted Online on [cdeonlineassignments@gmail.com](mailto:cdeonlineassignments@gmail.com)
- The last date for submission of Project 15 January 2022.

**SECTION – A**  
**(COMPUTER PROGRAMMING USING ‘C’)**

**Question Based on C**

Q. 1 Write algorithm for the following:

- a) To check whether an entered number is odd / even.
- b) To calculate sum of three numbers.

Q. 2 Draw a flowchart for the following :

- a) to find greater and smaller number from given two numbers.
- b) to calculate sum of first 10 odd numbers.

Q. 3 Write short notes on the following :

- a) C Variables
- b) C data types

Q. 4 Accept principal amount, rate of interest, and duration from the user. Display Interest Amount and Total Amount (Principal + Interest).

Q. 5 Accept the salary of an employee from the user. Calculate the gross salary on the following basis:

<b>BASIC</b>	<b>HRA</b>	<b>DA</b>
1 - 4000	10%	50%
4001 - 8000	20%	60%
8001 - 12000	25%	70%
12000 and above	30%	80%

Q. 6 Accept any number from the user. Display whether the number is divisible by 100 or not.

Q. 7 Accept a month in digit from the user. Display the month in words. If number is not between 1 and 12 display message “Invalid Month”. (Use ‘switch’)

Q. 8 Display all prime numbers between 50 and 150. Q. 9 Write a program to print the following pattern:

a)

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

b)

```
1
2 6
3 7 10
4 8 11 13
5 9 12 14 15
```

Q. 10 Write a program to swap the values of two numbers through pointers. Do this using call by reference method of function.

### **Question based on DBMS**

1Q: Define entity, entity relationship and schema. Draw an ER diagram for entity **Employee** and **Animal**.

2Q: Explain key, types of key and relational database with suitable examples.

3Q: Define functional dependencies.

4Q: What is hashing, how hashing is beneficial for searching an element in a large space.

5Q: Explain normalization and types of different normal forms.

## SECTION – B

### (COMPUTER FUNDAMENTALS & PC SOFTWARE)

1. Create a document with the text given below and save it as First.Doc

ROM, is a form of data storage in computers and other electronic devices that cannot be easily altered or reprogrammed. RAM is referred to as volatile memory and is lost when the power is turned off whereas ROM is non-volatile and the contents are retained even after the power is switched off. RAM, is a form of data storage that can be accessed randomly at any time, in any order and from any physical location in contrast to other storage devices, such as hard drives, where the physical location of the data determines the time taken to retrieve it. RAM is measured in megabytes and the speed is measured in nanoseconds and RAM chips can read data faster than ROM.

#### **Do the following:**

- Count the occurrences of the word “ROM” and “RAM” in the above document.
- Replace ROM with Read Only Memory and RAM with Random Access Memory in the entire document
- Underline and bold the text Read Only Memory and Random Access Memory.
- Make an auto correct entry for RAM and it should be replaced by Random Access Memory

2. Perform the following tasks in Ms- Word.

- i) Open a document. Type the following text.

Microsoft Office, or simply Office, is a family of client software, server software, and services developed by Microsoft. It was first announced by Bill Gates on August 1, 1988, at COMDEX in Las Vegas. Initially a marketing term for an office suite (bundled set of productivity applications), the first version of Office contained Microsoft Word, Microsoft Excel, and Microsoft PowerPoint. Over the years, Office applications have grown substantially closer with shared features such as a common spell checker, OLE data integration and Visual Basic for Applications scripting language.

Office is produced in several versions targeted towards different end-users and computing environments. The original, and most widely used version, is the desktop version, available for PCs running the Windows and macOS operating systems. Office in a browser, previously known as Office Online, is a version of the software that runs within a web browser, while Microsoft also maintains Office apps for Android and iOS.

- ii) Insert the following text after the first paragraph.

The main components of a word processing system are listed below:

- Computer
  - Printer
  - A word Processing Software.
- iii) Save the document as MS office.doc
  - iv) Move the second paragraph to the end of the document, using drag & drop feature.
  - v) Restore the original status of the document.
  - vi) Now provide a header “I am working with Word Processor“ in 16 pt. bold, underline, Italics and in Times New Roman.
  - vii) Move the second paragraph in the end of the document using cut, paste operations.
  - viii) Undo the above actions.
  - ix) Now redo the above actions.
  - x) Go to the beginning of the document.
  - xi) Search the word “Microsoft” in your document with options Match case, Find whole words only.
  - xii) Replace the word “Microsoft” with “microSoft“.
  - xiii) Format the above written paragraphs and give the options as follows:
    - Alignment : justified
    - Indentation : Left 0.5” Right: 0.5”
    - Spacing: Before 10 pt. After: 6 pt.
    - Special : First Line by: 0.5”
    - Line spacing: 2.0 Lines.
  - xiv) Set the margins to 1.50”

### 3. Perform the following in MS-Word

- i) Create a new word document and type the following text:

#### **“A ROBOT IN THE HOUSE”**

Correction. You are in error. You are misinforming your father. Correction. The work has not been done. Your computer has not been used ERROR.

ERROR: The robot’s voice was metallic.

AHMAD: You are so lucky Aditya! Manu can do so many things. It can clean the house. It can answer the telephone, call the doctor and it can even open the door.

ADITI: Wait! There are so many things it can’t do. It can’t laugh. It can’t do

MY HOMEWORK FOR ME. It can’t even help me decide what should I wear for the party.

- ii) Save the document as DOCUMENT.DOC
- iii) Insert the following text before the conversation between Aditi and Ahmad “Oh! Stop interrupting, Manu”. Aditi said Mohan. “You’re are not supposed to participate in every conversation”
- iv) Make the story heading bold, italic, underline and 16 pts.

- v) Change the font style of entire story to MS-Comic Sans
- vi) Select the heading of the document, cut and paste it at the end of the document.
- vii) Insert page number.
- viii) Select the first two lines of the paragraph and convert it to uppercase and underline.
- ix) Change all the uppercase letters to lowercase and vice-versa.
- x) Change the font style of the last paragraph 9.5 pts bold italic.
- xi) Copy this format to the first paragraph using format painter.
- xii) Insert any figure on the document.
- xiii) Highlight the second paragraph. (Hint: use highlighter or formatting toolbar)
- xiv) Change the font size of the half text of entire text to 14 pts.
- xv) Make a copy of this document with a different name (MYBOOK.DOC)

**4. Perform the following tasks in Ms- Word.**

- i) Try to write the following text in the format as shown:

You come across several documents every day. Some examples of documents are listed below:

Documents that inform

- Letters
- Brochures
- Financial reports

Documents that persuade

- Advertisements
- Invitations
- Press Releases

Agendas for meetings

- Research proposal
- Magazines
- Newsletters

Documents that identify

- Business cards
- Certificates
- Labels

- ii) Insert following tables in your document

<b>Organic Compound</b>	<b>Molecular Formula</b>
Methane	CH <sub>4</sub>
Ethane	C <sub>2</sub> H <sub>6</sub>
Propane	C <sub>3</sub> H <sub>8</sub>

Butane	C <sub>4</sub> H <sub>10</sub>
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iii) Symbol Electronic Configuration

Organic Compound	Molecular Formula
H	1s <sup>1</sup>
He	1s <sup>2</sup>
Li	[He] 2s <sup>1</sup>
Be	[He] 2s <sup>2</sup>

Save and close the document.

5. Open a new document and insert a table with the following data:

First Name	Last Name	Phone	Address
Ahmad	Malik	5256787	Mukherjee Nagar, Aligarh
Preeti	Ahuja	1453456	BadarBagh, Aligarh
Malik	Khan	3289723	B-P/81,B.P.Colony, Aligarh
Mandeep	Kaur	4976381	25/K9,Outram Lines, Aligarh

- i) Save the document with Studentdetail.doc
- ii) Select the first and third Row and Bold the Text.
- iii) Align the text in the second and fourth row to “Center” and align the text in the remaining rows to “Left”.
- iv) Insert a New Column to the beginning of the table with the following data.
 

S.No
1
2
3
4
- v) Add a New Row second to the End of the Table.
- vi) Insert a New Row between 2 and 3.
- vii) Insert a New Column between 1th and 2th Column.
- viii) Change the size of the second column’s width.
- ix) Sort the data according to alphabetical order of “Last Name”.
- x) Delete the third row and third Column from the table.
- xi) Apply Borders, Shading and Color to the table.
- xii) Spell checks your document and correct all the grammatical as well as spelling mistakes
- xiii) Save the above document and Close your document.

6. Open a new document and type the following letter.

**From**

**February 15, 2020**

**XYZ**

Royal Apartments,

No: 120, II Avenue, T. Nagar

Aligarh, 202002.

To

**Dear Sir/Madam,**

With the current slowdown in hiring within the high- tech field, you must be flooded with resumes from out-placed software engineers such as me.

Please take a moment to consider my qualifications. I believe in particular is highly marketable in this tight market.I worked on the team that pioneered the technology that put the Palm Pilot on the map.

In today's increasingly mobile society, this technology has places to go, and I have ideas that could take us to the next step in office independence.

Please call me with prospective job opportunities. I am interested in a project management position in the Rs. 9K range.

**Thank you!**

XYZ.

**Enclosure: Resume.**

- i) Save the document as "Letter.doc."
- ii) Send the document to 10 recipients using Mail merge. (Use 10 different addresses)
- iii) Close the document.

7. Below is given a letter and some addresses, this letter is to be sent to all these addresses, so use mail merge option to do so. The Addresses are:



First Name	Last Name	Phone	Address
Shameem	Malik	554664987	d-30 SS Nagar aligarh
Preeti	Ahuja	145788356	h-30 BadarBagh, aligarh
Farhan	Khan	320637623	B-P/81,B.P.Colony, aligarh
Mandeep	Kaur	457974681	25/K9,Outram Lines , aligarh

**The Letter is:-**

To

<<Name>>

<<Address>>

Dear <<Name>>

You are called for an interview on the <<Date>>at 9:00 A.M with your original documents

Yours Sincerely

XYZ Limited

Phase -7, HauzKhas

New Delhi, 110016

8. Type the following data in excel worksheet and save it as first.xls

	A	B	C	D	E
1.	1513				
2.	2501				
3.	3504				
4.	4453				
5.	5511				
6.	6516				
7.	7532				
8.	8504				
9.	9432				
10.	10521				
11.	11517				

**Do the followings:**

- i. Highlight column A and copy it to column D.
- ii. Sort the data in column D in descending order.
- iii. What is the lowest and highest number in the list (use a function).
- iv. Copy the data in column A to column E and sort it in ascending order.
- v. How many numbers in this list are bigger than 5000 (use a database function).
- vi. How many numbers in column A are between 5501 and 10540 inclusive (use a database function).

9. Type the following data in excel worksheet and save it as second.xls.

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
1.	<b>People per physician</b>	<b>Life Expectancy</b>				
2.	X	Y	X*Y	X <sup>3</sup>	Y <sup>3</sup>	X <sup>2</sup> *Y <sup>2</sup>
3.	3701	7.5				
4.	616	3.5				
5.	686	1.5				
6.	447	4.5				
7.	647	6.0				
8.	1171	7.1				
9.	6605	0.5				
10.	4515	8.5				

**Do the followings:**

- i. Complete column C for finding product  $x * y$ .
- ii. Find sum of x column at the end of data.
- iii. Find sum of y column at the end of data.
- iv. Find sum of  $x * y$  column at the end of data.
- v. Find sum of  $x^3$ .
- vi. Find sum of  $y^3$ .

10. Enter the following data and save it in grade.xls

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
1.	<b>Name</b>	<b>Marks1</b>	<b>Marks2</b>	<b>Marks3</b>	<b>TOTAL</b>	<b>Percentage</b>	<b>Grade</b>
2.	Ahmad	55	66	67			
3.	Reno	34	56	78			
4.	Rajeev	59	68	66			
5.	Khan	53	89	55			
6.	Sandeep	78	74	75			
7.	Anita	55	66	67			

**Do the followings:**

- i. Compute the total marks and percentage of each student by entering appropriate formula.
- ii. Compute the grades based on following criteria:

If percentage  $\geq 90$  then grade = A+

If percentage  $\geq 80$  and  $< 90$  then grade = B+

If percentage  $\geq 70$  and  $< 80$  then grade = B

If percentage  $\geq 60$  and  $< 70$  then grade = C

If percentage  $\geq 50$  and  $< 60$  then grade = D

If percentage  $< 50$  then grade = D

- 11. A university maintains a year wise result for four courses and then generates an average report as given below:

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
1.	S.No.	Year	Course 1	Course 2	Course 3	Course 4	Average
2.	1.	2015	456	556	546	600	
3.	2.	2016	450	450	620	550	
4.	3.	2017	550	650	430	590	
5.	4.	2018	450	660	470	560	
6.	5.	2019	470	520	580	480	
7.	6.	<b>Total</b>					

i. Complete

te the report to calculate the course wise average in row 6

- ii. Provide formula to calculate year wise average in column G
- iii. Generate a column chart to compare data.

**SECTION – C**

**(OBJECT ORIENTED PROGRAMMING THROUGH C++)**

- 1. Define a class employee. Include the following members:

Data Members:

- i) Name of the employee
- ii) Employee's department
- iii) Age of the employee

Member Functions:

- i) To get the name, department and age of the employee
  - ii) To display the name department and age of the employee.
2. Define a class BankAccount to represent a bank account. Include the following members:

Data Members:

- i. Name of the depositor
- ii. Type of depositor
- iii. Account Number
- iv. Type of account
- v. Available Balance amount in the account

Member Functions:

- i. To assign initial value
  - ii. To deposit an amount
  - iii. To withdraw an amount after checking.
3. Define a class employee having data members as emp\_code, dept\_code, age, basic, DA, HRA and three member functions as getdata(), putdata(), calculatessalary() to get, display all the values of data members and calculate the total salary by adding basic, DA, HRA. Write this program for 10(ten) employees using an array of objects.
4. Write a program in C++ to demonstrate default constructor. Create a class having two data members in the private section. Define a default constructor to initialize these data members to initial value and display these values with the help of member function.
5. Create a class called Rectangle that stores the length and height of a Rectangle in two private instance variables. Include a constructor that sets these values. Define Three functions. The first is RecLeng( ), which returns the length of the rectangle. The second is area ( ), which returns the area of the rectangle and The Third is Rechei( ), which returns the height of the rectangle
6. Declare a class “Arithmeticopert” that contains two data member a and b of the type of integer, define constructor to give initial value, and perform addition, subtraction, multiplication and division of these two numbers using operating overloading of +,-,\*,/ operator respectively.

## SECTION – D

### (DATA STRUCTURE THROUGH ‘C’ LANGUAGE)

1. Write a program in ‘C’ language that accepts two matrices as input and prints their sum and product.
2. Write a program in ‘C’ Language to accept 5 strings and 5 float value as input and print them in lexicographic order.
3. Write a program in ‘C’ Language that accepts two strings S1 and S2 as input.
4. The program should check if S1 is a substring of S2 or not. If S1 is a substring of S2, then the program should output the starting location and ending location of S1 in S2. If S1 appears more than once in S2, then the locations of all instances have to be given. Merge the S2 and S1 and store the final string in S3.
5. Armstrong numbers are those numbers whose sum of cubes of each digit is equal to that number. For example:  $153 = 1^3 + 3^3 + 5^3$ . Write a program to find all Armstrong number in the range of 0 and 500.
6. Write a program to check the entered number is palindrome or not. Note that palindrome means a number and its reverse number is same. For example: 12321.
7. Write a program in ‘C’ language to add and multiply two sparse matrices.
8. Write a program in ‘C’ language for the creation of a list. Also, write a procedure for deletion of an element from the list. Use pointers.
9. Write a program in ‘C’ language to enter the string from keyboard and reverse an input string.
10. Write a program in ‘C’ language to implement linear search.
11. Write a program in ‘C’ language to implement merge sort.
12. Write a program in ‘C’ language to implement binary search.
13. Write a program in ‘C’ language to implement insertion sort.

  
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