

MIZORAM PUBLIC SERVICE COMMISSION

COMPETITIVE EXAMINATIONS FOR RECRUITMENT TO THE POST OF INSPECTOR OF LEGAL METROLOGY UNDER FOOD, CIVIL SUPPLIES & CONSUMER AFFAIRS DEPARTMENT, GOVERNMENT OF MIZORAM, DECEMBER, 2018

COMPUTER SCIENCE & ENGINEERING PAPER - III

Time Allowed : 2 hours

Full Marks : 200

*All questions carry equal marks of two (2) each.
Attempt all questions.*

1. Database _____, which is the logical design of the database, and the database _____, which is a snapshot of the data in the database at a given instant in time.
(a) Instance, Schema (b) Relation, Schema
(c) Relation, Domain (d) Schema, Instance
2. A domain is atomic if elements of the domain are considered to be _____ units.
(a) Different (b) Indivisible
(c) Constant (d) Divisible
3. A attribute in a relation is a foreign key if the _____ key from one relation is used as an attribute in that relation.
(a) Candidate (b) Primary
(c) Super (d) Sub
4. A _____ integrity constraint requires that the values appearing in specified attributes of any tuple in the referencing relation also appear in specified attributes of at least one tuple in the referenced relation.
(a) Referential (b) Referencing
(c) Specific (d) Primary
5. Which one of the following is a procedural language ?
(a) Domain relational calculus (b) Tuple relational calculus
(c) Relational algebra (d) Query language
6. Identify which of the following operation contains all pairs of tuples from the two relations, regardless of whether their attribute values match.
(a) Join (b) Cartesian product
(c) Intersection (d) Set difference
7. The basic data type char(n) is a _____ length character string and varchar(n) is _____ length character.
(a) Fixed, equal (b) Equal, variable
(c) Fixed, variable (d) Variable, equal
8. To remove a relation from an SQL database, we use the _____ command.
(a) Delete (b) Purge
(c) Remove (d) Drop table

9. _____ clause is an additional filter that is applied to the result.
- (a) Select
 - (b) Group-by
 - (c) Having
 - (d) Order by
10. Which of the following deletes all tuples in the instructor relation for those instructors associated with a department located in the MilleniumCenter building which is in department relation.
- (a) DELETE FROM instructor
WHERE dept_name IN ' MilleniumCenter ';
 - (b) DELETE FROM department
WHERE building=' MilleniumCenter ';
 - (c) DELETE FROM instructor
WHERE dept_name IN (SELECT dept name
FROM department
WHERE building = 'MilleniumCenter');
 - (d) None of these
11. In order to undo the work of transaction after last commit which one should be used?
- (a) View
 - (b) Commit
 - (c) Rollback
 - (d) Flashback
12. To include integrity constraint in a existing relation use :
- (a) Create table
 - (b) Modify table
 - (c) Alter table
 - (d) Drop table
13. An entity set that does not have sufficient attributes to form a primary key is termed a _____
- (a) Strong entity set
 - (b) Variant set
 - (c) Weak entity set
 - (d) Variable set
14. In the _____ normal form, a composite attribute is converted to individual attributes.
- (a) First
 - (b) Second
 - (c) Third
 - (d) Fourth
15. Empdt1(empcode, name, street, city, state,pincode).
- For any pincode, there is only one city and state. Also, for given street, city and state, there is just one pincode. In normalization terms, Empdt1 is a relation in
- (a) 1 NF only
 - (b) 2 NF and hence also in 1 NF
 - (c) 3NF and hence also in 2NF and 1NF
 - (d) BCNF and hence also in 3NF, 2NF and 1NF
16. Each modification done in database transaction are first recorded into the
- (a) Hard drive
 - (b) Log
 - (c) Disk
 - (d) Datamart
17. Which of the following is not a Armstrong's Axiom?
- (a) Reflexivity rule
 - (b) Transitivity rule
 - (c) Pseudotransitivity rule
 - (d) Augmentation rule
18. The subset of super key is a candidate key under what condition?
- (a) No proper subset is a super key
 - (b) All subsets are super keys
 - (c) Subset is a super key
 - (d) Each subset is a super key

30. Suppose relation R(A,B,C,D,E) has the following functional dependencies:

- A → B
- B → C
- BC → A
- A → D
- E → A
- D → E

Which of the following is not a key?

- (a) A
 - (b) E
 - (c) B,C
 - (d) D
31. Which of the following is used to insert a tuple from another relation.
- (a) INSERT INTO course (courseid, title, deptname, credits)
VALUES ('CS-437', 'DATABASESystems', 'CompSci.', 4);
 - (b) INSERT INTO instructor
SELECT ID, name, deptname, 18000
FROM student
WHERE deptname = 'Music' AND totcred > 144;
 - (c) INSERT INTO course VALUES ('CS-437', 'DATABASESystems', 'CompSci.', 4);
 - (d) None of these
32. Which of the following protocols ensures conflict serializability and safety from deadlocks?
- (a) Two-phase locking protocol
 - (b) Time-stamp ordering protocol
 - (c) Graph based protocol
 - (d) None of these
33. If transaction T_i gets an explicit lock on the file F_c in exclusive mode, then it has an _____ on all the records belonging to that file.
- (a) Explicit lock in exclusive mode
 - (b) Implicit lock in shared mode
 - (c) Explicit lock in shared mode
 - (d) Implicit lock in exclusive mode
34. A top to bottom relationship among the items in a database is established by a:
- (a) Hierarchical Schema
 - (b) Relational Schema
 - (c) Network Schema
 - (d) Distributed Schema
35. The level of data abstraction which describes how the data is actually stored is:
- (a) Physical level
 - (b) Conceptual level
 - (c) External level
 - (d) View level
36. Which layer is responsible for process to process delivery?
- (a) network layer
 - (b) transport layer
 - (c) session layer
 - (d) data link layer
37. Which layers of the OSI model are host-to-host layers?
- (a) Transport, Session, Presentation, Application
 - (b) Network, Transport, Session, Presentation
 - (c) Datalink, Network, Transport, Session
 - (d) Physical, Datalink, Network, Transport
38. In OSI network architecture, the routing is performed by
- (a) session layer
 - (b) application layer
 - (c) Network layer
 - (d) Transport layer

39. Which multiplexing technique transmits digital signals?
(a) FDM (b) TDM
(c) WDM (d) None of these
40. In _____ TDM, slots are dynamically allocated to improve bandwidth efficiency.
(a) synchronous (b) statistical
(c) isochronous (d) asynchronous
41. ASK, PSK, FSK, and QAM are examples of _____ encoding.
(a) analog-to-digital (b) analog-to-analog
(c) digital-to-analog (d) digital-to-digital
42. Phase shift keying (psk) method is used to modulate digital signals at 9600 bps using 16 levels. Find the line signaling speed (i.e., modulation rate)
(a) 1200 bands (b) 2400 bands
(c) 3600 bands (d) 4800 bands
43. How many bits are there in the Ethernet address?
(a) 64 bits (b) 32 bits
(c) 16 bits (d) 8 bits
44. FTP uses _____ parallel TCP connections to transfer a file
(a) 1 (b) 2
(c) 3 (d) 4
45. Typically the TCP port used by SMTP is
(a) 25 (b) 35
(c) 50 (d) 15
46. Connection establishment in TCP is done by which mechanism?
(a) Flow control (b) Three-Way Handshaking
(c) Forwarding (d) Synchronization
47. Which operating mode of telnet is full duplex?
(a) default mode (b) server mode
(c) line mode (d) client mode
48. Which error detection method consists of just one redundant bit per data unit?
(a) CRC (b) Checksum
(c) Simple parity check (d) Two-dimensional parity check
49. A _____ error means that two or more bits in the data unit have changed.
(a) burst (b) double-bit
(c) single-bit (d) none of these
50. Network in which every computer is capable of playing the role of client, server or both at the same time is called
(a) peer-to-peer network (b) local area network
(c) dedicated server network (d) wide area network
51. The _____ is the physical path over which a message travels
(a) Path (b) Medium
(c) Protocol (d) Route

52. A set of rules that governs data communication
- (a) Protocols
 - (b) Standards
 - (c) RFCs
 - (d) None of these
53. When collection of various computers seems a single coherent system to its client, then it is called
- (a) computer network
 - (b) distributed system
 - (c) networking system
 - (d) none of these
54. Two devices are in network if
- (a) a process in one device is able to exchange information with a process in another device
 - (b) a process is running on both devices
 - (c) PIDs of the processes running of different devices are same
 - (d) none of these
55. Communication channel is shared by all the machines on the network in
- (a) broadcast network
 - (b) unicast network
 - (c) multicast network
 - (d) none of these
56. Bluetooth is an example of
- (a) personal area network
 - (b) local area network
 - (c) virtual private network
 - (d) none of these
57. A _____ is a device that forwards packets between networks by processing the routing information included in the packet.
- (a) bridge
 - (b) firewall
 - (c) router
 - (d) all of these
58. A list of protocols used by a system, one protocol per layer, is called
- (a) protocol architecture
 - (b) protocol stack
 - (c) protocol suit
 - (d) none of these
59. Which one of the following extends a private network across public networks?
- (a) local area network
 - (b) virtual private network
 - (c) enterprise private network
 - (d) storage area network
60. The number of layers in Internet protocol stack
- (a) 5
 - (b) 7
 - (c) 6
 - (d) None of these
61. Application layer is implemented in
- (a) End system
 - (b) NIC
 - (c) Ethernet
 - (d) None of these
62. In the OSI model, as a data packet moves from the lower to the upper layers, headers are _____
- (a) Added
 - (b) Removed
 - (c) Rearranged
 - (d) None of these
63. Identify the statement which cannot be associated with OSI model
- (a) A structured way to discuss and easier update system components
 - (b) One layer may duplicate lower layer functionality
 - (c) Functionality at one layer no way requires information from another layer
 - (d) None of these

64. Which address identifies a process on a host?
- (a) physical address
 - (b) logical address
 - (c) port address
 - (d) specific address
65. The physical layer concerns with
- (a) bit-by-bit delivery
 - (b) process to process delivery
 - (c) application to application delivery
 - (d) none of these
66. physical layer provides
- (a) mechanical specifications of electrical connectors and cables
 - (b) electrical specification of transmission line signal level
 - (c) specification for IR over optical fiber
 - (d) all of these
67. The physical layer translates logical communication requests from the _____ into hardware specific operations.
- (a) data link layer
 - (b) network layer
 - (c) transport layer
 - (d) application layer
68. Wireless transmission can be done via
- (a) radio waves
 - (b) microwaves
 - (c) infrared
 - (d) all of these
69. Which sublayer of the data link layer performs data link functions that depend upon the type of medium?
- (a) logical link control sublayer
 - (b) media access control sublayer
 - (c) network interface control sublayer
 - (d) none of these
70. The Hamming distance between equal code words is _____.
- (a) 0
 - (b) 1
 - (c) n
 - (d) 2n
71. Which one of the following models is not suitable for accommodating any change?
- (a) Build & Fix Model
 - (b) Prototyping Model
 - (c) Evolutionary Model
 - (d) Waterfall Model
72. Which of the following life cycle model can be chosen if the development team has less experience on similar projects?
- (a) Spiral
 - (b) Waterfall
 - (c) RAD
 - (d) Iterative Enhancement Model
73. Choose an internal software quality from given below:
- (a) scalability
 - (b) usability
 - (c) reusability
 - (d) reliability
74. Which one of the following is a requirement that fits in a developer's module ?
- (a) Availability
 - (b) Testability
 - (c) Usability
 - (d) Flexibility

75. 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
76. In size oriented metrics, metrics are developed based on the _____
- (a) number of Functions
 - (b) number of user inputs
 - (c) number of lines of code
 - (d) amount of memory usage
77. Which of the following risk is the failure of a purchased component to perform as expected?
- (a) Product risk
 - (b) Project risk
 - (c) Business risk
 - (d) Programming risk
78. Which granularity level of testing checks the behavior of module cooperation?
- (a) Unit Testing
 - (b) Integration Testing
 - (c) Acceptance Testing
 - (d) Regression Testing
79. If P is risk probability, L is loss, then Risk Exposure (RE) is computed as _____ .
- (a) $RE = P/L$
 - (b) $RE = P + L$
 - (c) $RE = P * L$
 - (d) $RE = 2 * P * L$
80. If every requirement can be checked by a cost-effective process, then the SRS is _____ .
- (a) Verifiable
 - (b) Traceable
 - (c) Modifiable
 - (d) Complete
81. Which chart is a tool that depicts project as network diagram that is capable of graphically representing main events of project in both parallel and consecutive way?
- (a) PERT chart
 - (b) Gantt chart
 - (c) Pie Chart
 - (d) Bar Chart
82. Which is the most important feature of spiral model?
- (a) Quality management
 - (b) Risk management
 - (c) Performance management
 - (d) Efficiency management
83. The model in which the requirements are implemented by its category is _____ .
- (a) Evolutionary Development Model
 - (b) Waterfall Model
 - (c) Prototyping
 - (d) Iterative Enhancement Model
84. Identify the disadvantage of Spiral Model.
- (a) Doesn't work well for smaller projects
 - (b) High amount of risk analysis
 - (c) Strong approval and documentation control
 - (d) Additional Functionality can be added at a later date
85. In which test design each input is tested at both ends of its valid range and just outside its valid range?
- (a) Boundary value testing
 - (b) Equivalence class partitioning
 - (c) Boundary value testing AND Equivalence class partitioning
 - (d) Decision tables

86. Which of the following is not defined in a good Software Requirement Specification (SRS) document?
- (a) Functional Requirement
 - (b) Nonfunctional Requirement
 - (c) Goals of implementation
 - (d) Algorithm for software implementation
87. Which of the following is not a characteristic common to all design methods?
- (a) configuration management
 - (b) functional component
 - (c) notation quality assessment
 - (d) guidelines refinement heuristics
88. Checking quality of software in both simulated and live environments is known as
- (a) Validity
 - (b) Usability
 - (c) Checking
 - (d) Validation
89. Which may be estimated either in terms of KLOC (Kilo Line of Code) or by calculating number of function points in the software?
- (a) Time estimation
 - (b) Effort estimation
 - (c) Cost estimation
 - (d) Software size estimation
90. Selection of a model is based on
- (a) Requirements
 - (b) Development team & Users
 - (c) Project type and associated risk
 - (d) All of these
91. Which two models doesn't allow defining requirements early in the cycle?
- (a) Waterfall & RAD
 - (b) Prototyping & Spiral
 - (c) Prototyping & RAD
 - (d) Waterfall & Spiral
92. Which one of the following is not a software process quality?
- (a) Productivity
 - (b) Portability
 - (c) Timeliness
 - (d) Visibility
93. Purpose of process is to deliver software
- (a) in time
 - (b) with acceptable quality
 - (c) that is cost efficient
 - (d) both 'in time' & 'with acceptable quality'
94. The work associated with software engineering can be categorized into three generic phases, regardless of application area, project size, or complexity namely the _____ phase which focuses on what, the _____ phase which focuses on how and the _____ phase which focuses on change.
- i. support
 - ii. development
 - iii. definition
- (a) i, ii, iii
 - (b) ii, i, iii
 - (c) iii, ii, i
 - (d) iii, i, ii
95. Which is one of the most important stakeholder from the following ?
- (a) Entry level personnel
 - (b) Middle level stakeholder
 - (c) Managers
 - (d) Users of the software
96. Which is the first step in the software development life cycle ?
- (a) Analysis
 - (b) Design
 - (c) Problem/Opportunity Identification
 - (d) Development and Documentation

97. In Design phase, which is the primary area of concern?

- (a) Architecture
- (b) Data
- (c) Interface
- (d) All of these

98. Architectural Design Metrics are _____ in nature.

- (a) Black Box
- (b) White Box
- (c) Gray Box
- (d) Green Box

99. The amount of time that the software is available for use is known as

- (a) Reliability
- (b) Usability
- (c) Efficiency
- (d) Functionality

100. What are attributes of good software?

- (a) Software maintainability
- (b) Software functionality
- (c) Software development
- (d) Software maintainability & functionality

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