

2017**M.Sc. 4th Semester Examination****APPLIED MATHEMATICS WITH OCEANOLOGY AND
COMPUTER PROGRAMMING****PAPER—MTM-402 (Unit-I)***Full Marks : 25**Time : 1 Hour**The figures in the margin indicate full marks.**Candidates are required to give their answers in their
own words as far as practicable.**Illustrate the answers wherever necessary.***(Data Structure and Design and
Analysis of Algorithm)**

1. Answer any two questions : 2×2
- (a) Write down any four applications of a queue.
- (b) Why array is a static data structure ?
- (c) What do you mean by complexity of an algorithm ?

(Turn Over)

2. Answer any four questions :

4×4

- (a) Define data structure "complex" which consists of necessary data members with some possible operations and assumptions.
- (b) Illustrate the steps for factorial value calculation of an integer using stack. Use it for the calculation of $4!$.
- (c) What is circular queue ? What is the advantage of circular queue over line queue. State the conditions for circular queue empty and full.
- (d) Show that the linked representation of the following two polynomials :

$$P(x) = 7x^{80} + 5x^{50} + 3x^{30} + 1$$

$$Q(x) = 9x^{90} + 6x^{60} + 2x^{20} - 1$$

Write the steps for subtracting two polynomials store in linked lists.

- (e) Explain how to implement two stacks in one array $A[1...n]$ in such a way that neither stack overflows unless the total number of elements in both stacks together is n . The PUSH and POP operations should run in $O(1)$ time.
- (f) Define a sparse matrix. Explain different types of sparse matrices. Calculate the index formula of any element of a triangular matrix store in memory.

[Internal Assesment : 05 Marks]

2017

M.Sc. 4th Semester Examination
APPLIED MATHEMATICS WITH OCEANOLOGY AND
COMPUTER PROGRAMMING

PAPER—MTM-402 (Unit-II)

Full Marks : 25

Time : 2 Hour

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

**(Data Structure and Design and
Analysis of Algorithm)**

(Questions to be selected by lottery)

Answer any one question :

1×20

1. (a) Create a database file that will maintain a list of Name, Addresses and Aadhar numbers. Write a program in FoxPro to obtain a popup menu containing the items.

(Turn Over)

- (i) Add a new record.
- (ii) Delete a record.
- (iii) Modify a record.
- (iv) Retrieve and display an entire record for a given Aadhar number.
- (v) Generate a complete list of all records.
- (vi) Exit from menu.

Enter 5 records and implement (i) and (vi).

2. Create a database file that will maintain a list of Name, Addresses and Aadhar numbers. Write a program in FoxPro to obtain a popup menu containing the following items

- (i) Add a new record.
- (ii) Delete a record.
- (iii) Modify a record.
- (iv) Retrieve and display an entire record for a given Aadhar number.
- (v) Generate a complete list of all records.
- (vi) Exit from menu.

Enter 5 records and implement (ii) and (vi)

3. Create a database file that will maintain a list of Name, Addresses and Aadhar numbers. Write a program in FoxPro to obtain a popup menu containing the following items :

- (i) Add a new record.
- (ii) Delete a record.
- (iii) Modify a record.
- (iv) Retrieve and display an entire record for a given Aadhar number.
- (v) Generate a complete list of all records.
- (vi) Exit from menu.

Enter 5 records and implement (iii) and (vi).

4. Create a database file that will maintain a list of Name, Addresses and Aadhar numbers. Write a program in FoxPro to obtain a popup menu containing the following items :

- (i) Add a new record.
- (ii) Delete a record.
- (iii) Modify a record.
- (iv) Retrieve and display and entire record for a given Aadhar number.
- (v) Generate a complete list of all records.
- (vi) Exit from menu.

Enter 5 records and implement (iv) and (vi).

5. Create a database file that will maintain a list of Name, Addresses and Aadhar numbers. Write a program in FoxPro to obtain a popup menu containing the following items :

- (i) Add a new record.

- (ii) Delete a record.
- (iii) Modify a record.
- (iv) Retrieve and display an entire record for a given Aadhar number.
- (v) Generate a complete list of all records.
- (vi) Exit from menu.

Enter 5 records and implement (v) and (vi).

6. Create a database file that will maintain a list of Name, Addresses and Aadhar numbers. Write a program in FoxPro to obtain a popup menu containing the items :

- (i) Add a new record.
- (ii) Delete a record.
- (iii) Modify a record.
- (iv) Retrieve and display an entire record for a given Aadhar number.
- (v) Generate a complete list of all records.
- (vi) Exit from menu.

Enter 5 records and implement (i), (v) and (vi).

7. Create a database file that will maintain a list of Name, Addresses and Aadhar numbers. Write a program in FoxPro to obtain a popup menu containing the items :

- (i) Add a new record.

- (ii) Delete a record.
- (iii) Modify a record.
- (iv) Retrieve and display an entire record for a given Aadhar number.
- (v) Generate a complete list of all records.
- (vi) Exit from menu.

Enter 5 records and implement (ii), (v) and (vi).

8. Create a database file that will maintain a list of Name, Addresses and Aadhar numbers. Write a program in FoxPro to obtain a popup menu containing the items :

- (i) Add a new record.
- (ii) Delete a record.
- (iii) Modify a record.
- (iv) Retrieve and display an entire record for a given Aadhar number.
- (v) Generate a complete list of all records.
- (vi) Exit from menu.

Enter 5 records and implement (iii), (v) and (vi).

9. Create a database file containing the list of countries and their corresponding capitals. Write a program in FoxPro to obtain a popup menu containing the items :

- (i) Add a new record.

- (ii) Searching the country whose capital is given.
- (iii) Searching the capital whose country is given.
- (iv) Delete a record.
- (v) Generate a complete list of all countries and capitals.
- (vi) Exit from menu.

Enter 5 records and implement (i) and (vi).

10. Create a database file containing the list of countries and their corresponding capitals. Write a program in FoxPro to obtain a popup menu containing the following items :

- (i) Add a new record.
- (ii) Searching the country whose capital is given.
- (iii) Searching the capital whose country is given.
- (iv) Delete a record.
- (v) Generate a complete list of all countries and capitals.
- (vi) Exit from menu.

Enter 5 records and implement (ii) and (vi).

11. Create a database file containing the list of countries and their corresponding capitals. Write a program in FoxPro to obtain a popup menu containing the following items :

- (i) Add a new record.
- (ii) Searching the country whose capital is given.

- (iii) Searching the capital whose country is given.
- (iv) Delete a record.
- (v) Generate a complete list of all countries and capitals.
- (vi) Exit from menu.

Enter 5 records and implement (iii) and (vi).

12. Create a database file containing the list of countries and their corresponding capitals. Write a program in FoxPro to obtain a popup menu containing the following items :

- (i) Add a new record.
- (ii) Searching the country whose capital is given.
- (iii) Searching the capital whose country is given.
- (iv) Delete a record.
- (v) Generate a complete list of all countries and capitals.
- (vi) Exit from menu.

Enter 5 records and implement (iv) and (vi).

13. Create a database file containing the list of countries and their corresponding capitals. Write a program in FoxPro to obtain a popup menu containing the following items :

- (i) Add a new record.
- (ii) Searching the country whose capital is given.
- (iii) Searching the capital whose country is given.

- (iv) Delete a record.
- (v) Generate a complete list of all countries and capitals.
- (vi) Exit from menu.

Enter 5 records and implement (v) and (vi).

14. Create a database file containing the list of countries and their corresponding capitals. Write a program in FoxPro to obtain a popup menu containing the following items :

- (i) Add a new record.
- (ii) Searching the country whose capital is given.
- (iii) Searching the capital whose country is given.
- (iv) Delete a record.
- (v) Generate a complete list of all countries and capitals.
- (vi) Exit from menu.

Enter 5 records and implement (i), (v) and (vi).

15. Create a database file containing the list of countries and their corresponding capitals. Write a program in FoxPro to obtain a popup menu containing the following items :

- (i) Add a new record.
- (ii) Searching the country whose capital is given.
- (iii) Searching the capital whose country is given.
- (iv) Delete a record.

- (v) Generate a complete list of all countries and capitals.
- (vi) Exit from menu.

Enter 5 records and implement (iv), (v) and (vi).

16. Write a program in FoxPro that will maintain a list of roll numbers, name and marks of students. Include a menu that will allow the user to select any of the following activities.

- (i) Add a new record.
- (ii) Delete a record.
- (iii) Search a record.
- (iv) Generate a complete list of roll no., names and marks.
- (v) End of execution.

Enter 5 records and implement (i) and (v).

17. Write a program in FoxPro that will maintain a list of roll numbers, name and marks of students. Include a menu that will allow the user to select any of the following activities.

- (i) Add a new record.
- (ii) Delete a record.
- (iii) Search a record.
- (iv) Generate a complete list of roll no., names and marks.
- (v) End of execution.

Enter 5 records and implement (i) and (v).

18. Write a program in FoxPro that will maintain a list of roll numbers, name and marks of students. Include a menu that will allow the user to select any of the following activities.

(i) Add a new record.

(ii) Delete a record.

(iii) Search a record.

(iv) Generate a complete list of roll no., names and marks.

(v) End of execution.

Enter 5 records and implement (ii) and (v).

19. Write a program in FoxPro that will maintain a list of roll numbers, name and marks of students. Include a menu that will allow the user to select any of the following activities.

(i) Add a new record.

(ii) Delete a record.

(iii) Search a record.

(iv) Generate a complete list of roll no., names and marks.

(v) End of execution.

Enter 5 records and implement (iii) and (v).

20. Create a database file for books on a library with the fields Title, Author, Acc No., Call No., Subject, Branch, Issuing card no and Date of issue and write a program in FoxPro

maintains a database file for books on a library to obtain a popup menu containing the items :

- (i) Entry of new book.
- (ii) Entry of new number.
- (iii) Listing of books issued by a number.
- (iv) Searching of a book according to Title.
- (v) Exit from menu.

Enter 5 records and implement (iv) and (v).

21. Write a program in FoxPro that will maintain a list of roll numbers, name and marks of students. Include a menu that will allow the user to select any of the following activities.

- (i) Add a new record.
- (ii) Delete a record.
- (iii) Search a record.
- (iv) Generate a complete list of roll no., names and marks.
- (v) End of execution.

Enter 5 records and implement (i), (ii) and (v).

22. Write a program in FoxPro that will maintain a list of roll numbers, name and marks of students. Include a menu that will allow the user to select any of the following activities.

- (i) Add a new record.

- (ii) Delete a record.
- (iii) Search a record.
- (iv) Generate a complete list of roll no., names and marks.
- (v) End of execution.

Enter 5 records and implement (i), (iii) and (v).

23. Write a program in FoxPro that will maintain a list of roll numbers, name and marks of students. Include a menu that will allow the user to select any of the following activities.

- (i) Add a new record.
- (ii) Delete a record.
- (iii) Search a record.
- (iv) Generate a complete list of roll no., names and marks.
- (v) End of execution.

Enter 5 records and implement (i), (iv) and (v).

[Note book and Viva : 05 marks]
