

For Library Use

B II (Three Year H)
Under 1+1+1 System

North Bengal St. Xavier's College
Library

Rajshahi, Post Box No.-1
Ph. - 735134, Dist.- Jalpaiguri

2018

COMPUTER SCIENCE (Honours)

THIRD PAPER

(Revised New Syllabus)

Time : 4 hours

Full Marks : 100

The figures in the margin indicate full marks.

GROUP—A

Answer any two questions.

1. (a) What is a variable? 2
(b) Discuss iterative statements. 6
(c) Explain any five data types. 10
(d) What is scope of a variable? 2
2. (a) What are identifiers? Give some examples. $2+3=5$
(b) What are operators? Discuss relational operators. $2+5=7$
(c) Write a program in C to arrange n numbers in increasing order. 6
(d) What is operator precedence? 2

(2)

3. (a) Discuss some string handling functions with suitable examples. 6
(b) Explain recursion with an example. 4
(c) Differentiate between pointers and arrays. 5
(d) Explain linked list. 5

GROUP—B

Answer any **two** questions.

4. (a) What is data structure? Discuss different data structures with examples. $2+6=8$
(b) Describe the different steps to convert a tree into a binary tree. Explain with the help of an example. $4+3=7$
5. (a) What is stack? Discuss different stack operations. $2+4=6$
(b) Discuss infix to postfix conversion with the help of an example. 6
(c) What is queue? 3
6. (a) Write down the binary search algorithm. 6
(b) Discuss hashing with the help of an example. 5
(c) Discuss heap sort. 4

8MRD/151

(Continued)

(3)

GROUP—C

Answer any **two** questions.

7. (a) What is deadlock? What are the necessary conditions for deadlock to occur? $2+4=6$
(b) Discuss distributed model. 4
(c) Explain semaphores. 5
8. (a) Discuss round-robin scheduling. 5
(b) What is the function of interrupt handlers? 4
(c) Discuss paging. 4
(d) What is virtual memory? 2

9. Write notes on any **three** of the following : $5 \times 3 = 15$

- (a) Non-deterministic finite automata
(b) Turing machine
(c) Loaders
(d) Phases of compilation

8MRD—720/151

B II (Three Year H)
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2017

COMPUTER SCIENCE (Honours)

THIRD PAPER

(Revised New Syllabus)

Full Marks : 100

Time : 4 hours

The figures in the margin indicate full marks.

GROUP—A

Answer any **two** questions.

1. (a) Explain the scope and extent of an identifier with suitable examples. 6
(b) What do you mean by metalanguage? Express an identifier and a number using BNF. 1+4
(c) Discuss operator precedence and associations in C. 6
(d) What do you mean by data abstraction? Explain. 3
2. (a) Discuss enumerated and pointer data types along with their uses. 6
(b) Discuss relative merits and demerits of call by value and call by reference. 4
(c) Explain the operations of two-way and multiway branching in C. Take suitable examples. 10

(Turn Over)

MR7/146

(2)

3. (a) Discuss two formatted input and two formatted output statements in C. 4
- (b) What do you mean by recursion? Write a code segment in C for computing $n!$ using recursion. 1+4
- (c) Write a C code program segment for implementing singly linked list. 5
- (d) What is meant by loop? Discuss different types of loops in C with examples. 6

GROUP—B

Answer any two questions.

4. (a) Define a tree and a binary tree. How can you convert a tree to an equivalent binary tree? Explain with an example. 2+6
- (b) Explain the merits and demerits of sequential allocation and linked allocation. 7
5. (a) Explain two linear data structures along with their application in computer science. 6
- (b) Explain partition exchange soiling technique with an example. Show the passes clearly. 9

MR7/146

(Continued)

(3)

6. (a) Discuss division remainder method of hashing with a suitable example. 6
- (b) What do you mean by postfix expression? What are the advantages of postfix form? 4
- (c) Calculate the efficiency of binary search. 5

GROUP—C

Answer any two questions.

7. (a) Explain a deadlock situation using an example. What are the necessary conditions of a deadlock situation in connection with an OS? 4+2
- (b) Write a note on interrupt handlers. 4
- (c) What are the typical activities that are done by kernel of an OS? 5
8. (a) Discuss deterministic and non-deterministic finite automata and their equivalence. 7
- (b) What are the function differences between a compiler and an interpreter? 3
- (c) Discuss various phases of a typical compiler with a flow diagram. 5

MR7/146

(Turn Over)

(4)

9. Write notes on any **three** of the following :

5×3=15

- (a) Linkers and loaders
- (b) Turing machine
- (c) UNIX
- (d) Semaphores and monitors

B II (Three Year H)
Under 1+1+1 System

2016

COMPUTER SCIENCE (Honours)

THIRD PAPER

(Revised New Syllabus)

Time : 4 hours

Full Marks : 100

The figures in the margin indicate full marks.

GROUP—A

Answer any **two** questions.

1. (a) Explain call by name, call by value and call by reference using examples. 9
- (b) What is data abstraction? 3
- (c) Discuss about elementary, enumerated pointer and structure data types. 8
2. (a) Write a note on formatted I/O statements in C. 5
- (b) What is a subprogram? Explain its usefulness. 1+4=5
- (c) What is meant by scope and extent of an identifier? Explain with an example. 5
- (d) Explain the necessity of initialization of an identifier with examples. 5

RM16/105

(Turn Over)

MR7—640/146

(2)

3. (a) Explain the differences between structure and union in C. 5
- (b) What is a datafile? How can you copy a sequential datafile to another sequential file in C? Write a small program code in C for this. 6
- (c) How can you code a multiway selection program coding in C? Give example. 5
- (d) Discuss pointers to functions and structures. 4

GROUP—B

Answer any **two** questions.

4. (a) What are the relative merits and demerits of sequential allocation and linked allocation of memory spaces? 5
- (b) Discuss the differences between an array and a list. 4
- (c) What is a binary tree? Write an algorithm to convert a tree to a binary tree. 6
5. (a) Explain three types of hash functions. 6
- (b) Discuss the problems with different hashing techniques and the methods to resolve those problems. $4+3=7$
- (c) What do you mean by nonlinear data structure? 2

RM16/105

(Continued)

(3)

6. (a) Write down a sorting algorithm having $O(n \log_2 n)$ performance. 6
- (b) Write a note on recursion vs. iteration. 5
- (c) Compare singly linked list with doubly linked list. 4

GROUP—C

Answer any **two** questions.

7. (a) Discuss three-page replacement techniques with their merits and demerits. 6
- (b) What is a semaphore? Write the functions of a binary semaphore. $1+4=5$
- (c) Explain a deadlock situation with an example. 4
8. (a) What do you mean by regular expression? Give an example. 4
- (b) Discuss the functions of a loader and a linker. 6
- (c) Discuss the various phases of a typical compiler. 5

RM16/105

(Turn Over)

(4)

9. Write notes on any **three** of the following :

5×3=15

- (a) Client-server technology
- (b) Deterministic and non-deterministic finite automata
- (c) Turing machine
- (d) Assemblers

B II (Three Year H)
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2015

COMPUTER SCIENCE (Honours)

THIRD PAPER

(Revised New Syllabus)

Time : 4 hours

Full Marks : 100

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GROUP—A

Answer any **two** questions.

1. (a) Explain BNF with examples. 5
- (b) Explain initialization of variables in programming. 3
- (c) Discuss the merits and demerits of call by value and call by reference techniques of parameter passing. 6
- (d) What do you mean by structured data? Explain with examples. 6
2. (a) What is recursion? Give example. Write a small code segment of recursion implementation in C. 1+1+4

RM16—530/105

DR15—560/106

(Turn Over)

- (b) What is a file? Give a program segment in C for implementing a sequential file. 1+5
- (c) Explain assignment, increment, decrement and conditional operators in C. Give examples. 8
3. (a) Discuss multidimensional array with example. 6
- (b) Give a simple C program code for implementing singly linked list. 6
- (c) Explain the differences between structure and union in C. 4
- (d) Discuss four string handling functions in C. 4

GROUP—B

Answer any **two** questions.

4. (a) Write the algorithm for radix technique of sorting. 6
- (b) What do you mean by collision in hashing? How do you resolve the said problem? 2+4
- (c) Explain stack and queue operations. 3

6. (a) Explain the necessity of converting a tree into its equivalent binary tree. 4
- (b) What do you mean by path length of a binary tree? Give example. What is the necessity of determining path length of a binary tree? 3+3
- (c) Write the algorithm of binary search. 5
6. (a) Convert the following into its equivalent post-fix form :

$$c - (d / f) / (e / g) + (a / b) * c$$
 5
- (b) Discuss two different hash functions with their merits and demerits. 6
- (c) What do you mean by complexity of an algorithm? Discuss. 4

GROUP—C

Answer any **two** questions.

7. (a) Explain a deadlock situation in context to an OS with an example. 5
- (b) Discuss various phases of a typical compiler explaining tasks of each phase. 7
- (c) What do you mean by critical resource and critical region? Give examples. 3

(4)

8. (a) Explain paging scheme in virtual memory management.
- (b) What do you mean by bootstrap loader?
- (c) What are the differences between deterministic and non-deterministic finite automata?

9. Write notes on (any **three**) :

5×3=15

- (a) UNIX
- (b) Client-server technology
- (c) Cross-compilers
- (d) Turing machine

(4)

8. (a) What is a cross-compiler?
- (b) Explain the differences between compiler and an interpreter.
- (c) Discuss deterministic and non-deterministic finite automata.
- (d) What is turing machine?

5×3

9. Write notes on (any **three**) :

- (a) Deadlock
- (b) UNIX
- (c) Memory management
- (d) Synchronization
- (e) Security and protection
