JAMMU AND KASHMIR PUBLIC SERVICE COMMISSION

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Subject: Written Examination for the post of Assistant Professor (Information Technology) in Higher Education Department - Provisional Answer Key thereof.

Notification No. PSC/Exam/S/2024/37
Dated: 12.07.2024

In pursuance of Rule 10(c) of the Jammu & Kashmir Public Service Commission (Conduct of Examination) Rules, 2022, as amended upto date, the Provisional Answer Key of Question Paper pertaining to the written examination for the post of **Assistant Professor (Information Technology) in Higher Education Department held on 12.07.2024**, is hereby notified for seeking objections from candidates.

Provisional Answer Key

Assistant Professor (Information Technology)

Test Booklet Question No. (Series A)	
Q1.	B
Q2.	A
Q3.	D
Q4.	D
Q5.	B
Q6.	D
Q7.	C
Q8.	A
Q9.	A
Q10.	B
Q11.	B
Q12.	A
Q13.	D
Q14.	C
Q15.	B

Test Booklet Question No. (Series A)	
Q16.	B
Q17.	C
Q18.	A
Q19.	C
Q20.	D
Q21.	B
Q22.	A
Q23.	A
Q24.	A
Q25.	D
Q26.	C
Q27.	A
Q28.	D
Q29.	B
Q30.	B

Test Booklet Question No. (Series A)	
Q31.	C
Q32.	D
Q33.	A
Q34.	D
Q35.	C
Q36.	B
Q37.	C
Q38.	B
Q39.	B
Q40.	D
Q41.	A
Q42.	C
Q43.	C
Q44.	A
Q45.	A

Test Booklet Question No. (Series A)	
Q46.	B
Q47.	C
Q48.	D
Q49.	C
Q50.	A
Q51.	C
Q52.	C
Q53.	B
Q54.	A
Q55.	A
Q56.	B
Q57.	B
Q58.	A
Q59.	A
Q60.	B
Q61.	A
Q62.	A
Q63.	A
Q64.	D
Q65.	B
Q66.	C
Q67.	D
Q68.	A
Q69.	D
Q70.	A

Test Booklet Question No. (Series A)	
Q71.	D
Q72.	B
Q73.	A
Q74.	B
Q75.	C
Q76.	B
Q77.	B
Q78.	D
Q79.	C
Q80.	A
Q81.	C
Q82.	B
Q83.	D
Q84.	A
Q85.	B
Q86.	C
Q87.	B
Q88.	A
Q89.	B
Q90.	D
Q91.	A
Q92.	C
Q93.	A
Q94.	A
Q95.	B

Test Booklet Question No. (Series A)	
Q96.	A
Q97.	C
Q98.	C
Q99.	C
Q100.	A
Q101.	A
Q102.	A
Q103.	B
Q104.	B
Q105.	B
Q106.	B
Q107.	A
Q108.	D
Q109.	A
Q110.	C
Q111.	D
Q112.	A
Q113.	D
Q114.	A
Q115.	A
Q116.	A
Q117.	A
Q118.	D
Q119.	A
Q120.	D

The candidates are advised to refer to **Question Booklet (Series A)** to match the corresponding question(s) in their respective Question Booklet Series and if any candidate feels that the key to any of the question(s) is/are wrong, he/she may represent on prescribed format/proforma annexed as **Annexure-A** along with the documentary proof/evidence **(hard copies only)** and fee of Rs.500/- per question in the form of Demand Draft drawn in favour of **COE, J&K PSC** (refundable in case of genuine/correct representation) to the Controller of Examinations, Jammu & Kashmir Public Service Commission, from 15.07.2024 to 18.07.2024.**The candidates are further advised to clearly mention the question(s) objected to with reference to its serial number as it appears in the Question Booklet of Series A of the provisional answer key(s).**

Further, any objection/application not accompanied by the requisite Demand Draft of Rs.500/- as prescribed, shall not be considered/entertained under any circumstances. Candidates are, in their own interest, advised to adhere to these instructions and not submit any objection unaccompanied by the Demand Draft as required under extant rules.

The Commission shall not entertain any such representation(s) after the expiry of the stipulated period i.e. **after 18.07.2024 (Thursday), 05.00 pm**.

The provisional answer key(s)are available on the website of the Commission http://www.jkpsc.nic.in.

Sd/-
(Anil Sharma) JKAS
Controller of Examinations
J&K Public Service Commission

No. PSC/Ex-Secy/2024/25 Dated: 12.07.2024

Copy to the: -

1. Director, Information and Public Relations, J&K for publication of the notice in all leading newspapers published from Jammu/Srinagar.
2. P.S. to Hon'ble Chairman, J&K Public Service Commission for information of the Hon'ble Chairman.
3. P.S. to Hon'ble Member, Shri _____ for information of the Hon'ble Member.
4. P. A. to Secretary, J&K Public Service Commission for information of the Secretary.
5. Main file/Stock file/Notice Board.

12/7/24

(Dr. Varnika Raj) JKAS
Under Secretary
J&K Public Service Commission

Annexure-A

Representation regarding objection(s) to any Question/Answer pertaining to the Written Test conducted for the post of Assistant Professor (Information Technology) in Higher Education Department on 12.07.2024

(NOTE: USE SEPARATE FORMS FOR SEPARATE QUESTIONS)

Discipline : Information Technology

Name of the Applicant : _____

Roll No. : _____

Correspondence Address : _____

Contact/Mobile No. : _____

Date of Application: .07.2024

Demand Draft No. date : _____

Candidates Account No.(16 digit) & IFSC Code : _____

_____

Question No. in Series A	Details of the Objection	Resource Material (copy to be enclosed)	Details of the Website (if any)
Correct Answer/Option as per candidate :			

Signature of the Candidate

Note : Application for each question/answer shall be made on separate page in the given format, otherwise the first question entered in the format shall only be considered.

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO

Booklet Serial No. 203565

Test Booklet Series

TEST BOOKLET

A

ASSISTANT PROFESSOR INFORMATION TECHNOLOGY

Written Test - 2024

(53)

Time Allowed: Three Hours *Maximum Marks: 120*

INSTRUCTIONS

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET ***DOES NOT*** HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS, ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. **Please note that it is the candidate's responsibility to encode and fill in the Roll Number and Test Booklet Series Code A, B, C or D carefully and without any omission or discrepancy at the appropriate places in the OMR Answer /Response Sheet. Any omission/discrepancy will render the Response Sheet liable for rejection.**
3. You have to enter your Roll Number on the Test Booklet in the Box provided alongside. ***DO NOT*** **write** ***anything else*** on the Test Booklet.
4. This Test booklet contains **120** items (questions). Each item comprises of four responses (answers). You will select the response which you want to mark on the Answer Sheet/Response Sheet. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose ***ONLY ONE*** response for each item.
5. You have to mark all your responses ***ONLY*** on the separate Answer /Response Sheet provided. *See directions in the Response Sheet.*
6. ***All*** items carry equal marks.
7. Before you proceed to mark in the Answer /Response Sheet, the response to various items in the Test Booklet, you have to fill in some particulars in the Answer /Response Sheet as per instructions sent to you with your Admission Certificate.
8. After you have completed filling in all your responses on the Response Sheet and the examination has concluded, you should hand over to the Invigilator ***only the Answer /Response Sheet***. You are permitted to take away with you the Test Booklet and ***Candidate's Copy of the Response Sheet .***
9. Sheets for rough work are appended in the Test Booklet at the end.
10. While writing Centre, Subject and Roll No. on the top of the Answer Sheet/Response Sheet in appropriate boxes use **"ONLY BALL POINT PEN".**
11. **Penalty for wrong answers:**

    THERE WILL BE PENALTY FOR WRONG ANSWERS MARKED BY THE CANDIDATE IN THE WRITTEN TEST (OBJECTIVE TYPE QUESTIONS PAPERS).

    (i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **(0.25)** of the marks assigned to that question will be deducted as penalty.

    (ii) If a candidate gives more than one answer, it will be treated as a **wrong answer** even if one of the given answers happens to be correct and there will be same penalty as above for that question.

    (iii) If a question is left blank, i.e., no answer is given by the candidate, there will be **no penalty** for that question.

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO

1. In Hexadecimal number system, the Position Value of the digit **B** of the number **A3B9 is**:
   A) 160
   B) 16
   C) 11
   D) 176

2. 2's complement of the binary number 1101100 is:
   A) 0010100
   B) 0010011
   C) 1101111
   D) 1101101

3. In a Graph, a path that starts and ends at the same vertex, without repeating edges or vertices (*except the start & end vertex*) is called a _____:
   A) Trail
   B) Closed walk
   C) Circuit
   D) Cycle

4. Among the graphs described below, which one is definitely a graph?
   A) G has 10 vertices and 11 edges
   B) G has 10 vertices and 9 edges
   C) G is connected and every vertex has degree 1 or 2
   D) There is exactly one path between any two vertices of G

5. In *a semi-group*, which two properties are essential?
   A) Closure and Inverse
   B) Closure and Associative
   C) Identity and Inverse
   D) Associative and Identity

6. Which one of the following statements is false?
   A) Homomorphism is a map from one group to another that preserves the group operation.
   B) Isomorphism between two groups we mean a one-to-one correspondence between them which transforms one of the groups into the other.
   C) An isomorphism from a group G onto itself is called an automorphism of G.
   D) To show that two groups are isomorphic, it is enough to show that one group has some structural property, which the other group does not possess.

7. Which of the following steps is mandatory in the principle of mathematical induction?

A) Minimal set representation

B) Inductive reference

C) Inductive hypothesis

D) Recurrence relation

8. Anita comes to you with a game. She flips a coin and you roll a die. If she gets heads and you roll an even number, you win Rs. 200; if she gets heads and you roll an odd number, you pay her Rs. 300. If she gets tails and you roll either 1 or 4, you win Rs. 500; if she gets tails and any of 2, 3, 5, or 6 is rolled, you pay her Rs. 200.

a) What is the probability you win Rs. 500?

b) What is the probability you win any amount of money?

A) a) 1/6 ; b) 5/12

B) a) 1/4 ; b) 1/12

C) a) 1/6 ; b) 4/12

D) a) 1/3 ; b) 5/12

9. Let $R=Z[\sqrt{-5}]$ be the ring consisting of all numbers of the form $a+b\sqrt{-5}$, where a and b are integers. Which of the following statements is true?

A) R is an integral domain because it has no zero divisors.

B) R is not an integral domain because it does contain zero divisors.

C) R is an integral domain because every non-zero element has a multiplicative inverse.

D) R is not an integral because the distributive property fails.

10. An engineering company advertises a job in three newspapers X, Y and Z. It is known that these papers attract graduate engineering readerships in the proportion 2:3:1. The probabilities that an engineering graduate sees and replies to the job advertisement in these papers are 0.002, 0.001 and 0.005 respectively. Assume that the graduate sees only one job advertisement.

If the company receives two replies, what is the probability that both applicants saw the job advertised in newspaper X?

A) 1/12

B) 1/9

C) 1/16

D) 1/25

11. In a version of the computer language BASIC, the name of a variable is a string of one or two alphanumeric characters (A to Z; and 0 to 9 only), where uppercase and lowercase letters are not distinguished. Moreover, a variable name must begin with a letter and must be different from the six strings of two characters that are reserved for programming use. How many different variable names are there in this version of BASIC?
    A) 930
    B) 956
    C) 1184
    D) 1290

12. Which one of these relations on {0, 1, 2, 3} are equivalence relations?
    A) {(0, 0), (1, 1), (1, 2), (2, 1), (2, 2), (3, 3)}
    B) {(0, 0), (1, 1), (1, 3), (2, 2), (2, 3), (3, 1), (3, 2), (3, 3)}
    C) {(0, 0), (0, 2), (2,0), (2, 2), (2, 3), (3, 2), (3, 3)}
    D) {(0, 0), (0, 1), (0, 2), (1, 0), (1, 1), (1, 2), (2, 0), (2,2), (3, 3)}

13. Identify the option that is **NOT** an analytic evaluation method for scheduling algorithm.
    A) Deterministic Model.
    B) Simulation.
    C) Queueing model.
    D) Semaphore.

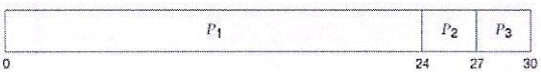
14. Identify the system call that is **DOES NOT** belong to "Information maintenance".
    A) get/set time
    B) get/set system data
    C) get/set file permissions
    D) get/set process, file attribute

15. "A set $\{T_0, T_1, \ldots\ldots T_n\}$ of waiting threads must exist such that T_0 is waiting for a resource held by T_1, T_1 is waiting for a resource held by T_2, ..., T_{n-1} is waiting for a resource held by T_n, and T_n is waiting for a resource held by T_0". Which option is this necessary condition for deadlock.
    A) Hold and wait
    B) Circular wait
    C) No pres - emption
    D) Mutual exclusion

16. Two types of latencies affect the performance of real-time systems-
    A) Interrupt, Operational
    B) Interrupt, Dispatch
    C) Dispatch, OS
    D) Operational, OS

17. For three processes, the scheduling is also shown. This is _____ type of scheduling

Process	**Burst time**
P_1	24
P_2	3
P_3	3



A) SJF

B) SRJF

C) FCFS

D) Round Robin

18. UNIX/LINUX OS uses ELF format for the object file which is the acronym of

A) Executable and Linkable Format

B) Extended Linking Format

C) Extended Loadable Format

D) Elegant Linking Format

19. Identify the option that is **FALSE** for demand paging.

A) Commonly used in virtual memory systems.

B) Pages are loaded only when they are demanded during program execution.

C) A demand-paging system is similar to a paging system without swapping

D) Pages that are never accessed are thus never loaded into physical memory.

20. The executable code, global variables, memory that is dynamically allocated during program runtime, and temporary data storage when invoking functions is stored in____, _____, _____, _____ sections respectively, in a memory layout of a process.

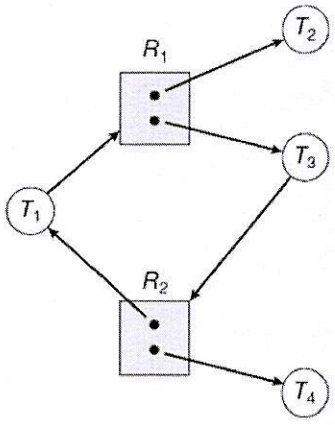
A) Stack, Data, Heap, Text

B) Text, Stack, Heap, Data

C) Text, Heap, Stack, Data

D) Text, Data, Heap, Stack

21. Identify the **CORRECT** statement for the graph.



A) Deadlock because there is a cycle

B) No deadlock because T_4 can release R_2

C) No deadlock because there is no cycle

D) None of the above

22. On a 32-bit CPU, each page-table entry is 4 bytes long. A 32-bit entry can point to one of 2^{32} physical page frames. If the frame size is 4 KB (2^{12}), then a system with 4-byte entries can address _____ of physical memory.

A) 16TB

B) 8TB

C) 32TB

D) 4TB

23. Select the option that shows the steps of System boot process, in order -

(i) Kernel initializes hardware.

(ii) The root file system is mounted

(iii) Kernel is loaded into memory.

(iv) Bootstrap program locates the Kernel.

A) (iv)(iii)(i)(ii)

B) (iv)(i)(ii)(iii)

C) (iv)(ii)(iii)(i)

D) (iv)(ii)(i)(iii)

24. Match the following.

(i)	Semaphore	(a)	Hardware-based solution
(ii)	Mutex Lock	(b)	Entry-exit section
(iii)	Peterson Solution	(c)	Software-based solution
(iv)	Critical Section	(d)	wait() and signal()

A) (i)-(d), (ii)-(a), (iii)-(c), (iv)-(b)

B) (i)-(b), (ii)-(a), (iii)-(c), (iv)-(d)

C) (i)-(b), (ii)-(c), (iii)-(d), (iv)-(a)

D) (i)-(b), (ii)-(d), (iii)-(c), (iv)-(a)

25. The _____ files can be used to drive simulation.

A) Error.

B) Output.

C) Testing.

D) Trace.

26. An algorithm that uses the past result to find the new result is _____.

A) Divide and conquer

B) Brute Force

C) Dynamic Programming

D) None of the Above

27. What is a KPI in the context of Business Intelligence?

A) Key Performance Indicator

B) Knowledge Processing Interface

C) Knowledge Performance Index

D) Key Processing Indicator

28. Which problem cannot be solved by backtracking method?

A) n-queen problem

B) Subset sum problem

C) Hamiltonian circuit problem

D) Travelling salesman problem

29. The height of AVL tree with n nodes is _____.

An n-element AVL search tree can be searched in O(height) =_____ time.

A new element can be inserted into n-element AVL tree in time _____.

An element can be deleted from an n-element AVL tree in time _____.

A) O(log n), O(log n), O(n), O(n).

B) O(log n), O(log n), O(log n), O(log n).

C) O(log n), O(n), O(n), O(log n).

D) O(log n), O(log n), O(n), O(log n).

30. Sort all the functions below in increasing order of asymptotic (big-O) growth. $(n/4)^{n/4}\ 4^{n^4}\ 5^{5^n}\ n^{n/4} 4^{4^n}$.

A) $(n/4)^{n/4} < 4^{n^4} < 4^{4^n} < n^{n/4} < 5^{5^n}$

B) $(n/4)^{n/4} < n^{n/4} < 4^{n^4} < 4^{4^n} < 5^{5^n}$

C) $(n/4)^{n/4} < 4^{n^4} < 4^{4^n} < n^{n/4} < 5^{n^5}$

D) $(n/4)^{n/4} < 4^{4^n} < n^{n/4} < 4^{n^4} < 4^{4^n} < 5^{5^n}$

31. Bellmann Ford Algorithm is an example for _____

A) Linear Programming

B) Greedy Algorithms

C) Dynamic Programming

D) Branch and Bound

32. Identify the problem that is **NOT** NP-complete.

A) Determining whether a 3-CNF formula is satisfiable.

B) Determining whether a graph contains a simple path with at least a given number of edges.

C) Determining whether a directed graph has a hamiltonian cycle.

D) The circuit-satisfiability problem.

33. Let T be a complete binary tree with n nodes. Finding a path from the root of T to a given vertex v € T using breadth-first search takes _____ time.

A) $\Omega(n)$

B) $O(1g\ n)$

C) $O(n^2)$

D) $\Omega(1g\ n)$

34. Identify the **INCORRECT** option.

A) Worst case time complexity of Quicksort and Insertion sort is $O(n^2)$

B) Worst case time complexity of Mergesort is O(nlg n)

C) Worst case time complexity of Selection sort is $O(n^2)$

D) Worst case time complexity of Heapsort is $O(n^2)$

35. The four items- A, B, C, and D are pushed in a stack, starting from A, one after other. The stack is popped three items and each element is inserted in a queue. The two elements are deleted from the queue and pushed back on the stack. One item is popped from the stack. The popped item is

A) A

B) B

C) C

D) D

36. The following numbers are inserted into an empty binary search tree in the given order: 11, 1, 4, 8, 18, 17, 19. What is the height of the binary search tree?

A) 2

B) 3

C) 4

D) 5

37. The solution to the recurrence T(n) = 3T(n/3) + O(lg n) is _____.

A) $T(n) = \theta(n \lg n)$

B) T(n)= O(nlg n)

C) T(n) = O(n)

D) T(n)= O(lg n)

38. Identify the statements that are **TRUE**.

1. Depth-first search will take $\Theta(V_2)$ time on a graph G = (V;E) represented as an adjacency matrix.
2. Given an adjacency-list representation of a directed graph G=(V;E), it takes O(V) time to compute the in-degree of every vertex.

A) True, True.

B) True, False.

C) False, True.

D) False, False.

39. The DBMS must be able to handle requests to retrieve, update, or delete existing data in the database or to add new data to the database. This is done using the:

A) DDL processor.

B) DML processor.

C) Transaction manager.

D) Run-time manager.

40. Assume a schema of : *Emp (Id, Name, DeptId), Dept (Id, Name)*

If there are 10 records in the Emp table and 5 records in the Dept table, how many rows will be displayed in the result of the following SQL query:

Select * From Emp, Dept

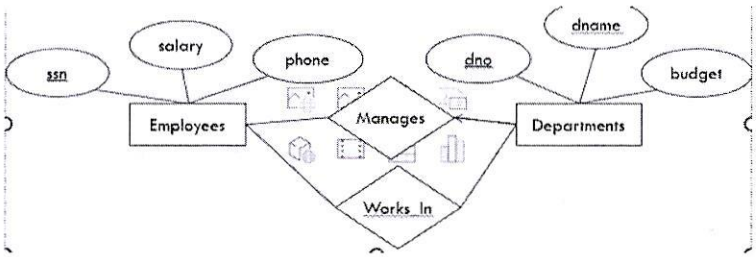
A) 5

B) 10

C) 15

D) 50

41. Identify the **CORRECT** translation of the ER diagram into SQL statement.



CREATE TABLE Works_in(

ssn CHAR(10),

dno INTEGER,

PRIMARY KEY _____

FOREIGN KEY _____

REFERENCES Employees,

FOREIGN KEY _____

REFERENCES Departments)

A) (ssn, dno), (ssn), (dno)

B) (ssn), (ssn), (dno)

C) (dno), (ssn), (dno)

D) (ssn, dno), (dno), (ssn)

42. We have two tables - one called **students**, and one called **advisors**. The students table contains a field called **advisor_id** that references an id within the advisors table. Not all **students** have an **advisor**, and not all advisors are assigned to students. If we wanted to pull information on students and their advisors, *excluding* students who are not assigned to an advisor, we would use:

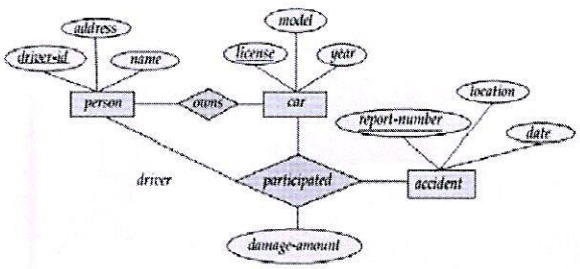
A) Cross Join

B) Full Join

C) Inner Join

D) Left Join

43. Design a relational database schems for the following E-R diagram.



A) Person(driver-id, name, address) car(license, year, model) accident(report-number, location, date) owns(driver-id, license) participated(report-number, driver-id, license).

B) Person(driver-id, name, address) car(license, year, model) accident(report-number, date) owns(driver-id, license) participated(report-number, driver-id, license, damage-amount).

C) Person(driver-id, name, address) car(license, year, model) accident(report-number, location, date) owns(driver-id, license) participated(report-number, driver-id, license, damage-amount).

D) Person(driver-id, name, address) car(license, year, model) accident(report-number, location, date) owns(driver-id, license) participated(report-number, damage-amount).

44. All RDBMS transactions obey the basic properties of a database transaction. What is the name of the following property?

"All tasks of a transaction are performed or none of them are. There are no partial transactions."

A) Atomicity

B) Consistency

C) Durability

D) Isolation

45. What is supported by warehouses?

A) OLAP

B) OLTP

C) OLAP and OLTP

D) Operational databases

46. Let R_1(P, Q, R, S) be a relational schema. And F = (P -> QR, PQ -> S, Q-> R) be a set of functional dependencies defined over R_1. What is the closure of the attribute set {Q}.

A) (P,R,S)

B) (Q,R)

C) (P,Q,R)

D) (Q)

47. In a DBMS, the relationship between a weak entity-set is called as the _____.

A) Associative relationship

B) Connecting relationship

C) Identifying relationship

D) Weak relationship

48. In a three-tier data warehouse architecture, where raw data from different sources is initially loaded and stored before further processing is called _____.

A) Data warehouse storage

B) ETL area

C) OLAP

D) Staging area

49. Which of the following are the different OLAP operations performed in the multidimensional data model?

a) Roll-up

b) Roll-down

c) Drill-down

d) Slice

A) a,b and c only

B) b,c and d only.

C) a,c and d only.

D) a,b,c and d.

50. Identify the statement that has an error.

A) Select empid where empid = 1009 and lastname = 'Gita';

B) Select * from emp where empid = 10003;

C) Select empid from emp where empid = 10006

D) Select empid from emp;

51. Identify the option that is **NOT** a type of Black-box testing.

A) Boundary value Analysis

B) Equivalence Class testing

C) Path testing

D) Decision Table Based Testing

52. FAST is a team-oriented approach for gathering requirements. FAST stands for-

A) Functional Application Specification Technique

B) Fast Application Specification Technique

C) Facilitated Application Specification Technique

D) None of the above

53. Identify the option that is **NOT** an agile method.

A) Scrum.

B) Iterative and Incremental.

C) Crystal.

D) Feature Driven Development.

54. The Risk Exposure is calculated as - RE = P * C

The P and C stand for-

A) P - Probability of occurrence for a risk
C - Cost to project if risk occurs

B) P - Percentage of occurrence for a risk
C - Chance of occurrence of risk

C) P - Projection of risk occurrence
C - Catastrophe impact if risk occurs

D) P - Potential of occurrence for a risk
C - Critical impact if risk occurs

55. _____ is an indication of the relative _____strength of a module. _____is an indication of the relative _____among modules.

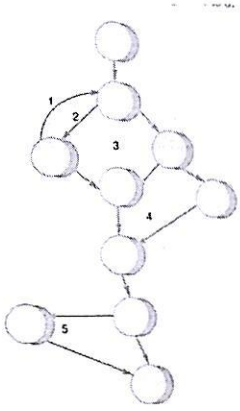
A) Cohesion, functional, coupling, interdependence

B) Coupling, functional, cohesion, interdependence

C) Cohesion, interdependence, coupling, functional

D) Coupling, interdependence, cohesion, functional

56. What is the cyclomatic complexity of the following graph



A) 4

B) 5

C) 6

D) 7

57. The process that performs the following task is called _____.

"Data processed by the program is changed to reflect program changes, like, redefining database schema, converting existing databases"

A) Data Translation.

B) Data Reengineering.

C) Data Structure.

D) Data Cleaning.

58. An organization produces 350 LOC/PM with labour rate of Rs. 7000/PM. Estimate the effort in PM and the cost in Rupees. Required to build the software having 70,000 LOC

A) 200 PM, Rs. 14,00,000/-

B) 220 PM, Rs. 16,00,000/-

C) 250 PM, Rs. 10,00,000/-

D) 210 PM, Rs. 15,00,000/-

59. Match the users with the requirement documents

(i)	Baseline	(a)	A set of versions of a software component and other configuration items on which that component depends.
(ii)	Version	(b)	A collection of component versions that make up a system. They are controlled.
(iii)	Codeline	(c)	An instance of a configuration item that differs, in some way, from other instances of that item.
(iv)	Configuration Control	(d)	Ensuring that versions of systems and components are recorded and maintained so that all versions of components are identified and stored for lifetime of the system.

A) (i)-(b), (ii)-(c), (iii)-(a), (iv)-(d)
B) (i)-(b), (ii)-(a), (iii)-(c), (iv)-(d)
C) (i)-(b), (ii)-(c), (iii)-(d), (iv)-(a)
D) (i)-(b), (ii)-(d), (iii)-(c), (iv)-(a)

60. Identify the statements that are **TRUE** for the waterfall model

(i) A systematic sequential approach to software development.
(ii) Developed through a series of fixed length mini projects called iterations.
(iii) After every cycle a useable product is given to the customer.
(iv) Expects complete and accurate requirements early in the process

A) (i) (ii)
B) (i) (iv)
C) (ii) (iii)
D) (iii) (iv)

61. An application has the following:

10 low external inputs, 12 high external outputs, 20 low internal logical files, 15 high external interface files, 12 average external inquiries, The weight factors are-

Functional Units	Weighting factors		
	Low	Average	High
External Inputs (EI)	3	4	6
External Output (EO)	4	5	7
External Inquiries (EQ)	3	4	6
External logical files (ILF)	7	10	15
External Interface files (EIF)	5	7	10

What is the unadjusted Function Point count for above application?

A) 452
B) 552
C) 652
D) 352

62. Match the ISO 9126 quality factor to its definition.

(i)	Functionality	(a)	The ease with which repair may be made to the software
(ii)	Reliability	(b)	The degree to which the software satisfies stated needs
(iii)	Usability	(c)	The degree to which the software is easy to use
(iv)	Maintainability	(d)	The amount of time that the software is available for use

A) (i)-(b), (ii) - (d), (iii) - (c), (iv) - (a)

B) (i)-(b), (ii) - (c), (iii) - (d), (iv) - (a)

C) (i)-(c), (ii) - (d), (iii) - (a), (iv) - (b)

D) (i)-(c), (ii) - (b), (iii) - (d), (iv) - (a)

63. In Boundary Value Analysis, test cases for a program with two input variables having values in the range 100-300 are-

A) (200,100), (200, 101), (200, 200), (200, 299), (200, 300), (100, 200), (101, 200), (299, 200), (300, 200)

B) (300,100), (300, 101), (200, 200), (100, 299), (100, 300), (100, 200), (101, 299), (299, 100), (300, 100)

C) (200,300), (200, 100), (100, 300), (100, 299), (100, 300), (101, 200), (101, 299), (299, 101), (300, 200)

D) (200,100), (300, 101), (300, 200), (100, 299), (200, 300), (100, 300), (101, 300), (299, 200), (100, 200)

64. Identify the option that is **NOT** a WAN technology.

A) Frame Relay

B) X.25

C) ATM

D) Token Ring

65. FDMA is an access method in the _____.

A) Network Layer

B) Data Link Layer

C) Transport Layer

D) Physical Layer

66. Which of the following statement are **TRUE** for the Locality of reference principle-

(i) Computers are more likely to communicate with computers that are physically nearby

(ii) A computer is more likely to communicate with same set of computers repeatedly.

A) only (i).

B) only (ii)

C) Both (i) and (ii)

D) None of (i) or (ii)

67. Identify the statement that is **FALSE** about Virtual Private Network.

A) A private datagram, including the header, is encapsulated in an ESP packet.

B) The router at border of the sending site uses its own IP address and address of router at destination site in the new datagram.

C) Internet is responsible for carrying the packet from R_1 to R_2.

D) Outsiders can decipher contents of the packet.

68. IP is a connectionless protocol that provides no flow control, no error control, and no congestion control services.

A) Connectionless, flow, error, congestion

B) Connectionless, pipe, message, congestion

C) Connection, file, error, congestion

D) Connection, pipe, message, congestion

69. Identify the statements that are **TRUE** for "At the transport layer, the error control is responsible for" -

i. Detecting and discarding corrupted packets.

ii. Keeping track of lost and discarded packets and resending them.

iii. Recognizing duplicate packets and discarding them.

iv. Buffering out-of-order packets until the missing packets arrive.

A) Only (i)(ii)

B) Only (i) (ii) (iii)

C) Only(iii)

D) All (i)(ii)(iii)(iv)

70. A network using CSMA/CD has a bandwidth of 10 Mbps. If the maximum propagation time is 25.6 μ s, what is the minimum size of the frame?

A) 512 bits

B) 1024 bits

C) 256 bits

D) 2048 bits

71. A classless address is given as 167.199.170.82/27. Find-

(i) Number of addresses in block

(ii) First address

(iii) Last address

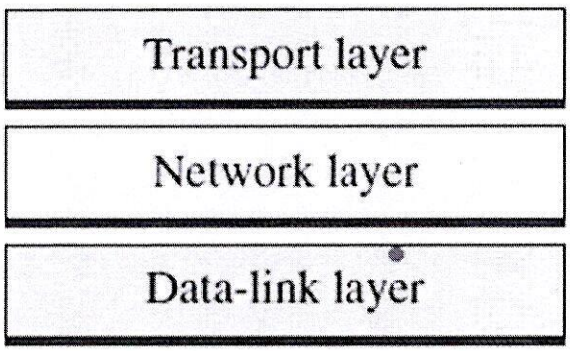
A) 27, 10100111 11000111 10101010 01011111, 10100111 11000111 10101010 01000000

B) 32, 10100111 11000111 10101010 01011111, 10100111 11000111 10101010 01000000

C) 27, 10100111 11000111 10101010 01000000, 10100111 11000111 10101010 01011111

D) 32, 10100111 11000111 10101010 01000000, 10100111 11000111 10101010 01011111

72. Match the packet name and address for the layers from bottom to top



A) (Frame, User datagram, Datagram) (Link layer address, port number, logical address).

B) (Frame, Datagram, User datagram) (Link layer address, logical address, port number).

C) (User datagram, Frame, Datagram) (Port number, Link layer address, logical address).

D) (Datagram, Frame, User datagram) (Logical address, Link layer address, port number).

73. Use the additive cipher with key = 15 to encrypt the message "hello".

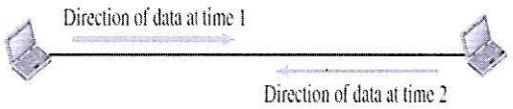
A) WTAAD

B) WSBBE

C) VSAAD

D) VSBBE

74. The communication shown in the diagram is an example of -



A) Simplex mode
B) Half-duplex mode
C) Full-duplex mode
D) Double-duplex mode

75. Electromagnetic waves having frequencies between ____ and ____ GHz are called microwaves.
A) 200, 2000
B) 1,3000
C) 1,300
D) 20,2000

76. Multiplexing is of three types - Frequency division, Wavelength-division, Time-division. They are designed for _____, _____ and _____ signals.
A) Analog, Digital, Analog
B) Analog, Analog, Digital
C) Digital, Analog, Analog,
D) Analog, Analog, Analog

77. The _____ layer houses the business logic and is used to process user inputs.
A) Presentation Layer
B) Application Layer
C) Database Layer
D) Session Layer

78. Identify the option that is FALSE for SMTP, POP3 and IMAP.
A) POP_3 is an application-based e-mail to access mail from the server.
B) The client connects to the server for SMTP on port 25.
C) The client connects to the server for POP3 on port 110
D) The client connects to the server for IMAP on port 14.

79. Identify the correct statements.
Statement 1: In a thin-client mode, presentation layer is implemented on the client and all other layers are implemented on a server.
Statement 2: In a fat-client model, some or all of the application processing is carried out on the client. Data management and database functions are implemented on the server.
A) Only Statement (1)
B) Only Statement (2)
C) Both Statements (1) and (2)
D) None of the above

80. A Multiple-tier ODBC driver processes ODBC _____ and passes _____ statements to the _____source.

A) Calls, SQL, data

B) Data, SQL, Call

C) Calls, data, SQL

D) SQL, data, calls

81. Identify the option that is **NOT** a baseband modulation.

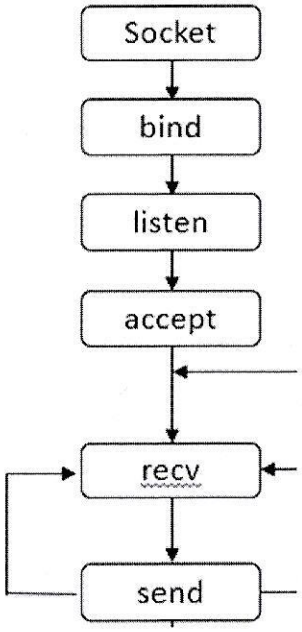
A) NRZ

B) NRZI

C) Polar

D) Manchester

82. This chart is for-



A) Client

B) Server

C) Application Layer

D) Presentation Layer

83. Given the URL- http://www.dsc.com/mainpage

The (i) protocol, (ii) address and (iii) path is-

A) (i) http://www (ii)dsc.com (iii) mainpage

B) (i) http://www (ii) dsc.com/main (iii) page

C) (i) http (ii) dsc.com, (iii) www.mainpage

D) (i) http (ii) www.dsc.com (iii) mainpage

84. Match the following

(i)	Rich transaction Processing	(a)	Houdini-sized illusion
(ii)	Roaming Agents	(b)	Nested transactions that can span across multiple servers
(iii)	Rich Data Management	(c)	OLE or Open Doc
(iv)	Intelligent Middleware	(d)	Agent technology

A) (i)-(b), (ii) - (d), (iii) - (c), (iv) - (a)

B) (i)-(b), (ii) - (c), (iii) - (d), (iv) - (a)

C) (i)-(c), (ii) - (d), (iii) - (a), (iv) - (b)

D) (i)-(c), (ii) - (b), (iii) - (d), (iv) - (a)

85. The database server logic deals with-

A) What-if analysis

B) Data security

C) Domain validation

D) Data dependency validation

86. An example of composite data type is-

A) Boolean

B) Character

C) Array

D) Integer

87. A variant record in C is written using-

A) Struct.

B) Union.

C) Set

D) Array.

88. Identify the following phases for the creation of bindings of names to objects

i.	Design of language	a.	Memory space allocation for static processing
ii.	Program Writing	b.	Binding for pointer variables whose memory is allocated dynamically
iii.	Compile Time	c.	Bindings between primitive constants, types and operations of language
iv.	Runtime	d.	Binding of an identifier to a variable

A) (i)-(c), (ii) - (d), (iii) - (a), (iv) - (b)
B) (i)-(b), (ii) - (c), (iii) - (d), (iv) - (a)
C) (i)-(c), (ii) - (d), (iii) - (b), (iv) - (a)
D) (i)-(c), (ii) - (b), (iii) - (d), (iv) - (a)

89. Shadowing redefines a field in the subclass. Identify the shadowing in the code

```
class EvenNewCounter extending NewCounter{
   private int num_reset = 2;
   public void reset(){
      x = 0;
      num_reset = num_reset + 2;
   }
   public int howmany_resets(){
      return num_reset;
   }
}
```

A) x
B) num_reset.
C) New Counter.
D) How many_resets

90. What is the output of the following code-

```
void swap (int *a, int *b) {
     int tmp = *a; *a=*b; *b=tmp;
}
int main() {
int v1 = 10;
int v2 = 20;
swap(&v1, &v2);
printf("v1=  %d\n", v1 );
printf("v2=  %d\n", v2 );
return 0;
}
```

A) 10,20
B) 10,10
C) 20,20
D) 20,10

91. In object-oriented language, the storage is allocated to the dynamic objects, commonly, on the ___ memory.

A) Heap
B) Stack
C) Data
D) Counter

92. Fill in the blanks.

i. _____ has to do with the possibility of using an object in another context.
ii. _____ has to do with the possibility of reusing the code which manipulates an object.
iii. _____ is a relation between the implementations of two classes.
iv. _____ is a relation between the interfaces of two classes.

A) Inheritance Inheritance, Subtype, Subtype
B) Inheritance Subtype, Inheritance, Subtype
C) Subtype, Inheritance. Inheritance, Subtype
D) Subtype Subtype, Inheritance Inheritance

93. In C, after execution of the following code, the object pointed to by pointers p and r will have values ---

```
float r = 3.1415;
float* q;
q = &r;
*p = 33;
r = *q + 1;
```

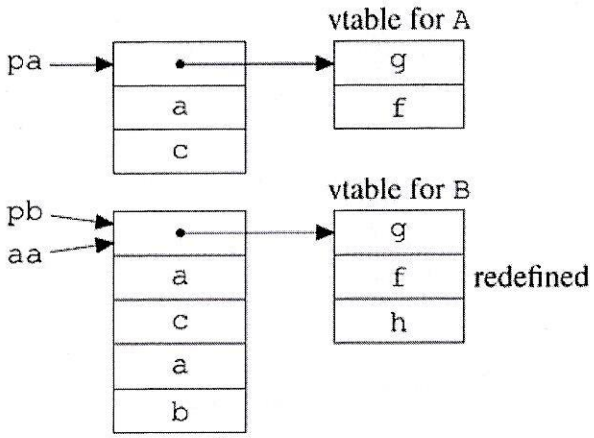
A) 33, 4.1415
B) 34, 3.1415
C) 33, 3.1415
D) 34, 4.1415

94. If we execute the following Java code, what will be the output?

```
String s1= new String("Good Morning! ");
String s2 = "Good Morning! ";
String s3 = "Good Morning! ";
String s4= new String("Good Morning! ");
System.out.println(s1 == s2);
System.out.println(s1 == s3);
System.out.println(s2 == s3);
System.out.println(s1 == s4);
```

A) false, false, true, false
B) false, false, false, false
C) true, true, false, true
D) true, true, true, true

95. The code in C++ for the following representation is-



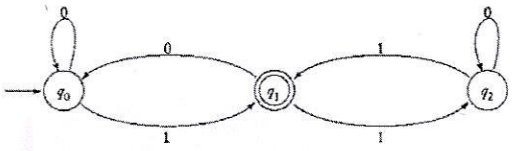
A)
```
#include <iostream>
    class A{int a; char c;
        void g() {};
        public: void f() {} };
    class B: public A{
        int a; int b;
        void h() {};
        };
    int main() {
        B pb; A pa; A aa ;
    Aa := pb; aa.f();
        return 0; }
```

B)
```
#include <iostream>
    class A{int a; char c;
        void g() {};
        public: void f() {} };
    class B: public A{
        int a; int b;
        void h() {};
        void f() {} };
    int main() {
        B pb; A pa; A aa ;
        aa = pb; aa.f();
        return 0; }
```

C)
```
#include <iostream>
    class A{int a; char c;
        void g() {};
     void f() {} };
    class B: public A{
        int a;  int b;
        void h() {};
        void f() {} };
    int main() {
        B pb; A pa; A aa ;
        Aa: = pb; aa.f();
        return 0; }
```

D)
```
#include <iostream>
    class A{int a;  char c;
        void g() {};
     void f() {} };
    class B: public A{
        int a;  int b;
        void h() {};
        void f() {} };
    int main() {
        B pb;  B pa; A aa ;
        aa = pb; aa.f();
        return 0; }
```

96. The dfa represented by the following graph (assume ð as it is) is-



A) $M = (\{q_0, q_1, q_2\}, \{0, 1\}, ð, q_0, \{q_1\})$

B) $M = (\{q_0, q_1\}, \{0, 1\}, ð, q_1, \{q_2\})$

C) $M = (\{q_0, q_1\}, \{0, 1\}, ð, q_0, \{q_2\})$

D) $M = (\{q_0, q_1, q_2\}, \{0, 1\}, ð, q_0, \{q_2\})$

97. Error recovery in a top-down parser makes use of a set of tokens called _____.

A) Predictive token

B) Production token

C) Synchronization token

D) Push token

98. Which of the following statement are **TRUE** for the standard Turing machine-

i. Has a tape that is unbounded in both directions, allowing any number of left and right moves.

ii. It is non-deterministic in the sense that ð defines at most one move for each configuration.

iii. There is no special input file.

A) Only (i), (ii)

B) Only (ii), (iii)

C) Only (i), (iii)

D) All (i), (ii), (iii)

99. Identify the **INCORRECT** statement about- "LR(1) is the set of grammars" .

A) It is parsed via shift-reduce techniques with a single token of lookahead

B) It is a super-set of LL(1)

C) It can accommodate left recursion and common left prefixes which are also permitted in LL(1).

D) It enables us to express many programming constructs in a more natural way.

100. To pass a nested routine as a parameter, pass the _____.

A) Two-pointer descriptor
B) Three-pointer descriptor
C) Four-pointer descriptor
D) One-pointer descriptor

101. A language L on __ is said to be recursive if there exists a Turing machine __ that accepts ___ and that halts on every ___in ϵ^+.

A) ϵ, M, L, *w*
B) ϵ, L, *w*, M
C) ϵ, M, *w*, L
D) ϵ, L, M, *w*

102. A deterministic finite acceptor or dfa is defined as - M : (Q , ϵ , ð, , q_0, F) Where, the symbols mean-

A) Q - Internal state, ϵ - Input Alphabet, ð - Transition Function, q_0 - Initial state, F - Final state
B) Q - Initial state, ϵ - Transition Function, ð - Input Alphabet, q_0 -Internal state, F - Final state
C) Q - Internal state, ϵ - Transition Function, ð - Input Alphabet , q_0 - Initial state, F - Final state
D) Q - Input Alphabet, ϵ - Internal state, ð - Transition Function, q_0 - Final state, F - Initial state

103. The scope of local, global and intraprocedural optimization, respectively are-

A) Relationships between different functions, Control-flow-graph, Single basic block.
B) Single basic block, Control-flow-graph, Relationships between different functions.
C) Relationships between different functions, Single basic block, Control-flow-graph.
D) Single basic block, Relationships between different functions, Control-flow-graph.

104. Which of the following statement are **TRUE** for the normal forms-

i. Chomsky normal form puts restriction on the number of symbols on left of the production.
ii. Greibach normal form puts restriction on the positions in which the terminals and variables can appear.

A) Only (i)
B) Only (ii)
C) Both (i) and (ii)
D) None of (i) and (ii)

105. What does STRIPS stand for in the context of AI planning system?

A) Simple Temporal Reasoning in Planning Systems
B) Stanford Research Institute Problem Solver
C) Structured Representation of Intelligent Planning Systems
D) Sequential Temporal Reasoning and Planning System.

106. Identify the **INCORRECT** statement

A) S-attributed grammars, are characterized by having no inherited attributes at all.

B) L-attributed grammars cannot be incorporated conveniently in top-down parsing.

C) L-attributed grammars are attribute grammars which allow the attributes to be evaluated in one left-to-right traversal of the syntax tree.

D) L-attributed grammar is characterized by the fact that no dependency graph of any of its production rules has a data-flow arrow that points from a child to that child or to a child to the left of it.

107. Which ones are the three main issues in code generation.

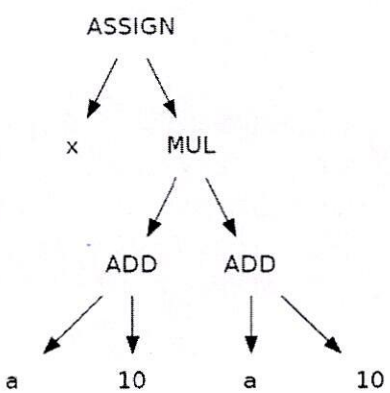
A) Instruction selection, Register allocation, Instruction scheduling.

B) Instruction selection, Register allocation, Sample scheduling.

C) Sample selection, Register allocation, Instruction scheduling.

D) Sample selection, Register allocation, Sample scheduling.

108. The AST representation of _____ expression that directly captures the following syntactic structure is-



A) x=(a*10)+(a*10)

B) x=(a+10)*(a*10)

C) x=(a*10)+(a+10)

D) x=(a+10)*(a+10)

109. A _____ is a function that maps from problem state descriptions to measures of desirability, usually represented as numbers.

A) Heuristic function

B) Search function

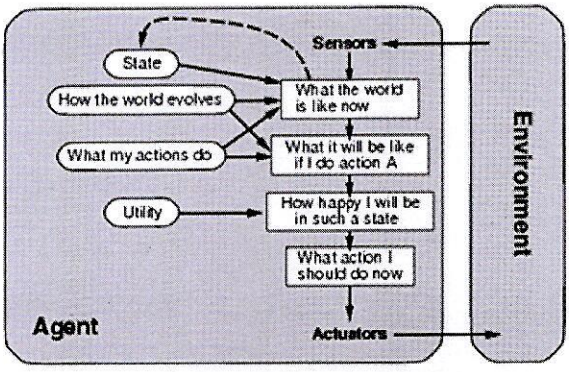
C) Expert function

D) Linear function

110. The PEAS in the task environment stands for-

A) Percentage, Environment, Agent, Structure
B) Performance, Environment, Agent, Sensors
C) Performance, Environment, Actuators, Sensors
D) Performance, Environment, Actuators, Structure

111. The following is the diagram for-



A) Simple Reflex Agent
B) Model-based Reflex Agent
C) Goal-based Agent
D) Utility-based Agent

112. Identify the **INCORRECT** option regarding the "Critical path when solving scheduling problems in Artificial intelligence".

A) It is a path whose total duration is shortest.
B) It determines duration of entire plan.
C) Shortening other paths does not shorten the plan as a whole.
D) Delaying the start of the action on the critical path slows down the whole plan.

113. Slot, facets, slot-filter knowledge representation are terminologies related to-

A) Logical Representation
B) Semantic Networks
C) Production Rules
D) Frames Representation

114. The main components of a business intelligence system, in order from bottom to top are-

A) Data source, Data warehouse, Data exploration, Data mining
B) Data source, Data exploration, Data warehouse, Data mining
C) Data source, Data mining, Data warehouse, Data exploration
D) Data source, Data warehouse, Data mining, Data exploration

115. _____ uses extraction and transformation tools known as Extract, Transform, Load (ETL), the data originating from the different sources for storage.

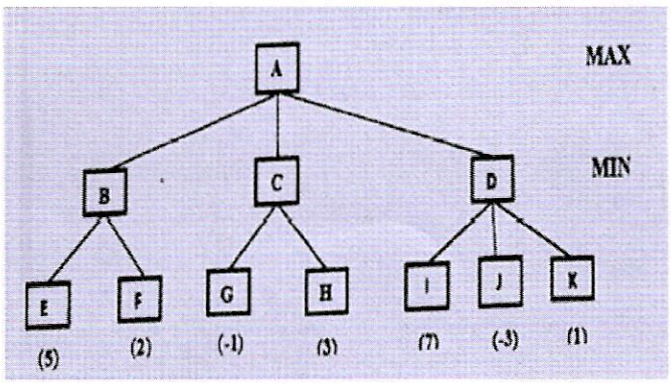
A) Data warehouse

B) Data mining

C) Database

D) Data structure

116. In the following two-ply game tree, the terminal nodes show the utility values computed by utility function. Use the Minimax algorithm to compute the utility values for nodes A, B, C and D in the given game tree.



A) 2, 2, -1, -3

B) 7, 2, 3, 7

C) -3, 2, -1, -3

D) 7, 5, 2, 7

117. The conceptual graph for- "Every motorbike has a handle" is-

A) [MOTORBIKE: $\forall$] $\rightarrow$ (PART) $\rightarrow$ [HANDLE]

B) [HANDLE: $\forall$] $\rightarrow$ (PART) $\rightarrow$ [MOTORBIKE]

C) (PART) $\rightarrow$ [MOTORBIKE: $\forall$] $\rightarrow$ [HANDLE]

D) [MOTORBIKE: $\forall$] $\rightarrow$ [HANDLE] $\rightarrow$ (PART)

118. Identify the option that is **NOT** a constraint in Business Intelligence Decision-making process.

A) Operational

B) Legal

C) Social

D) Profitability

119. In Business Intelligence, a decision is _____ if input flows, output flows and the transformations performed by the system can be clearly described in the three phases of intelligence, design and choice.

A) Structured
B) Semi-structured
C) Unstructured
D) Strategic

120. Identify the option that is **NOT** a way of represent Key Performance Indicator.

A) Format
B) Annotation
C) Timeliness on Delivery
D) Raw numbers

ROUGH WORK