UG(C) — BCA (3005)

2023(New)

Time : 3 hours

Full Marks : 70

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

The figures in the margin indicate full marks.

Answer from both the Sections as directed.

Section – A

Answer any **four** questions of the following :

$$10 \times 4 = 40$$

1. Define sample space and find it for tossing of two coins.

2. Define random variable and distribution function of discrete random variables.

3. Define Poisson distribution.

4. Define correlation coefficient and prove that its lies between – 1 and 1.

5. Define regression coefficient.

JZ– 84/2 (Turn over)

6. Prove that, if one regression coefficient is greater than unity, then the other must be less than unity.

7. Find range and standard deviation for the data

    87, 99, 75, 87, 94, 75, 35, 88, 87..

8. Find the correlation coefficient by Karl Pearson's method :

x	y
10	3
17	8
12	12
13	8
14	6
15	3

Section – B

Answer **all** questions of the following : $3 \times 10 = 30$

9. Prove that $P(E) + P(E') = 1$.

10 Prove that $A \subseteq B \Rightarrow P(A) \leq P(B)$.

11. A random variable x has the following probability values :

x	P(x)
0	0
1	k
2	2k
3	3k
4	4k

then, find the value of k.

12. Prove that the mean and variance of a Poisson distribution are equal.

13. Calculate the coefficient of correlation between the value of x and y :

X	Y
78	125
89	137
97	156
69	112
59	107
78	136
68	123
61	108

14. Obtain the equations of two lines of regression for the following data :

X	Y
65	67
66	68
6	65
67	68
68	72
69	72
70	69
72	71

15. Explain the properties and application of Chi-square distribution.

16. For the following set of points {(−2,−1), (1,1), (3, 2)} Find the least sqaure regression line.

17. Write short note on Hypothesis testing procedure.

18. Write short note on the Test of goodness of fit.

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UG(C) — BCA (3003)

2023(New)

Time : 3 hours

Full Marks : 70

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

The figures in the margin indicate full marks.

Answer from both the Sections as directed.

Section – A

Answer any **four** questions of the following :

10×4 = 40

1. What are computer instructions ? Draw the instruction code format of basic computer and indicates the number of bits in each part clearly.

2. What do you nunderstand by DMA data transfer ? Give at least one example data transfer situation where DMA mode would be advantages.

JZ– 82/2

3. What do you understand by instruction pipeline ? Mention the typical stages of such a pipeline.

4. What are different addressing modes available for a typical architecture ?

5. What do you understand by asynchronous data transfer ? What are the two methods of asynchronous data transfer ?

6. Write zero address, one address, two address and three anddress instruction code formats for the instruction $F = (A * B) - (C / D)$.

7. Write and assembly program to print even numbers from 1 to 9.

8. What is assembler ? Explain the function of assembler with neat diagram. Differentiate between one pass assembler and two pass assemblers.

Sections – B

Answer all qeustions : $3 \times 10 = 30$

9. What is the significance of following mnemonics used in assembly program :

(a) XCHG

(b) INC

(c) DEC

10. What are computer registers ?

11. Define opcode and operand.

12. What is the difference between data and instruction ?

13. Perform addition of 1000 and 1010 using BCD arithmetic.

14. Compare briefly RISC and CISC architecture.

15. What is instructions cycle ?

16. What is program interrupt ?

17. What do you mean by peripheral devices ?

18. Explain birefly floating point representation.

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UG(C) — BCA (3004)

2023(New)

Time : 3 hours

Full Marks : 70

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

The figures in the margin indicate full marks.

Answer from both the Sections as directed.

Section – A

Answer any **four** questions of the following :

10×4 = 40

1. What do you mean by system ? What are the important elements of system ? Draw a neat diagram and explain them.

2. What are different classifications of system ? Explain any three by taking appropriate example.

3. Describe feasibility study ? Discuss any three important feasibility studies during software development.

JZ–83/2

4. Explain System Development Life Cycle and its various phases.

5. Draw a context level DFD of a "Hospital Management System". Make necessary assumptions.

6. What is decision table ? Design a decision table for a system of your choice, explain it.

7. What is software quality assurance ? How does it differ from software quality control.

8. What is software testing ? Why is it important ? Explain any two software testing techniques ?

Section – B

(Compulsory)

Answer **all** questions :　　　　10×3 = 30

9. What is an information system ?

10. What is system planning ?

11. What is data dictionary ?

12. Explain briefly cost benefit analysis ?

13. What is pseudo code ?

14. What do you mean by risk analysis ?

15. What is data analysis ?

16. List three important characteristics of a good
    documentation.

17. Discuss briefly the importance of Software
    maintenance.

18. What are software threats ?

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UG(C) — BCA (3001)

2023(New)

Time : 3 hours

Full Marks : 70

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

The figures in the margin indicate full marks.

Answer from both the Groups as directed.

Group – A

Answer any **four** questions of the following :

$$10 \times 4 = 40$$

1. Compare Linear search and Binary search. Write an algorithm for Binary search in an array.

2. Explain classification of data structure and operation on data structure.

3. What is linked list ? Explain different types of linked list. Write an algorithm to insert a node at the beginning of a singly linked list.

JZ – 80/2 (Turn over)

4. Write a C function to perform insertion and deletion operation on stack.

5. (a) Write an algorithm to delete an element from queue.

   (b) Write an algorithm to evaluate postfix expression.

6. Differentiate between Internal and External Sorting. Write an algorithm to implement Quick sort.

7. Write an algorithm for the following :

   (a) Inorder tree traversal

   (b) Preorder tree traversal

8. Construct an AVL tree with the following data :

   21, 26, 30, 9, 4, 14, 28, 18, 15, 10, 2, 3, 7.

Group – B

Answer **all** questions :   3×10 = 30

9. Define data structure.

10. Mention the disadvantages of an array.

11. Define Sparse array.

12. Differentiate between Stacks and Queues.

13. What is Circular Queue ?

14. Differentiate between Binary Tree and Complete Binary Tree.

15. Define Big-oh notation.

16. What is a degree of a tree ?

17. What is the time complexity of a linear search ?

18. What is Priority Queue ?

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UG(C) — BCA
                                    (3002)

2023(New)

Time : 3 hours

Full Marks : 70

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

The figures in the margin indicate full marks.

Answer from both the Groups as directed.

Group – A

Answer any **four** questions of the following :

10×4 = 40

1. Define data types. Write the different data types available in Java.

2. What is loop ? Also write its types with example.

3. What is constructor overloading ? Explain it with suitable example.

4. Define inheritance. Explain multilevel inheritance with example.

(Turn over)

5. Differentiate between abstract class and interface. Explain how multiple inheritance can be achieved through interface.

6. Define package. Write down the steps to create the package. Also, write the program to use the newly created package.

7. What is Multithreading ? Write the life cycle of a thread.

8. Define exception and its types. Write a program to create user defined exception.

Group – B

Answer **all** questions : 10×3 = 30

9. What is the difference between C++ and Java ?

10. Define Java Virtual Machine (JVM).

11. What is type casting ?

12. Write the usage of ? : operator.

13. Define static member.

14. What is the use of wrapper class ?

15. List any five string functions.

16. Why is java called a platform independent language ?

17. Explain each word in the statement public static void main (String args []).

18. What is the use of final keyword ?