

लोक सेवा आयोग
नेपाल राष्ट्र बैंक, प्राविधिक, अधिकृत तृतीय, सहायक निर्देशक (सूचना प्रविधि) पदको खुला
प्रतियोगितात्मक लिखित परीक्षा
२०८१।०१।३१

KEY [A]

पत्र : द्वितीय
समय : ३ घण्टा

पूर्णाङ्क : १००

विषय : **Information Technology - II**

उत्तरपुस्तिकामा प्रश्नपत्रको KEY अनिवार्य रूपले उल्लेख गर्नुपर्नेछ । उल्लेख नगरेमा उत्तरपुस्तिका रद्द हुनेछ । परीक्षामा **calculator, mobile** प्रयोग गर्न पाइनेछैन ।

Objective

Time : 30 mins
25x1=25 Marks

Multiple Choice

1. Which of the following is not a segment of memory in java?
 A) Stack Segment B) Heap Segment C) Code Segment D) Register Segment
2. Look at following code snippet in C and choose the correct answer.

```
int x = 9;
if(x%2 == 0);
    printf("The Post-Increment is: %d\n", x++);
if(x%3 == 0)
    printf("\nThe Pre-Decrement is: %d", --x);
```

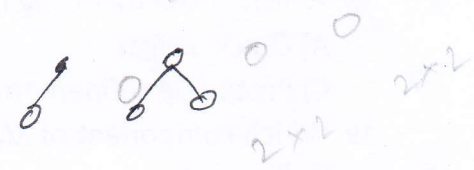
 A) The Post-Increment is: 10 B) The Pre-Decrement is: 8
 C) The Post-Increment is: 9 D) The Pre-Decrement is: 9
3. Which type of virtualization allows multiple virtual machines to share the same operating system kernel?
 A) Full virtualization B) Para virtualization
 C) Hosted virtualization D) Containerization
4. Which of the following is not the application of stack?
 A) Data Transfer between two asynchronous processes
 B) Compiler Syntax Analyzers
 C) Tracking of local variables at run time
 D) Parentheses balancing program
5. The maximum number of binary tree that can be formed with three unlabelled node is

 A) 1 B) 3 C) 4 D) 5
6. Which of the following sorting algorithms follows the divide-and-conquer strategy?
 A) Bubble Sort B) Insertion Sort C) Merge Sort D) Selection Sort
7. Let A order (axb) and B order (cxd) be two matrices, then if AB exists, the order of AB is

 A) axd B) bxc C) axb D) cxd
8. Let the set A is {1, 2, 3} and B is {2, 3, 4}. Then the set A-B is
 A) {1, -4} B) {1, 2, 3} C) {1} D) {2, 3}
9. For any integer $m \geq 3$, the series $2+4+6+\dots+(4m)$ can be equivalent to
 A) m^2+3 B) $m+1$ C) m^m D) $3m^2+4$

$2(1+2+3+\dots+2m)$
 $= 2 \times m$
 m^2
 $25+3$
 55
 $3.5+4$

$2+4+6+8+10$



8
 20
 4^2+3
 $= 19$
 4^4

Contd...

A - 2, प्राविधिक, अधिकृत तृतीय, सहायक निर्देशक (सूचना प्रविधि)

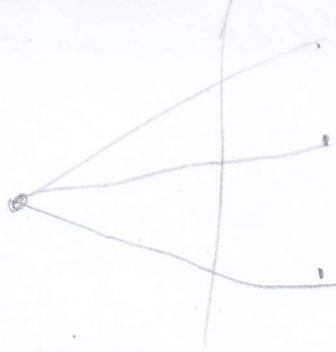
10. The action of parsing the source program into proper syntactic classes is known as analysis.
A) interpretation B) general syntax C) syntax D) lexical
11. Which of the following is a part of compiler that takes as input a stream of characters and produces as output a stream of words along with their associated syntactic categories?
A) Optimizer B) Scanner C) Parser D) None of the above
12. Which of the following is not a primary goal of code optimization in a compiler?
A) Reduce the size of the generated code
B) Improve the readability of the generated code
C) Decrease the execution time of the program
D) Minimize the memory usage of the program
13. Which of the following is not a diagram used in Requirement Analysis?
A) Use Case B) Entity Relationship Diagram
C) State Transition Diagram D) Activity Diagram
14. Coupling is a qualitative indication of the degree to which a module
A) can be written more compactly
B) focuses on just one thing
C) is able to complete its function in a timely manner
D) is connected to other modules and the outside world
15. Which of the following UML diagrams has a static view?
A) Collaboration B) Use case C) State chart D) Activity
16. The ISO quality assurance standard that applies to software engineering is
A) ISO 9000 B) ISO 9001 C) ISO 9002 D) ISO 27000
17. Which of the following is not a type of software maintenance?
A) Predictive B) Corrective C) Adaptive D) Preventive
18. Which of the following is not a phase of prototyping model?
A) Quick design B) Coding
C) Prototype refinement D) Engineer product
19. Which component of XML is used to represent hierarchical data in XML?
A) Elements B) Attributes C) Tags D) Entity Reference
20. What is the primary purpose of data warehousing in information systems?
A) Real-time data processing B) Transaction processing
C) Historical data analysis D) Data encryption
21. Which of the following are under data mining techniques?
A) Association, Array, Classification, Forecasting, Clustering
B) Association, Sequence, Classification, Forecasting, Clustering
C) Association, Index, Classification, Forecasting, Clustering
D) Association, Sort, Classification, Forecasting, Clustering

A - 3, प्राविधिक, अधिकृत तृतीय, सहायक निर्देशक (सूचना प्रविधि)

22. A knowledge intensive computer program that captures the expertise of a human in limited domain of knowledge describes
- A) a virtual reality
B) a neural network
C) a decision support system
D) an expert system
23. How many axis intersects with the projection plane in the three point perspective projection?
- A) One
B) Two
C) Three
D) No axis intersects the projection plane
24. Which scan conversion algorithm is particularly efficient for drawing circles and ellipses?
- A) Bresenham's line algorithm
B) Cohen-Sutherland line clipping algorithm
C) Flood fill algorithm
D) Midpoint circle algorithm
25. Which of the following operations can be used to zoom in or out around any axis on a three-dimensional object from its original position?
- A) Rotation
B) Shearing
C) Scaling
D) Translation

- The End -

उत्तरपुस्तिकामा KEY अनिवार्य रूपमा लेख्नुहोला ।



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प्रतियोगितात्मक लिखित परीक्षा
२०८१।०९।३१

पत्र : द्वितीय
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विषय : Information Technology - II

प्रत्येक Section को उत्तर छुट्टाछुट्टै उत्तरपुस्तिकामा लेख्नुपर्नेछ । अन्यथा उत्तरपुस्तिका रद्द हुनेछ ।

Subjective

Time : 2 hrs 30 mins

75 Marks

Section : "A"

35 Marks

- 29
- ✓ Explain the concept of virtual machines in programming languages. How do they contribute to code executing efficiency? Describe. 2 5
 - ✓ Write a program to implement insertion sort. 1 5
 - ✓ With suitable example, discuss the Depth First Traversal (DFT) and Breadth First Traversal (BFT). 2 5
 - ✓ What is meant by Turing Machines and what are its components? Describe in brief the types/variant of Turing Machines. 2 1+2+2=5
 - ✓ Explain how loop optimizations are different from local optimizations. 1 5
 - ✓ How does the object oriented programming differ from structured programming? With example, explain the multiple inheritance and function overloading in OOP. Also, list the operators which can not be overloaded. 1 + 3 + 3+5+2=10

Section : "B"

40 Marks

- ✓ Describe the concept of prototyping in system analysis and design. Discuss the advantages and disadvantages of using prototyping as a development methodology. 2 5
- ✓ How is Risk-Driven Project Management approach benefited from involvement of Stakeholders? Illustrate. Devise 2 test cases each of Unit Testing and Integration Testing for a User Login System. 2 2+3=5
- ✓ Explain the role of DSS for better performance of any organization. 2 5
- ✓ What is raster scan display? Explain sweep, octree and boundary representations for solid modeling. 1 2+3=5
- ✓ Compare between verification and validation. Also, explain with examples, how the various types of testing help to ensure the quality of a software system. 2+3 4+6=10

10

✓ 12. Describe techniques for validating requirements, such as review, walkthroughs, prototyping and validation testing. Identify the actors and draw a sequence diagram for the following sequence of events: 4+6=10

- The User browses the Product Catalog and selects a product to view its details.
- The Product Catalog retrieves the product information from the Database and displays it to the User.
- The User adds the product to their Shopping Cart.
- The Shopping Cart updates the cart contents and displays the updated total.
- The User proceeds to checkout and confirms the order.
- The Order Processing System processes the order, generates an order ID and updates the order status.

2+3

- The End -