Reg. No. : | | | | | | | | | | | | |

Question Paper Code : J1502

M.Sc. DEGREE EXAMINATION, FEBRUARY/MARCH 2018.

First Semester

Computer Science

DCS 7102 — PROBLEM SOLVING AND PROGRAMMING

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is a Program verification?

2. Write a few words on Problem Solving.

3. What are the steps involved in creating a program in C?

4. Write a simple C program to add two integers.

5. Write the syntax of FOR loop with an example.

6. Differentiate between while and do...while.

7. What is an Operator?

8. Define Array.

9. Write the major differences between printf and scanf statements.

10. Define Macros.

PART B — (5 × 13 = 65 marks)

11. (a) Explain the procedure for Analysis of Algorithms. (13)

Or

(b) Describe the steps involved in calculating the Efficiency of Algorithms. (13)

12. (a) Explain the following with a suitable programs :

(i) Relational Operators. (6)

(ii) Arithmetic Operators. (7)

Or

(b) Explain the following :

(i) Control Structures. (4)

(ii) The if selection statement. (4)

(iii) Write a program to find whether the given number is odd (or) even. (5)

13. (a) Discuss in detail about :

(i) Switch ... Break....Continue Statement. (6)

(ii) Explain the usage of Header files with examples. (7)

Or

(b) (i) Write a program to perform addition of two matrices. (6)

(ii) Discuss about Passing values from Array to Functions with examples. (7)

14. (a) (i) Explain the relationship between Pointers and Arrays. (6)

(ii) Write on string handling in detail. (7)

Or

(b) (i) Explain the various types of Bitwise Operators. (6)

(ii) Describe the Syntax and usage of Unions. (7)

15. (a) (i) Explain the steps involved in creating, reading and accessing of sequential files. (6)

(ii) How formatting of input files is carried out with scant? Explain. (7)

Or

(b) (i) Explain how to create a Random File. (6)

(ii) Discuss about Symbolic Constants. (7)

PART C — (1 × 15 = 15 marks)

16. (a) Write a C program to Create a Random File. Assume your own file layout.

Or

(b) Write a C program to sort the given 10 number in ascending order. Print the output.

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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : BS2502

M.Sc. DEGREE EXAMINATION, AUGUST/SEPTEMBER 2017.

First Semester

Computer Science

DCS 7102 — PROBLEM SOLVING AND PROGRAMMING

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define divide-and-conquer strategy.

2. List the techniques that are considered as variations on the basic dynamic programming.

3. Mention the rules to be considered for naming the variable.

4. List the data types based on fundamental and user defined with its purpose.

5. Distinguish “iteration and recursion”.

6. How is function definition distinguished from function call?

7. State the difference between structure and union.

8. What is a pointer and state one application of a pointer?

9. What are File I/O functions?

10. What is the use of size of operator? Give example.

PART B — (5 × 13 = 65 marks)

11. (a) Explain the concepts of Top-down design with schematic diagram. (13)

Or

(b) Explain the concepts of designing efficient algorithms. (13)

12. (a) Discuss various decision structures used in problem solving with suitable examples. (13)

Or

(b) Write a pseudo code and draw the flowchart to generate the Fibonacci series using recursion. (13)

13. (a) Write a program to read a list of n random numbers and count the number of odd, zero, even numbers in the list and also print the sum of all odd numbers. (13)

Or

(b) Write short notes on the following :

(i) Rule based Programming (6)

(ii) Structured Programming. (7)

14. (a) Write a program using pointers to read an array of strings and print in reverse Order. (13)

Or

(b) Write the program for Sorting of names using 2-D array without using string handling functions. (13)

15. (a) Discuss the formatted I/O statements with two examples each. (13)

Or

(b) Two files DATA 1 and DATA 2 contain sorted list of integers. Write a program to-produce a third file DATA which hold a single sorted, merged list of these two lists. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Apply the problem solving techniques for simple engineering problems. (15)

Or

(b) Write a program that will generate a data file containing the list of customers and their corresponding telephone numbers. Use a structure variable to store the name and telephone of each customer. Write code to determine the telephone number of a specified customer. (15)

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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : KJ1502

M.Sc. DEGREE EXAMINATION, FEBRUARY/MARCH 2017.

First Semester

Computer Science

DCS 7102 — PROBLEM SOLVING AND PROGRAMMING

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define program verification.

2. Why do we need documentation?

3. What is rule based programming?

4. Write an algorithm for exchanging the values of two variables without temporary variable.

5. How do you find the time complexity of a given algorithm?

6. What is the syntax of switch..case statement?

7. Write a C program to find the given number is prime or not.

8. What is a pointer?

9. Write down the syntax of various string handling functions.

10. Mention any two rules of pointer operations.

PART B — (5 × 16 = 80 marks)

11. (a) With an example, explain how to analyse an algorithm. (16)

Or

(b) Explain about Top-Down design in detail. (16)

12. (a) Discuss in detail about various control structures. (16)

Or

(b) (i) Write an algorithm to find the Second Maximum in an array. (8)

(ii) Draw a flowchart to find average of 10 numbers. (8)

13. (a) (i) Compare while and do-while statements in C. (6)

(ii) Explain the syntax of switch-case statement. (10)

Or

(b) Write a 'C' program to multiply the given two matrices. (16)

14. (a) Write the purpose of different storage classes in C with example.

Or

(b) Discuss about :

(i) Structure within structure (8)

(ii) Array of pointers. (8)

15. (a) Explain about the I/O operations in files using C with example. (16)

Or

(b) Define Preprocessors and its directives. How do you pass command line arguments? Explain with an illustration. (16)

Reg. No. | | | | | | | | | | | | | |

Question Paper Code : J1527

M.Sc. DEGREE EXAMINATION, AUGUST/SEPTEMBER 2016.

(From Academic Year – 2015 – New Question Paper Pattern)

First Semester

Computer Science

DCS 7102 — PROBLEM SOLVING AND PROGRAMMING

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is input assertion and output assertion?
2. What is working backwards from the solution?
3. Write the precedence of operators in C.
4. Find the biggest among two numbers using ternary operator.
5. Write a note on function prototypes.
6. Distinguish between auto and extern storage classes.
7. Find the error in the following program segment:

   Assume int $b[10] = \{0\}$, i;

   for $(i = 0; i <= 10; i++)\{$

   $b[i]$=1;

   }.
8. What is the difference in getting a string using scanf and gets functions?
9. Differentiate '#' and '##'.
10. What is the purpose of #error directive?

PART B — (5 × 13 = 65 marks)

11. (a) Draw the schematic-breakdown of a problem of your own using top-down design.

Or

(b) How algorithms can be implemented in the target programming language? Explain the various components in it.

12. (a) (i) Write program that reads in the radius of a circle and prints the circle's diameter, circumference and area as a menu driven one. The program should continue till the user wishes to continue. Use the constant value 3.14159 for pi value. (10)

(ii) What are the increment and decrement operators available in C? Give an example. (3)

Or

(b) Write a C program to process the following scenario:

Admission to a professional course is subject to the following conditions:

(i) Marks in Maths > = 60

(ii) Marks in Physics > = 50

(iii) Marks in Chemistry > = 50

(iv) Total in all three subjects > = 200 and < = 300 Or Total in Maths and Physics > = 150

Code the above and output the list of eligible candidates using both if-else and switch statements.

13. (a) (i) Compare iteration and recursion in problem solving. (3)

(ii) One large chemical company pays its salespeople on a commission basis. The salespeople receive Rs.200 per week plus 9% of their gross sales for that week. Develop a program that will input each salesperson's gross sales for last week and will calculate and display that salesperson's earnings. Process one salesperson's figures at a time using a function called 'commission'. (10)

Or

(b) (i) Write the syntax of 'for' loop and explain each of its elements. (5)

(ii) Using a recursive function, calculate the factorial and power of a number and use it to calculate the value of the Series: $x/1!+x^2/2!+x^3/3!+...+x^n/n!$. (8)

14. (a) (i) What are pointers? Write its purpose? (3)

(ii) Using pointers, swap two numbers without using a temporary variable. (10)

Or

(b) (i) What are strings? List all its operations. (3)

(ii) A small airline has just purchased a computer for its new automated reservations system. Write a program to assign seats on each flight of the airline's only plane (capacity : 10 seats).

The program should display the following menu of alternatives:

Please type 1 for "first class"

Please type 2 for "economy".

If the person types 1, then the program should assign a seat in the first class section (seats 1 – 5). If the person types 2, then the program Should assign a seat in the economy section (seats 6 –10). The program should, of course, never assign a Seat that has already been assigned. When the first class section is full, the program should ask the person if it's acceptable to be placed in the economy section (and vice versa). If yes, then make the appropriate seat assignment. If no, then print the message "Next flight leaves in 3 hours." (10)

15. (a) (i) Explain how a sequential access file will be Created? (3)

(ii) Consider the system given in 14. (b) (ii) create a file called 'airline.txt' and store all the reservation details in it. Also, prepare a reservation report based on the different person types. (10)

Or

(b) Write a program to create a file for students marks records. Display the individual mark statement as well as a complete class report based on the option given. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Apply pointer to an array to calculate the candidates interview marks based on aptitude marks and technical interview marks. Display the candidates with more than 80 interview marks.

Or

(b) Demonstrate the application of files in an inventory management system in which the items are stored and retrieved based on the purchase and sales. Display the items that reaches 're-order level' based on the option given.

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Reg. No. : | | | | | | | | | | | | | |

Question Paper Code : S1502

M.Sc. DEGREE EXAMINATION, FEBRUARY/MARCH 2016.

First Semester

Computer Science

DCS 7102 — PROBLEM SOLVING AND PROGRAMMING

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define: Algorithm.

2. Given a incentive table of the kind given below, write an algorithm to compute the incentive amount, on a sales.

Sales	Incentive
0 <= Sales <=100000	0
100001 <= Sales <=200000	0 + 0.10*(Sales–100000)
200001 <= Sales <=300000	10000 + 0.20*(Sales–200000)
300001 <= Sales	30000 + 0.30*(Sales–300000)

3. List the relational and logical operators of C.

4. Give any four libraries available in C.

5. List the benefits of looping structures.

6. Differentiate between break and continue.

7. What is a pointer? Consider the following program code and write the result.

```
include <stdio.h>
int main ()
{
    char ch = a;
    char*p1, *p2;
    p1 = &ch;
    p2 = p1;
    printf (" *p1 = %c And *p2 = %c", *p1, *p2); }
```

8. List any four string handling operations with an example for each.

9. List the operators used for formatted I/O in C.

10. What are called as symbolic constants? Give an example.

PART B — (5 × 16 = 80 marks)

11. (a) (i) What are the different types of problem solving methods? Explain them in detail. (8)

(ii) Apply the different problem solving techniques to a "Payroll Calculation System" for an organization. (8)

Or

(b) How efficiency analysis of algorithms is done? Consider "Number Sorting Algorithm" using any two sorting techniques and analyze the same based on space and time complexity based analysis. (16)

12. (a) What is the purpose of control structures in C? Explain the different types of it with an example for each. (16)

Or

(b) Write an algorithm for

(i) Counting odd and even numbers (8)

(ii) Factorial computation (8)

with input, output and processing details.

13. (a) Write a C program to compute the sum of squares of a list of numbers given as input. (16)

Or

(b) For the same scenario given in Qn.2 (Part-A) develop a C code with appropriate control structure. (16)

14. (a) What are arrays of pointers? Where will you use it? Give an example. (16)

Or

(b) What are pointers to functions? Write a pointer to a function that receives a character string and a character as argument and delete all the occurrences of this character in the string. The function should return the corrected string without any blank spaces. (16)

15. (a) Using C, create an employee file for an organization having a number of employees. Each employee record should contain employee information and their salary details. After creating this file, open it and compute the gross pay and net pay for each employee and display the same as a report. (16)

Or

(b) Create a random access file for a collection of employee records with each record represents one employee in C to create the file and to perform the insertion operation and finally display the pay details of the employee. (16)

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 80502

M.Sc. DEGREE EXAMINATION, AUGUST 2015.

First Semester

Computer Science

DCS 7102 — PROBLEM SOLVING AND PROGRAMMING

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What do you mean by straight-line program segments?
2. What is an identifier?
3. What are different programming paradigm?
4. Define escape sequence. Write any two escape sequence characters with meaning.
5. What is the syntax of switch..case statement?
6. What is the difference between post-decrement and pre-increment operators?
7. Write a C program to exchange two numbers without using intermediate variable.
8. What is a pointer arithmetic?
9. Give the purpose of Macros.
10. Give the important feature of preprocessor.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the steps in analyzing the algorithm. (8)

(ii) Compare about while loop and do... while loop with illustration. (8)

Or

(b) (i) Explain the need for program verification. (8)

(ii) Explain about Top-Down design in detail. (8)

12. (a) Compare and contrast between recursion and iteration with illustration. (16)

Or

(b) (i) Write a program to find the second minimum in an array. (8)

(ii) Draw a flowchart to find minimum and maximum in a given list of numbers. (8)

13. (a) Explain about programming life cycle phases. (16)

Or

(b) Explain about various if statements with illustration. (16)

14. (a) Explain about different storage classes in C with neat illustration. (16)

Or

(b) Explain about :

(i) Structure with Pointers (8)

(ii) Function returning pointers with illustration. (8)

15. (a) Explain about various File operations in C with example. (16)

Or

(b) (i) Explain about dynamic memory allocation. (8)

(ii) What is the purpose of command line arguments? Explain with a neat illustration. (8)

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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 22453

M.Sc. DEGREE EXAMINATION, FEBRUARY/MARCH 2015.

First Semester

Computer Science

DCS 7102 — PROBLEM SOLVING AND PROGRAMMING

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Program.
2. What is program verification?
3. Define Executable file.
4. List the rules of precedence.
5. What is argument coercion?
6. How static storage class is used? Give an example.
7. What is indirection operator?
8. What is a constant pointer?
9. Write the use of left, right and internal stream manipulators.
10. Differentiate the purposes of # and ##.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Briefly explain the general and powerful computational strategies. (4)

(ii) Explain top-down design in detail. (12)

Or

(b) (i) How program verification is done with respect to program segments, program segments with branches and program segments with loops? (8)

(ii) What is Order notation and how probabilistic average case analysis is done while analyzing the complexity of an algorithm? (8)

12. (a) (i) How if-else if ladder works? Write its syntax and explain. (4)

(ii) Write a program to display the grade of a student using if-else if ladder. (12)

Or

(b) (i) How decision making is done using equality and relational operators? (4)

(ii) Write a program to find whether the given number is a positive or negative or zero or odd or even using simple if-statement. (12)

13. (a) (i) How top-down, step-wise refinement algorithms can be written using nested control structures? (6)

(ii) Write a program to find the total number of passes and failures of a class of 60 students using nested control structures. (10)

Or

(b) (i) How the 'for' repetition statement works? Write its syntax and explain all its elements. (8)

(ii) Write a program to print the sum of prime numbers from a given set of numbers. (8)

14. (a) (i) What is pointer to a function? (4)

(ii) Write a program to sort the given numbers in ascending and descending order using pointer to a function. (12)

Or

(b) (i) Differentiate structures and unions. (4)

(ii) Create an employee structure for an organization having 50 employees. Each employee record should contain employee personal information and their pay details. After creating this structure, compute the gross pay and net pay for each employee and display the same as a report. (12)

15. (a) (i) How a sequential access file will be created? (4)

(ii) Create a sequential access file for a Bank. The bank has several account records and each record contains accno, type, name of the customer and balance amount details. After creation, access this file and display the customers have less than 1000 as their balance amount. (12)

Or

(b) (i) Write the purpose of random access file. (4)

(ii) Create a random access file for transaction processing system for a bank. (12)

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 96452

M.Sc. DEGREE EXAMINATION, FEBRUARY/MARCH 2014.

First Semester

Computer Science

DCS 7102 — PROBLEM SOLVING AND PROGRAMMING

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is a variable?
2. Define program verification.
3. Define rule based programming
4. Define escape sequence. Write any two escape sequence characters with meaning.
5. What is the syntax of nested if statement?
6. What is the difference between pre-increment and post-increment operators?
7. Write a C program to swap two numbers without using intermediate variable.
8. What is pointer arithmetic?
9. What is the purpose of Macros?
10. What is the salient feature of pragma operators?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain briefly about implementation of algorithm. (6)

(ii) Explain about while loop and do.. while loop with illustration. (10)

Or

(b) (i) Explain the need for program verification. (8)

(ii) Explain about Top-Down design in detail. (8)

12. (a) (i) Explain in detail about recursion with illustration. (8)

(ii) Illustrate with an example for passing arrays to functions. (8)

Or

(b) (i) Write a program to find the second maximum in an array.

(ii) Draw a flowchart to find odd or even in a given list of numbers.

13. (a) Explain about programming life cycle phases.

Or

(b) (i) Explain the control structures in C programming. (8)

(ii) Write a C program using functions to find the sum of n numbers. (8)

14. (a) Explain about different storage classes in C with example.

Or

(b) Explain with example

(i) Function with Pointers

(ii) Structure within structure.

15. (a) Explain about the reading and writing operations in Files using C with example.

Or

(b) (i) Explain about dynamic memory allocation.

(ii) How do you pass command line arguments? Explain with illustration.

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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 46452

M.Sc. DEGREE EXAMINATION, AUGUST 2014.

First Semester

(Computer Science)

DCS 7102 — PROBLEM SOLVING AND PROGRAMMING

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is top-down design?
2. What is verification of straight-line program segments?
3. Write short notes on C standard library.
4. Write about arithmetic operators in C.
5. What are repetition essentials?
6. Write short notes on logical operators.
7. What is pointer?
8. Write short notes on bit wise operators.
9. Write about files and streams.
10. What is #error directive?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain termination of loops with example. (8)

(ii) Write brief notes on debugging programs. (8)

Or

(b) (i) Discuss briefly about implications and symbolic execution. (8)

(ii) Describe in detail about computational complexity. (8)

12. (a) (i) Explain equality and relational operators with example. (8)

(ii) Describe increment and decrement operators with example. (8)

Or

(b) (i) Write brief notes on control structures. (8)

(ii) Briefly discuss about if/else selection structure with example. (8)

13. (a) (i) Discuss briefly about Counter-controlled repetition. (8)

(ii) Explain switch multiple-selection statement with example. (8)

Or

(b) (i) Write any eight header files with its descriptions. (8)

(ii) Describe passing arrays to functions with example. (8)

14. (a) (i) Explain in detail about pointer operations with example. (8)

(ii) Write brief notes on pointer expressions and pointer arithmetic. (8)

Or

(b) (i) Describe character-handling library with prototype and its function description. (8)

(ii) Explain enumeration constants with example. (8)

15. (a) (i) Describe how to read data from a sequential-access file with example. (8)

(ii) Explain how to create a random access file with example. (8)

Or

(b) (i) Write brief notes on conditional compilation. (8)

(ii) Explain predefined symbolic constants. Write some constants with its description. (8)
