

MIZORAM PUBLIC SERVICE COMMISSION
TECHNICAL COMPETITIVE EXAMINATIONS FOR RECRUITMENT TO
JUNIOR ENGINEER (JE) CONTRACT BASIS
UNDER RURAL DEVELOPMENT DEPARTMENT, NOVEMBER, 2016.

COMPUTER SCIENCE ENGINEERING
PAPER - II

Time Allowed : 2 hours

Full Marks : 150

All questions carry equal marks of 2 each.

Attempt all questions

1. The number of interchanges required to sort 5, 1, 6, 2, 4 in ascending order using Bubble Sort is
(a) 6 (b) 5
(c) 7 (d) 8
2. A linear list of elements in which deletion can be done from one end (front) and insertion can take place only at the other end (rear) is known as a
(a) queue (b) stack
(c) tree (d) linked list
3. A full binary tree with n leaves contains
(a) n nodes (b) $\log_2 n$ nodes
(c) $2n - 1$ nodes (d) 2^n nodes
4. An undirected graph G with n vertices and e edges is represented by adjacency list. What is the time required to generate all the connected components?
(a) $O(n)$ (b) $O(e)$
(c) $O(e+n)$ (d) $O(e^2)$
5. What is the postfix form of the following prefix $*+ab-cd$
(a) $ab+cd-*$ (b) $abc+*-$
(c) $ab+*cd-$ (d) $ab+c*d-$
6. Which data structure is needed to convert infix notation to postfix notation?
(a) Branch (b) Queue
(c) Tree (d) Stack
7. The extra key inserted at the end of the array is called a _____
(a) End key (b) Stop key
(c) Sentinel (d) Transposition
8. In order to get the contents of a Binary search tree in ascending order, one has to traverse it in
(a) pre-order (b) in-order
(c) post order (d) None of these

9. How do you determine the cost of a spanning tree?
- (a) By the sum of the costs of the edges of the tree
 - (b) By the sum of the costs of the edges and vertices of the tree
 - (c) By the sum of the costs of the vertices of the tree
 - (d) By the sum of the costs of the edges of the graph
10. In analysis of algorithm, approximate relationship between the size of the job and the amount of work required to do is expressed by using _____
- (a) Central tendency
 - (b) Differential equation
 - (c) Order of execution
 - (d) Order of magnitude
11. For the quick sort algorithm, what is the time complexity of the best/worst case?
- (a) best case: $O(n)$ worst case: $O(n*n)$
 - (b) best case: $O(n)$ worst case: $O(n*\log(n))$
 - (c) best case: $O(n*\log(n))$ worst case: $O(n*\log(n))$
 - (d) best case: $O(n*\log(n))$ worst case: $O(n*n)$
12. $O(1)$ means computing time is _____
- (a) Constant
 - (b) Quadratic
 - (c) Linear
 - (d) Cubic
13. Finding the max element in an unordered stack would require
- (a) $O(1)$ operations
 - (b) $O(\log n)$ operations
 - (c) $O(n)$ operations
 - (d) None of these
14. Which of the following algorithm is used for data compression?
- (a) Pivot
 - (b) Huffman
 - (c) Sparse matrices
 - (d) Hashing
15. Which method of traversal does not use stack to hold nodes that are waiting to be processed?
- (a) Depth-first
 - (b) D-search
 - (c) Breadth-first
 - (d) Back-tracking
16. To avoid race condition, the number of processes that may be simultaneously inside their critical condition is:
- (a) 0
 - (b) 1
 - (c) 2
 - (d) 4
17. Program 'preemption' is
- (a) forced de allocation of the CPU from a program which is executing on the CPU.
 - (b) release of CPU by the program after completing its task.
 - (c) forced allotment of CPU by a program to itself.
 - (d) a program terminating itself due to detection of an error.
18. Which scheduling policy is most suitable for a time-shared operating system
- (a) Shortest-job First
 - (b) Elevator
 - (c) Round-Robin
 - (d) First-Come-First-Serve

19. Which of the following is not a key piece of information, stored in single page table entry, assuming pure paging and virtual memory
- (a) Frame number
 - (b) A bit indicating whether the page is in physical memory or on the disk
 - (c) A reference for the disk block that stores the page
 - (d) None of these
20. Which amongst the following is not a valid page replacement policy?
- (a) LRU policy (Least Recently Used)
 - (b) FIFO policy (First in first out)
 - (c) RU policy (Recurrently used)
 - (d) Optimal page replacement policy
21. A set of techniques that allow to execute a program which is not entirely in memory is known as
- (a) demand paging
 - (b) virtual memory
 - (c) auxiliary memory
 - (d) secondary memory
22. The total time to prepare a disk drive mechanism for a block of data to be read from is its _____
- (a) latency
 - (b) latency plus transmission time
 - (c) latency plus seek time
 - (d) latency plus seek time plus transmission time
23. The Banker's Algorithm is an example of a technique for:
- (a) deadlock prevention
 - (b) deadlock avoidance
 - (c) deadlock detection
 - (d) deadlock recovery
24. Process is
- (a) A program in execution
 - (b) An instance of a program running on a computer
 - (c) The entity that can be assigned to and executed
 - (d) All of these
25. is the ability of multiple process to co-ordinate their activities by exchange of information
- (a) Synchronization
 - (b) Mutual Exclusion
 - (c) Dead lock
 - (d) Starvation
26. A direct method of deadlock prevention is to prevent the occurrence of
- (a) Mutual exclusion
 - (b) Hold and wait
 - (c) Circular waits
 - (d) No preemption
27. Block or Buffer caches are used
- (a) to improve disk performance
 - (b) to handle interrupts
 - (c) to increase the capacity of main memory
 - (d) to speed up main memory read operation
28. An optimal scheduling algorithm in terms of minimizing the average waiting time of a given set of processes is
- (a) FCFS scheduling algorithm
 - (b) Round robin scheduling algorithm
 - (c) Shortest job - first scheduling algorithm
 - (d) None of these
29. Which of the following is contained in Process Control Block (PCB)?
- (a) Process Number
 - (b) List of Open files
 - (c) Memory Limits
 - (d) All of these

30. The removal of process from active contention of CPU and reintroduce them into memory later is known as _____.
- (a) Interrupt (b) Swapping
(c) Signal (d) Thread
31. UDP packets have fixed-size header of bytes.
- (a) 16 (b) 8
(c) 32 (d) 64
32. If you use either Telnet or FTP, which is the highest layer you are using to transmit data?
- (a) Application (b) Session
(c) Transport (d) Network
33. Choose the correct HTML tag for the largest heading?
- (a) <H1> (b) <H6>
(c) <H10> (d) <HEAD>
34. What is the correct syntax in HTML for creating a link on a webpage?
- (a) <LINK SRC= "abc.html"> (b) <BODY LINK = "abc.html">
(c) (d) < A HREF = "def.html">
35. <TD> ... </TD> tag is used for _____
- (a) Table heading (b) Table Records
(c) Table row (d) None of these
36. How can you make a bulleted list?
- (a) <list> (b) <nl>
(c) (d)
37. Which of the following is the largest community in classification of e-commerce?
- (a) Business to Business (B to B) (b) Business to Consumer (B to C)
(c) Business to Government (B to G) (d) Government to Government (G to G)
38. is simply the use of electronic means to transfer funds directly from one account to another, rather than by cheque or cash.
- (a) M-Banking (b) O-Banking
(c) E-Banking (d) D-Banking
39. Default scripting language in ASP.
- (a) EcmaScript (b) VBScript
(c) PERL (d) JavaScript
40. Which of the following address use 7 bits for the <network> and 24 bits for the <host> portion of the IP address.
- (a) Class A (b) Class B
(c) Class C (d) Class D
41. Which of the transport layer protocols is connectionless oriented protocol?
- (a) UDP (b) TCP
(c) FTP (d) None of these

42. The loss of energy as the signal propagates outward.
- (a) Attenuation
 - (b) Distortion
 - (c) Noise
 - (d) Baud
43. A protocol is a set of rules governing the communication that take place ____
- (a) between an interface
 - (b) between peers
 - (c) between modems
 - (d) across an interface
44. Which of the following plays a major role in order to deliver a message to the correct application program running on a host?
- (a) Port
 - (b) IP
 - (c) physical
 - (d) tunnel
45. End-to-end connectivity is provided from host-to-host in which of the following layer?
- (a) session layer
 - (b) presentation layer
 - (c) transport layer
 - (d) network layer
46. You want to implement a mechanism that automates the IP configuration, including IP address, subnet mask, default gateway, and DNS information. Which protocol will you use to accomplish this?
- (a) SMTP
 - (b) SNMP
 - (c) DHCP
 - (d) HTTP
47. The set of operations or language that the DBMS provides for retrieval, insertion, deletion and modification of data is called
- (a) View definition language
 - (b) Storage definition language
 - (c) Data definition language
 - (d) Data manipulation language
48. The capacity to change the conceptual schema without having to change the external schemas is
- (a) Schema data independence
 - (b) Logical data independence
 - (c) Physical data independence
 - (d) Model data independence
49. The constraint that specifies whether the existence of an entity depends on its being related to another entity via relationship type.
- (a) Participation constraint
 - (b) Primary key constraint
 - (c) Entity types
 - (d) Data model
50. The following SQL command is used for adding new column in a table called employee.
- (a) alter table employee add column address varchar(30);
 - (b) alter employee add column address varchar(30);
 - (c) update table employee add column address varchar(30);
 - (d) update employee add column address varchar(30);
51. SQL command **update employee set address='Zarkawt'** would result in
- (a) Changing the column address of the first record in the employee table to Zarkawt.
 - (b) Changing the column address of the last record in the employee table to Zarkawt.
 - (c) Changing the column address of the current record in the employee table to Zarkawt.
 - (d) Changing the column address of all the records in the employee table to Zarkawt.
52. One of the desirable properties of transaction processing is
- (a) Composite attribute
 - (b) Cost based query optimization
 - (c) Atomicity
 - (d) Recurrence

53. If every transaction in the schedule reads only items that were written by committed transactions, then the schedule is said to be
- (a) Cascadeless schedule
 - (b) Partial order
 - (c) Strict schedule
 - (d) Unstrict schedule
54. If timestamp (TS) $TS(T_i) < TS(T_j)$, then (T_i older than T_j) T_i is allowed to wait; otherwise (T_i younger than T_j) abort T_i (T_i dies) and restart it later with the same timestamp. The rules mentioned above belong to which scheme.
- (a) Wait-die
 - (b) Wound-wait
 - (c) Cautious waiting
 - (d) Wait-for graph
55. It distributes a relation into sets of tuples (rows)
- (a) Vertical fragmentation
 - (b) Horizontal fragmentation
 - (c) Replication fragmentation
 - (d) Diagonal fragmentation
56. Consider the structure of the EMPLOYEES table:
EMPLOYEE_ID NUMBER Primary Key
FIRST_NAME VARCHAR2(25)
LAST_NAME VARCHAR2(25)
Which of the statement insert row into the table EMPLOYEE?
- (a) INSERT INTO employees VALUES (NULL, 'John', 'Smith');
 - (b) INSERT INTO employees(first_name, last_name) VALUES('John', 'Smith');
 - (c) INSERT INTO employees VALUES ('1000', 'John', NULL);
 - (d) INSERT INTO employees(first_name, last_name, employee_id) VALUES (1000, 'John', 'Smith');
57. Identify DML statement?
- (a) CREATE
 - (b) UPDATE
 - (c) DELETE
 - (d) COMMIT
58. Drop Table cannot be used to drop a table referenced by a constraint.
- (a) Local Key
 - (b) Primary Key
 - (c) Composite Key
 - (d) Foreign Key
59. Deadlocks are possible only when one of the transactions wants to obtain a(n) ____ lock on a data item.
- (a) binary
 - (b) exclusive
 - (c) shared
 - (d) Complete
60. The statement which is used to end a successful transaction is
- (a) COMMIT
 - (b) DONE
 - (c) END
 - (d) QUIT
61. To delete a database which of the following command is used
- (a) delete database database_name
 - (b) Delete database_name
 - (c) drop database database_name
 - (d) drop database_name
62. Checkpoints are used for the purpose of
- (a) Recovery measures
 - (b) Security measures
 - (c) Concurrency measures
 - (d) Authorization measures

63. If an attribute of a composite key is dependent on an attribute of other composite key, then we say that a relation is in
(a) 2NF (b) 3NF
(c) BCNF (d) 1NF
64. If two relations R and S are joined, then the non matching tuples of both R and S are ignored in
(a) left outer join (b) right outer join
(c) full outer join (d) inner join
65. Which of the following is not a recovery technique?
(a) Deferred update (b) Immediate update
(c) Two-phase commit (d) Shadow paging

Directions (Questions 66): Choose the correct alternative that will continue the same pattern and replace the question mark in the given series.

66. 120, 99, 80, 63, 48 ?
(a) 35 (b) 38
(c) 39 (d) 40

67. Study the following table and answer the questions based on it.
Expenditures of a Company (in Lakh Rupees) per Annum Over the given Years.

Year	Item of Expenditure				
	Salary	Fuel and Transport	Bonus	Interest on Loans	Taxes
1998	288	98	3.00	23.4	83
1999	342	112	2.52	32.5	108
2000	324	101	3.84	41.6	74
2001	336	133	3.68	36.4	88
2002	420	142	3.96	49.4	98

What is the average amount of interest per year which the company had to pay during this period?

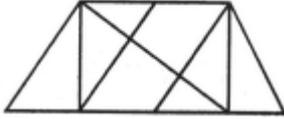
- (a) Rs. 32.43 lakhs (b) Rs. 33.72 lakhs
(c) Rs. 34.18 lakhs (d) Rs. 36.66 lakhs
68. Arrange the words given below in a meaningful sequence.
1. Word 2. Paragraph 3. Sentence
4. Letters 5. Phrase
(a) 4, 1, 5, 2, 3 (b) 4, 1, 3, 5, 2
(c) 4, 2, 5, 1, 3 (d) 4, 1, 5, 3, 2
69. Arrange the words given below in a meaningful sequence.
1. Police 2. Punishment 3. Crime
4. Judge 5. Judgement
(a) 3, 1, 2, 4, 5 (b) 1, 2, 4, 3, 5
(c) 5, 4, 3, 2, 1 (d) 3, 1, 4, 5, 2

Directions (Questions 70): Pick out the most effective word(s) from the given words to fill in the blank to make the sentence meaningfully complete.

70. Catching the earlier train will give us the to do some shopping.

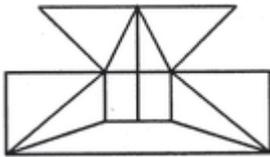
- (a) chance
- (b) luck
- (c) possibility
- (d) occasion

71. Find the number of triangles in the given figure.



- (a) 8
- (b) 10
- (c) 12
- (d) 14

72. Find the minimum number of straight lines required to make the given figure.



- (a) 16
- (b) 17
- (c) 18
- (d) 19

Directions (Questions 73): In each of the following questions, arrange the given words in a meaningful sequence and thus find the correct answer from alternatives.

73. Y is in the East of X which is in the North of Z. If P is in the South of Z, then in which direction of Y, is P?

- (a) North
- (b) South
- (c) South-East
- (d) None of these

Directions (Questions 74): Find the statement that must be true according to the given information.

74. Vincent has a paper route. Each morning, he delivers 37 newspapers to customers in his neighbourhood. It takes Vincent 50 minutes to deliver all the papers. If Vincent is sick or has other plans, his friend Thomas, who lives on the same street, will sometimes deliver the papers for him.

- (a) Vincent and Thomas live in the same neighbourhood.
- (b) It takes Thomas more than 50 minutes to deliver the papers.
- (c) It is dark outside when Vincent begins his deliveries.
- (d) Thomas would like to have his own paper route.

Directions (Questions 75): Read the question carefully and choose the correct answer.

75. Four people witnessed a mugging. Each gave a different description of the mugger. Which description is probably right?

- (a) He was average height, thin, and middle-aged.
- (b) He was tall, thin, and middle-aged.
- (c) He was tall, thin, and young.
- (d) He was tall, of average weight, and middle-aged.