

लोक सेवा आयोग *Sector*
नेपाल राष्ट्र बैंक, प्राविधिक, अधिकृत तृतीय, सहायक निदशक (सूचना प्रविधि) पदको खुला
प्रतियोगितात्मक लिखित परीक्षा
२०८१।०१।३०

पत्र : प्रथम
समय : ३ घण्टा

पूर्णाङ्क : १००

विषय : Information Technology - I

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

Subjective

Time : 2 hrs 30 mins

75 Marks

Section : "A"

40 Marks

1. What is instruction format? Differentiate between RISC and CISC architecture. 2+3=5
2. Explain 4 to 2 priority encoder along with its truth table, logical expression and logic circuit. 5
3. Differentiate between parallel and distributed computing. 5
4. What is referential integrity? Explain how a many to many relationship is converted to relational tables using a suitable example. 1+4=5
5. What is ripple counter? Design a 3-bit asynchronous up counter using T-Flip Flop. Explain J-K Flip Flop with its characteristics equation, characteristics table and logic diagram. 2+4+4=10
6. Explain in detail the 3-tier client-server architecture in DBMS. 10

Section : "B"

35 Marks

7. Make a comparative study between OSI and TCP/IP model. Suggest which one is better. 5
8. Discuss about Classless Inter Domain Routing (CIDR) along with example. 5
9. Explain the process of Remote Procedure Call in distributed system in brief. 5
10. Discuss about message authentication and hash functions. 5
11. Explain the concept of Kerberos authentication and describe the key components involved in the Kerberos protocol. 5
12. Explain briefly the Homogeneous and Heterogeneous Distributed Database Management System. How do you solve middleware in Distributed System? Illustrate taking the case of CORBA. 10

लोक सेवा आयोग

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प्रतियोगितात्मक लिखित परीक्षा

२०८१०९।३०

KEY [B]

पत्र : प्रथम

समय : ३ घण्टा

पूर्णसङ्ख्या : १००

विषय : Information Technology - I

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

Objective

Time : 30 mins

Multiple Choice

25x1=25 Marks

1. The number of inputs in a half adder is
 A) 2 B) 8 C) 11 D) 32
2. The set of tracks that are at one arm position make up a
 A) Sector B) Arm assembly C) Cylinder D) Block
3. Compared to process, a thread has all of the following except
 A) Program counter B) Register set
 C) Access to shared memory space D) Execution stack
4. Distributed pervasive system is also known as
 A) user interface design B) ubiquitous computing
 C) graphical user interface D) peer to peer system
5. Which of the following is generally used for performing tasks like creating the structure of the relations, deleting relation?
 A) DML B) Query C) Relation Schema D) DDL
6. Which file organization technique is comparatively faster to access any arbitrary record?
 A) Ordered file B) Unordered file C) Hashed file D) B-tree
7. Primary index in sequential order file organization is also known as index.
 A) dense B) clustering C) non-clustering D) sparse
8. Which of the following is not a function of the network layers?
 A) Congestion control B) Error control C) Routing D) Inter-networking
9. What is required to use a simple network management system?
 A) IP B) Rules C) Protocols D) Servers
10. The process of verifying the identity of a user is called
 A) Authentication B) Identification C) Validation D) Verification
11. All the resources are tightly coupled in the computing paradigm of computing.
 A) Cloud B) Parallel C) Centralized D) Distributed
12. What serves as the glue between CORBA implementation and the ORB?
 A) Dynamic skeleton interface B) The object adapter
 C) Object middleware D) Wrapper
13. The non-occurrence of improper alteration of information is said to be dependability.
 A) integral B) maintainable C) confidential D) available

Contd...

14. HDFS works in a fashion.
- A) Master-Slave B) Worker-Master C) Slave-Master D) Master-Worker
15. A proxy firewall filters at layer.
- A) Physical B) Data link C) Network D) Application
16. Another name of Merkle-Hellman cryptosystem is
- A) RC4 B) Knapsack C) Rijndael D) Diffie-Hellman
17. The process of dissipating the statistical structure of plaintext over bulk of ciphertext is known as
- A) Diffusion B) Confusion C) Permutation D) Combination
18. Which of the following is not a blockchain component?
- A) Ledger B) Wallet C) Certification Authority D) Hash
19. Cryptographic hash function takes an arbitrary block of data and returns
- A) variable size bit string B) fixed size and variable size bit string
C) constant size byte string D) fixed size bit string
20. Which of the following computer architectures is power efficient?
- A) IANA B) CISC C) ISA D) RISC
21. The circuit used to store one bit of data is
- A) Decoder B) Encoder C) Flip Flop D) Register
22. MOV AX, [BX] represents addressing mode.
- A) register indirect B) direct C) register D) register relative
23. Basic steps of execution of an instruction is
- A) fetch - execute - decode B) decode - fetch - execute
C) execute - fetch - decode D) fetch - decode - execute
24. What is the output of an inverter with respect to less positive input?
- A) Less negative B) Less positive C) More positive D) More negative
25. What happens when both input to RS flip-flop is 1?
- A) Toggles B) Invalid C) Set D) Reset

- The End -

उत्तरपुस्तिकामा KEY अनिवार्य रूपमा लेख्नुहोला ।

लोक सेवा आयोग

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प्रतियोगितात्मक लिखित परीक्षा

२०८१।०१।३१

पत्र : द्वितीय

समय : ३ घण्टा

पूर्णाङ्क : १००

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

1. Explain the concept of virtual machines in programming languages. How do they contribute to code executing efficiency? Describe. 5
2. Write a program to implement insertion sort. 5
3. With suitable example, discuss the Depth First Traversal (DFT) and Breadth First Traversal (BFT). 5
4. What is meant by Turing Machines and what are its components? Describe in brief the types/variant of Turing Machines. 1+2+2=5
5. Explain how loop optimizations are different from local optimizations. 5
6. 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. 3+5+2=10

Section : "B"

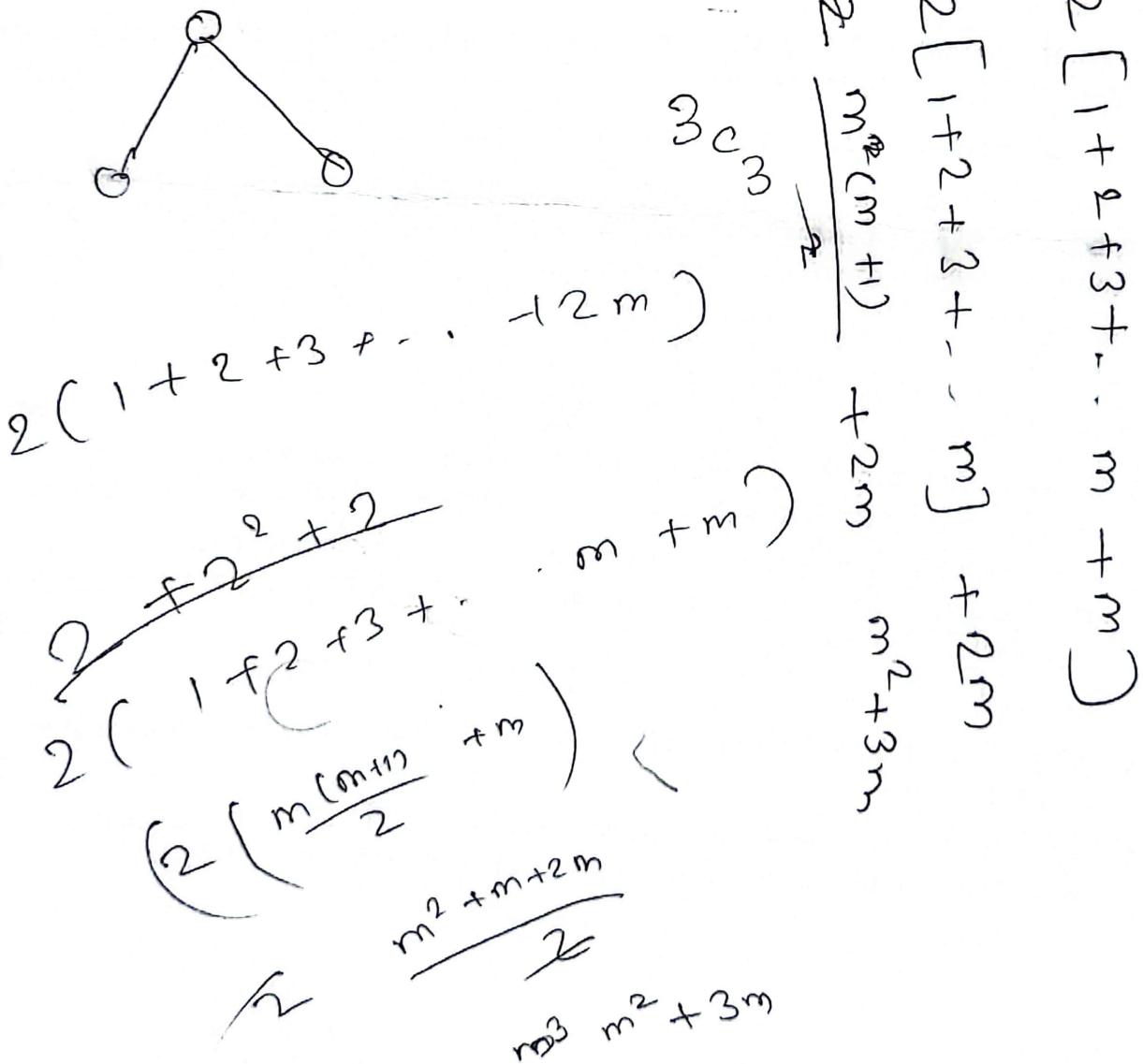
40 Marks

7. Describe the concept of prototyping in system analysis and design. Discuss the advantages and disadvantages of using prototyping as a development methodology. 5
8. 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+3=5
9. Explain the role of DSS for better performance of any organization. 5
10. What is raster scan display? Explain sweep, octree and boundary representations for solid modeling. 2+3=5
11. Compare between verification and validation. Also, explain with examples, how the various types of testing help to ensure the quality of a software system. 4+6=10

2. Describe techniques for validating requirements, such as review, walkthrough, 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.

- The End -



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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) $3m^2+4$

Contd...

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)

1. 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 ।

लोक सेवा आयोग

नेपाल राष्ट्र बैंक, प्राविधिक, अधिकृत तृतीय, सहायक निर्देशक (सूचना प्रविधि) प्रदक्षिण को खुला प्रतियोगितात्मक लिखित परीक्षा

२०८१।०२।०१

KEY [C]

पत्र : तृतीय

समय : ३ पट्टा

पूँजी : १००

विषय : Current Developments In IT Sector and Emerging Technologies

उत्तरपुस्तिकागा प्रश्नपत्रको KEY अग्रिमार्थ रूपले उल्लेख गर्नुपर्नेछ । उल्लेख नगरेगा उत्तरपुरितका एद त्रुनेछ । परीक्षागा calculator, mobile प्रयोग गर्न पाइनेछन् ।

Objective

Time : 30 mins

25x1=25 Marks

Multiple Choice

1. Nepal Rastra Bank is established in AD.
A) 1955 B) 1956 C) 1958 D) 1960
2. Which of the following technologies are commonly implemented by Nepali banks for enhancing customer service and reducing wait time in branches?
A) Artificial Intelligence Chat bots
B) Blockchain for transaction validations
C) Virtual Reality for immersive banking experiences
D) Cloud computing for data storages
3. Whose signature is printed on the paper note in Nepal?
A) Finance Minister B) Governor
C) Deputy Governor D) Prime Minister
4. When is the first Broadband Policy issued by Nepal Government?
A) 2069 BS B) 2070 BS C) 2071 BS D) 2072 BS
5. Bank should check transaction and data integrity site periodically.
A) at Data Center (DC) B) at Disaster Recovery (DR)
C) between DC and DR D) between Head Office and DR site
6. Which widely used JAVA networking terminology refers to a unique identifier assigned to each network interface card (NIC)?
A) IP Address B) Protocol C) Port Number D) MAC Address
7. In the context of Internet programming, what does CGI stand for?
A) Crappy Graphics Interface B) Common Gateway Interface
C) Computer Generated Image D) Calculated Graphical Integration
8. A computer hacker is, in fact, a security expert. Among these hackers, ethical hacker is also known as
A) White hat hacker B) Blue hat hacker C) Grey hat hacker D) Black hat hacker
9. An attempt to harm, damage or cause threat to a system or network is broadly termed as
A) Cyber-crime B) Cyber attack C) System hijacking D) Digital crime

Contd...

10. Which of the following is an essential professional and ethical practice in the field of cyber security?
- A) Regularly updating security patches and software
 - B) Sharing sensitive customer data without consent
 - C) Using unauthorized hacking tools for testing purposes
 - D) Ignoring security incidents and breaches
11. Among the various strategies of risk handling, managing through insurance is one of the following techniques.
- A) Risk avoidance
 - B) Risk reduction
 - C) Risk acceptance
 - D) Risk transfer
12. What term describes the process of analyzing and extracting insights from large and complex datasets?
- A) Data Mining
 - B) Data Warehousing
 - C) Big Data Analytics
 - D) Data Aggregation
13. SWIFT CODE of Nepal Rastra Bank is
- A) NRBL NPKA
 - B) NRB NP
 - C) NRBL
 - D) NRB NPKA
14. Which encryption protocol ensures secure communication between a user's web browser and an E-Commerce website?
- A) Hypertext Transfer Protocol
 - B) Secure Sockets Layer
 - C) File Transfer Protocol
 - D) Simple Mail Transfer Protocol
15. What does 'M-Commerce' stand for in the context of e-commerce?
- A) Multi-Commerce
 - B) Mega-Commerce
 - C) Mobile Commerce
 - D) Marketing Commerce
16. Typically, how many stages are there in E-Government life cycle?
- A) 3
 - B) 4
 - C) 5
 - D) 6
17. Which e-governance model emphasizes citizen participation in decision making processes through online platforms and collaborating tools?
- A) Government-to-Government
 - B) Government-to-Citizen
 - C) Citizen-to-Government
 - D) Government-to-Business
18. What is the e-governance master plan of Nepal?
- A) A framework for implementing e-governance in Nepal
 - B) A case study on the success of e-governance in Nepal
 - C) A policy document outlining the benefits of e-governance in Nepal
 - D) A framework for securing government IT systems in Nepal
19. What is the primary goal of Natural Language Processing (NLP) in the field of AI?
- A) Recognizing patterns in data
 - B) Generating human-like speech
 - C) Understanding and processing human language
 - D) Planning and decision-making
20. algorithm is best suited for a binary classification problem.
- A) Decision Trees
 - B) Random Forest
 - C) KNN
 - D) Linear Regression

- L. Which of the following is not a type of cloud server?
- A) Public Cloud Servers
 - B) Private Cloud Servers
 - C) Dedicated Cloud Servers
 - D) Merged Cloud Servers
12. In cloud computing, transaction overflow processing with reservation system is also known as
- A) Cloud provisioning
 - B) Cloud servicing
 - C) Cloud bursting
 - D) Cloud coalescing
13. Which cloud computing deployment model is characterized by sharing computing resources among multiple organizations or tenants to achieve economies of scale?
- A) Public Cloud
 - B) Private Cloud
 - C) Hybrid Cloud
 - D) Community Cloud
14. In virtual currency taxonomy, what is DAO?
- A) Decentralized Asynchronous Operation
 - B) Digitally Automated Operation
 - C) Decentralized Anonymous Organization
 - D) Decentralized Autonomous Organization
15. What is a primary concern associated with the anonymity of transactions in certain virtual currencies?
- A) Increased transparency
 - B) Enhanced security
 - C) Potential for illegal activities such as money laundering
 - D) Improved regulatory compliance

- The End -

उत्तरपुस्तिकामा KEY अनिवार्य रूपमा लेख्नुहोला ।

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प्रतियोगितात्मक लिखित परीक्षा

२०८१।०२।०९

स्तर : उच्च
समय : ३ घण्टा

पूर्णाङ्क : १००

विषय : Current Developments in IT Sector and Emerging Technologies

प्रत्येक Section को उत्तर छुटाएँ उत्तरप्रस्तिकाना लेजुपर्नेछ । जन्यथा उत्तरप्रस्तिका रद्द हुनेछ ।

Subjective

Time : 2 hrs 30 mins

75 Marks

Section : "A"

35 Marks

1. "Technology is a great enabler, but it also presents pervasive, potentially high-impact risk". Discuss. 5
2. List out the major features of IT Guidelines of NRB. 5
3. What is Common Gateway Interface (CGI) application? Discuss the use of sockets in internet programming. 2+3=5
4. How does cyber crime affect society? Relate with the financial cyber crime and mention the ways to prevent cyber attack. 2+3=5
5. Explain the key technologies of FinTech in brief. 5
6. Analyze the interaction between HTML forms and CGI scripts, outlining the process of sending data from the client to the server using HTML tags. Include practical examples to illustrate the concept. 5+5=10

Section : "B"

40 Marks

7. What are the major opportunities and challenges of E-governance in Nepal? Explain. 5
8. Differentiate between Supervised, Unsupervised and Semisupervised Learning with examples. 5
9. What is cloud computing? What are its basic characteristics? Explain how it can be instrumental for the implementation of Internet of Things (IoT). 1+2+2=5
10. Explain the risks and benefits of virtual currency. 5
11. Describe e-commerce and e-commerce service models. Discuss the importance of cryptography in e-commerce. 2+4+4=10
12. Describe risk. Discuss various approaches to Risk Management. Explain how the technological developments have supported in managing risks in banking sector. 2+4+4=10

- The End -

12/06/2023