K.L.E. Society's

R. L. Science Institute (Autonomous),

Belagavi.

Question Paper Booklet

BCA III Semester Nov. 2019

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

KLE Society's

Raja Lakhamagouda Science Institute (Autonomous),

Belagavi.

Third Semester BCA Degree Examination Nov - 2019

C52: OOP USING C++

Duration: **3 Hrs** Max Marks: **70**

Instructions to candidates:

1. Attempt all Questions.

I. Answer any FIVE of the following: **5X2=10**

1. State the applications of OOP.
2. What is class and object?
3. What is comment statement? How is it introduced in C++ program?
4. What is inline function? Give example.
5. What is Destructor?
6. List the operators that cannot be overloaded in C++
7. What is exception? State the advantage of using exception handling in program.

II. Answer any SIX of the following : **6X5=30**

8. State the difference between POP and OOP.
9. WAP to perform Addition/Subtraction/Multiplication/Division operations using inline function.
10. Explain the different methods to define the member function of the class with example?
11. Compare and contrast constructors and destructors.
12. Write a program to overload minus (-) operator to change the sign of the data items in an object.
13. Write a program to implement single-level inheritance.
14. Explain try, throw and catch with an example.
15. Write a program to calculate factorial of a number using command line argument.

III. Answer any THREE of the following: **3X10=30**

16. Explain the basic concept of Object Oriented Programming.
17. Write a program to implement Simple Queue using class and object
18. What is Inheritance? Explain different types of Inheritance.
19. Write a program to:
    a) Perform binary search using class template.
    b) Swap two numbers using function template.
20. Write a program to overload binary operator to perform addition and subtraction of two matrices.

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Third Semester BCA Degree Examination Nov - 2019

C54: COMPUTER ORGANIZATION & ARCHITECTURE

Duration: 3 Hrs **Max Marks: 70**

Instructions to candidates:

1) Draw Neat diagrams wherever necessary
2) Give solutions for numerical questions with steps.

I. Answer any FIVE of the following: **5X2=10**

1. What is meant by strobe signal?
2. Define Decoder and Encoder.
3. What is meant by control function?
4. Define Associative memory.
5. Define addressing modes. List any 4 addressing modes.
6. Define the following: Program Interrupt, Opcode.
7. Define Micro operations. Give examples.

II. Answer any SIX of the following : **6X5=30**

8. Explain interrupt cycle with the help of flowchart.
9. Explain the different types of registers.
10. Explain 4:1 MUX.
11. Prove the universal property of NOR gate.
12. State and prove Demorgans theorem.
13. Explain the Input- Output Configuration.
14. Explain the single accumulator CPU organization.
15. Explain asynchronous destination initiated strobe data transfer.

III. Answer any THREE of the following : **3X10=30**

16. **a)** Explain the XOR and XNOR gates.
    b) Explain the concept of store program organization.
17. Explain the general register CPU organization with an example.
18. Write a assembly level program to evaluate the expression
    X= (A+B)*(C + D) using 3-address, 2- address, 1- address and 0 address instructions.
19. **a)** Explain the concept of virtual memory.
    b) Explain the associative mapping wrt cache memory
20. **a)** Explain three basic computer instruction formats.
    b) Perform the following
    i) $(101101)_2 = (?)_{10}$
    ii) $(4CA)_{16} = (?)_{10}$

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Third Semester BCA Degree Examination Nov - 2019

C55: INTRODUCTION TO UNIX

Duration: **3 Hrs** Max Marks: **70**

Instructions to candidates:

1. Attempt all Questions.

I. Answer any FIVE of the following: **5X2=10**

1. What are internal and external commands?
2. List the salient features of UNIX operating system.
3. What is recovering from crash and how it is exhibited?
4. What is pipe? Give an example.
5. What is a process? When it is created?
6. What is soft link?
7. State the use of exit command in a script.

II. Answer any SIX of the following : **6X5=30**

8. Explain the following:

   a)Kernel **b)**Shell **c)** File and Process **d)** System calls

9. Explain the following commands with syntax and example:

   a) cat **b)** cp **c)** rm **d)** mv **e)** file

10. Explain Shell interpretive cycle.
11. Explain process creation mechanism.
12. Explain types of file time stamps.
13. Explain the inode table attributes.
14. Explain looping statements with syntax and example.
15. Write a shell script to calculate simple interest.

III. Answer any THREE of the following: **3X10=30**

16.a) Explain the following general purpose utility commands with syntax, options and example: **i)** cal **ii)** date **iii)** echo **iv)** bc **v)** who

b) Explain parent-child relation in UNIX file system. **[5+5]**

17. Explain UNIX architecture with neat labelled diagram. **[10]**

18.a) Explain the modes of vi editor with a neat diagram.

b) Explain in detail ls –l command with example. **[5+5]**

19.a) Explain common environment variables.

b) Explain basic regular expression character subset. **[5+5]**

20.a) Write a shell script to convert binary to decimal number and hexadecimal.

b) Write a shell script to display the lines in a file containing an entered keyword. **[5+5]**

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C56: DISCRETE MATHEMATICAL STURCTURE

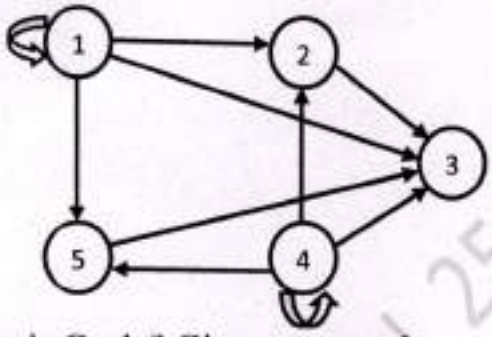
Duration: 3Hrs **Max Marks: 70**

Instructions to candidates:

1) Answer all questions.

I. Answer any FIVE of the following: **5X2=10**

1. How many different arrangements can be made by the letter HISTORY?
2. Solve **i)** ${}^{7}P_3$ **ii)** ${}^{8}P_5$.
3. What is logical equivalence?
4. The Fibonacci numbers are defined recursively by $F_0 = 0, F_1 = 1$ and $F_n = F_{n-1} + F_{n-2}$ for $n \geq 2$. Evaluate F_5 and F_6.
5. Verify that the relation R represented by the following digraph is anty-symmetric and transitive.



6. What is Cycle? Give an example.
7. Write the De-Morgan's laws for any two sets.

II. Answer any SIX of the following : **6X5=30**

8. If ${}^{9}P_5 + 5.{}^{9}P_4 = {}^{10}P_r$, then find r?
9. From 8 gentlemen and 4 ladies, a committee of six is to be formed. In how many ways can be done so that the committee contains i) exactly 2 ladies ii) at least 2 ladies.
10. Prove for any propositions p, q and r, the following compound proposition is tautology. $[(p \rightarrow q) \wedge \{(q \rightarrow r)] \rightarrow (p \rightarrow r)\}$.
11. Prove the law of negation of a conditional and write the negation of the following proposition.

    "If x is not a real number, then it is not a rational number and not an irrational number".
12. Prove by Mathematical Induction that for every positive integer n, 5 devides $n^5 - n$.
13. Find GCD(361, 420). Express it in the form of $420x_0 + 361y_0$.

14. Write all operations on relations.

15. Define transitive closure. Let $R = \{(1,1),(1,3),(2,2),(3,1),(3,2)\}$ on $A = \{1,2,3\}$. Find the matrix of R and also its transitive closure by Warshall's algorithm.

VIII. Answer any THREE of the following: **3X10=30**

16. **a)** How many permutations can be made of the letters of the word MISSISSIPPI taken all at a time? How many of them

i) Begin with 2P's **ii)** Have the 4I's together.

b) Find the factors of the following

i) 990 **ii)** 540

17. Write any five rules of inference.

18. Find the GCD of 65 and 117. Express it in the form of linear combination $65x_0 + 117y_0$. Is the linear combination is unique?

19. Define the following.

i) One-One function **iv)** Composition of mapping

ii) Onto function **v)** Inverse function

iii) Bijective function

20. Consider the sets $A = \{a,b,c\}, B = \{1,2,3\}$ and the relations $R = \{(a,1), (b,1), (c,2), (c,3)\}$ and $S = \{(a,1), (a,2), (b,1), (b,2)\}$ from A to B. Determine $\bar{R}$, $\bar{S}$, $R \cup S, R \cap S, R^c$ and S^c.

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Third Semester BCA Degree Examination Nov – 2019

C60: JAVA PROGRAMMING

Duration: 3Hrs **Max Marks: 70**

Instructions to candidates:

1) Answer all questions.

I Answer any FIVE of the following: **5x2=10**

1. What is JVM?
2. List different types of decision making statements.
3. List access modifiers in Java.
4. How we can hide classes in package?
5. How do we set priorities for thread? Which are 3 priority constants?
6. Which are the 2 types of errors?
7. Explain drawing lines and rectangles methods from graphics class.

II Answer any SIX of the following **6x5=30**

8. Explain java program structure.
9. Explain switch statement with syntax and example in java.
10. Explain constructors with example.
11. Explain single inheritance in Java with example.
12. Explain life cycle of Thread with proper diagram.
13. Explain creating, accessing and using packages with example.
14. Explain with neat diagram applet life cycle.
15. Explain line graphs with example.

III Answer any THREE of the following **3x10 = 30**

16. **a)** Explain features of Java.
    b) Write syntax and program on nested if statement.
17. **a)** Explain different string methods with example.
    b) What is method overloading? Give example.
18. **a)** Explain defining and implementing interface with example.
    b) Explain extending thread class with example.
19. **a)** Explain exception handling using try catch and finally block.
    b) List HTML tags and its functions.
20. **a)** Explain different drawing methods of graphics class with example.
    b) Explain multilevel inheritance with example.

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C61: STATISTICS FOR DATA ANALYSIS

Duration: **3 Hrs** Max Marks: **70**

Instructions to candidates:

1. Attempt all Questions.

I. Answer any FIVE of the following: **5X2=10**

1. What is Dummy variable? Give example.
2. Define central tendency and list its measures.
3. Write the formula and Ms-Excel syntax for Binomial Distribution.
4. Write the formula for sampling variance and population variance.
5. Define hypothesis testing.
6. What are the measures of position?
7. What is Type I and Type II error?

II. Answer any SIX of the following : **6X5=30**

8. Explain three important themes and sub themes of data analysis.
9. Find median for the following data.

Weekly Wages(Rs)	120-140	140-160	160-180	180-200	200-220	220-240	240-260	260-280	280-300	300-320
No. of Employees	8	12	20	30	40	35	18	7	6	4

10. If 10% pens manufactured by company are defective .Find Probability that a box containing 12 pens have.

    a) Exactly two defective pens. **b)** At least two defective pens

11. Explain Complement rule with example.
12. Explain Built-in features of Excel.
13. Calculate Lower Quartile and Upper Quartile for following data

    22,26,14,30,18,11,35,41,12,32

14. Explain the Central limit theorem

15. How to reject null hypothesis using P-value?

VIII. Answer any THREE of the following: **3X10=30**

16. a) Calculate Percentile P_{10}, P_{50} for following data.

22,26,14,30,18,11,35,41,12,32

b) Find the standard deviation and variance for the following data

8,9,15,23,5,11,19,8,10,12

17.a) Explain Additional rule with example.

b) A bag contains 3 pink candies and 7 green candies. Two candies are taken out from the bag with replacement. Find the probability that both candies are pink.

18.a) Calculate the probability that Bender will meet its end-of-July deadline, given the information it has at the beginning of July.

Let A be the event that Bender meets its end-of-July deadline, and let B be the event that Bender receives the materials it needs from its supplier by the middle of July. $P(B) = 2/3$. $P(A|B) = 3/4$. $P(A|\overline{B}) = 1/5$. Calculate $P(A)$ and also draw probability tree.

b) A population is normally distributed with mean 20 and standard deviation 6. Samples of size 9 are drawn from the population. What is the equivalent Z score of the following sample means?

i) 22 **ii)** 25

19. Explain Alternative and null hypothesis with example.

20. a) What is the probability of winning $ 5 times in 12 spins of the spinner?

b) A traffic office imposes on an average 5 number of penalties daily on traffic violators. Assume that the number of penalties on different days is independent and follows passions distribution. What is probability that there will less than 4 penalties in a day?

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Third Semester BCA Degree Examination Nov – 2019

C62: CLOUD COMPUTING TECHNICAL ESSENTIAL

Duration: 3Hrs **Max Marks: 70**

Instructions to candidates:

1) Answer all questions.

I Answer any FIVE of the following: **5x2=10**

1. List key benefits of cloud computing
2. What is the purpose of AWS global infrastructure
3. What is Amazon S3 bucket?
4. Explain 2 types of storage included in Amazon EC2.
5. List different compute services provided by AWS.
6. What is Cloud Monitoring? List different monitoring tools
7. What is the usage of CloudFront

II Answer any SIX of the following **6x5=30**

8. Explain key benefits of cloud computing.
9. Explain cloud computing architecture.
10. Explain AWS use cases.
11. Explain steps involved in creating AWS account.
12. Explain 3 storage classes with Amazon S3.
13. Explain features of CloudFront.
14. Which are the Key Compute and Networking Services by AWS.
15. Which are the eight sections of Template structure explain with example.

III Answer any THREE of the following. **3x10=30**

16. Explain types of cloud computing.
17. With a neat block diagram explain shared responsibility model for security.
18. What Amazon Glacier? With a neat diagram explain how the data is stored in Glacier.
19. Explain with neat diagram how VPC is used for disaster recovery.
20. Explain in brief components of Cloud Formation.

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