

UGC NET 22nd June 2026 Shift 2 Computer Science Memory Based Paper

Q1. Consider the following statements:

Statement I: LALR parser is more powerful than canonical LR Parser.

Statement II: SLR parser is more powerful than LALR.

Which of the following is correct?

- (a) Statement I true and Statement II false
- (b) Statement I false and Statement II true
- (c) Both Statement I and Statement II false
- (d) Both Statement I and Statement II true

Ans.(c)

Q2. Which of

- (a) LL(1) Par
- (b) LR(1) Par
- (c) Recursive
- (d) LALR(1) I

Ans.(a)

Q3. Arrange

powerful par

- A. LR(0)
- B. LR(1)
- C. LALR(1)
- D. LL(0)
- E. SLR

Choose the co

- (a) $LL(0) \rightarrow LR(0) \rightarrow LR(1) \rightarrow LALR(1)$
- (b) $SLR \rightarrow LR(0) \rightarrow LR(1) \rightarrow LALR(1)$
- (c) $LL(0) \rightarrow LR(0) \rightarrow SLR \rightarrow LALR(1) \rightarrow LR(1)$
- (d) $LR(0) \rightarrow LR(1) \rightarrow SLR \rightarrow LALR(1)$

Ans.(c)

Q4. Consider

1. Every SLR(1) grammar is inherently unambiguous, but not every unambiguous grammar is SLR(1).
2. Constructing an LALR(1) parser by merging CLR(1) states can introduce new Shift-Reduce conflicts that did not exist in the CLR(1) parser.
3. A CLR(1) parsing table will always contain strictly more states than an LALR(1) parsing table for any given CFG.
4. If an LR(0) item set contains $A \rightarrow \alpha$ and $B \rightarrow \beta$, it results in a Reduce-Reduce conflict in an SLR(1) parser only if $FOLLOW(A) \cap FOLLOW(B) \neq \emptyset$

Which of the given statements are correct?

- (a) Only 1 and 2
- (b) Only 1 and 4
- (c) Only 1, 3 and 4
- (d) Only 2 and 3

Ans.(b)

Q5. Choose the correct sequence to build the table of SLR(1):

1. Build LR(0) item automaton.
 2. Compute FIRST/FOLLOW sets.
 3. In ACTION, place reductions for items A\to \alpha. under tokens in FOLLOW(A).
 4. Fill shifts/gotos from GOTO transitions.
- (a) 2 → 1 → 4 → 3
 (b) 1 → 2 → 4 → 3
 (c) 1 → 2 → 3 → 4
 (d) 2 → 1 → 3 → 4

Ans.(c)

Q6. Which of

- (a) ALGOL
 (b) C
 (c) COBOL
 (d) C++

Ans.(a)

Q7. Following

LXI SP, EFFH
 CALL 3000H
 3000 H : LXI
 PUSH PSW
 SPHL
 POP PSW
 RET

On completion of execution of SLR

- (a) 3CF0 H
 (b) 3CF8 H
 (c) EFFD H
 (d) EFFH

Ans.(b)

Q8. Match List

	List – I		List – II
A.	Handshaking	I.	I/O interface informs the CPU that device is ready transfer.
B.	Programmed I/O	II.	Requires two control signals working in opposite direction.
C.	Interrupt initiated I/O	III.	Has local memory & control large set of I/O devices.
D.	I/O processor	IV.	Required CPU to check the I/O flag & perform transfer.

Choose the correct option from those given below:

Match the columns.

- (a) A-I, B-II, C-III, D-IV
 (b) A-II, B-IV, C-III, D-I
 (c) A-II, B-IV, C-I, D-III
 (d) A-IV, B-III, C-II, D-I

Ans.(c)

Q9. What will be the output of the following C programming code?

```
int i, j;  
for(i = 1; i < 5; i += 2)  
for(j = 1; j < i; j += 2)  
printf("%d ", j);
```

- (a) 1
- (b) 1 2
- (c) 1 3
- (d) 1 1 3

Ans.(a)

Q10. Which of the following are valid C identifiers?

- A. A constructor
- B. A constructor
- C. A constructor
- D. A constructor

Choose the correct answer from the following:

- (a) B, C, D only
- (b) B, C only
- (c) A, B, C only
- (d) A, B only

Ans.(d)

Q11. Which of the following are valid C identifiers?

- (a) Addition
- (b) Function
- (c) Scope Resolution and Member Access
- (d) Assignment

Ans.(c)

Q12. Consider the following two problems:

- A. The final state of the system is a dual in itself.
- B. If either the problem has a finite optimal solution, then the other problem has a finite optimal solution.

C. If either problem has an unbounded optimum solution, then the other problem has no feasible solution at all.

Which of the statements is (are) correct?

- (a) only (A) and (B)
- (b) only (A) and (C)
- (c) only (B) and (C)
- (d) (A), (B) and (C)

Ans.(d)

Q13. Consider the following statements about page replacement policies:

P: Optimal page replacement is theoretical because it requires future knowledge.

Q: LRU approximates Optimal by replacing the page least recently used.

R: FIFO may suffer from Belady's Anomaly.

Which statements are correct?

- (a) Only P and Q
- (b) Only Q and R
- (c) Only P and R
- (d) P, Q, and R

Ans.(d)

Q14. Which of the following is not a valid operation on one tuple in the relation schema?

- (a) $\forall$
- (b) $\exists$
- (c) σ
- (d) π

Ans.(b)

Q15. If memory is 100 MB and 11 MB is used, then what is the percentage of free memory?

- (a) 93%
- (b) 90%
- (c) 88%
- (d) None of the above

Ans.(b)

Q16. Match List I with List II.

List I: Process	List II: Functional Characteristic
A. Compiler	I. Translates assembly language into machine code
B. Interpreter	II. Executes instructions one by one
C. Assembler	III. Converts high-level language into assembly language
D. Linker	IV. Combines object files into an executable file

- A. Compiler
- B. Interpreter
- C. Assembler
- D. Linker

Choose the correct match.

- (a) A-II, B-III, C-IV, D-I
- (b) A-I, B-II, C-IV, D-III
- (c) A-III, B-IV, C-II, D-I
- (d) A-II, B-III, C-I, D-IV

Ans.(d)

Q17. Match List – I with List – II:

	List – I		List – II
A.	Data Link Layer	I.	True end-to-end layer
B.	Network Layer	II.	Token Management
C.	Transport Layer	III.	Produce billing information
D.	Session Layer	IV.	Piggybacking

Choose the correct answer from the options given below:

Match the columns.

- (a) A - IV, B - III, C - I, D - II
- (b) A - IV, B - II, C - I, D - III
- (c) A - II, B - III, C - I, D - IV
- (d) A - IV, B -

Ans.(a)

Q18. Match List

	List - I		List - II
A.	Physical layer	I.	Routing of the signals divide the outgoing message into packets, to act as network controller for routing data.
B.	Data link layer	II.	Make and break connections, define voltages and data rates, convert data bits into electrical signal.
C.	Network layer	III.	Synchronization, error detection and correction. To assemble outgoing message into frames.
D.	Presentation layer	IV.	It works as a translating layer.

Choose the correct answer from the options given below:

Match the columns.

- (a) A-IV, B-III, C-I, D-II
- (b) A-II, B-III, C-I, D-IV
- (c) A-IV, B-III, C-I, D-II
- (d) A-II, B-III, C-I, D-IV

Ans.(d)

Q19. Match List

	List – I		List – II
A.	TCP	I.	Flow control mechanism
B.	UDP	II.	Flow control mechanism
C.	SCTP	III.	Multistreaming support
D.	Sliding Window	IV.	Flow control mechanism

Choose the correct answer:

- (a) A-I, B-II, C-IV, D-III
- (b) A-IV, B-II, C-I, D-III
- (c) A-II, B-III, C-IV, D-I
- (d) A-II, B-I, C-III, D-IV

Ans.(d)

Q20. Arrange the following protocol data units (PDUs) in the correct descending order as they are encapsulated traversing down the OSI model from the Application Layer to the Physical Layer:

- A. Packet
- B. Frame
- C. Data (Message)
- D. Bit
- E. Segment
- (a) $C \rightarrow A \rightarrow E \rightarrow B \rightarrow D$
- (b) $C \rightarrow E \rightarrow A \rightarrow B \rightarrow D$
- (c) $E \rightarrow C \rightarrow A \rightarrow B \rightarrow D$
- (d) $C \rightarrow E \rightarrow B \rightarrow A \rightarrow D$

Ans.(b)

Q21. Arrange

- 1. Append r z
- 2. Divide by g
- 3. Replace the
- 4. Transmit r

- (a) $1 \rightarrow 2 \rightarrow 3$
- (b) $2 \rightarrow 1 \rightarrow 3$
- (c) $1 \rightarrow 3 \rightarrow 2$
- (d) $2 \rightarrow 3 \rightarrow 1$

Ans.(a)

Q22. Which of the following are transmission errors?

- (i) Noise and interference cause transmission errors.
- (ii) Parity check is only a good method for error detection.
- (iii) Cyclic Redundancy Check (CRC) is more robust than parity check for detecting errors.
- (iv) In a perfect communication channel with no interference, transmission errors can still occur due to faulty hardware.

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

Ans.(c)

Q23. Match the fundamental data structure listed in List-I with its primary application or structural characteristic defined in List-II:

	List - I		List - II
A.	Stack	I.	Recursion
B.	Queue	II.	Buffering
C.	Graph	III.	Cycle
D.	Tree	IV.	Hierarchical

- (a) A-I, B-II, C-IV, D-III
- (b) A-I, B-II, C-III, D-IV

- (c) A-III, B-II, C-I, D-IV
(d) A-II, B-I, C-III, D-IV

Ans.(b)

Q24. Match the LIST – I with LIST – II.

	List – I (Algorithm)		List – II (Complexity)
A.	Insertion Sort	I.	$O(\log n)$
B.	Binary Search	II.	$O(n^2)$
C.	Quick Sort	III.	$O(n - 1)$
D.	Selection Sort	IV.	$O(n \log n)$

Choose the correct answer from the options given below:

Match the columns

- (a) A-III, B-I, C-II, D-IV
(b) A-II, B-III, C-I, D-IV
(c) A-I, B-II, C-III, D-IV
(d) A-II, B-III, C-I, D-IV

Ans.(a)

Q25. A Boolean function $F(A, B, C, D)$ is defined by the following truth table. Simplify the function using Karnaugh map simplification, which is the most efficient method.

- (a) $AD + BC$
(b) $BC + AD$
(c) $BD + ABC$
(d) $CD + A'B'$

Ans.(d)

Q26. Which of the following are properties of a subgroup H of a group G ?

- I. H contains the identity element of G .
II. The inverse of every element in H is also in H .
III. The product of any two elements in H is in H .
IV. H is a cyclic group.

Select all that apply.

- (a) I, II and III
(b) I and IV
(c) II and IV
(d) All of the above

Ans.(a)

Q27. Given the following scenario for a single-layer perceptron with a threshold activation function:

- Inputs:
 $x_1 = 0.5, x_2 = 0.2$
- Weights:
 $w_1 = 0.4, w_2 = 0.7$
- Bias: $b = -0.3$

The perceptron uses a threshold activation function $f(x) = 1$ if $x \geq 0$ and $f(x) = 0$ otherwise. What is the output of the perceptron?

- (a) 0.04
- (b) 1
- (c) 0.9
- (d) 1.2

Ans.(a)

Q28. Every subgroup of an Abelian group is not -

- (a) cyclic
- (b) Abelian
- (c) normal
- (d) None of the above

Ans.(a)

Q29. An abelian group is -

- (a) exactly one
- (b) exactly two
- (c) no subgroup
- (d) more than one

Ans.(d)

Q30. The harmonic mean of 11 and 12 is -

- (a) 2
- (b) 3
- (c) 4
- (d) 5

Ans.(b)

Q31. In a medical expert system using Bayesian reasoning, a disease D has a prior probability $P(D) = 0.1$. A lab test T returns positive results with a probability of 0.9 if the patient has the disease and the system uses:

- $P(T | D) = 0.9$
- $P(T | \neg D) = 0.1$

Using Bayes' theorem, the probability of the patient having the disease given a positive test result is:

- (a) 0.33
- (b) 0.36
- (c) 0.45
- (d) 0.69

Ans.(a)

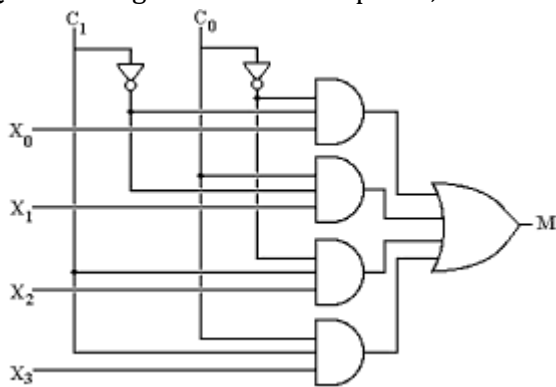
Q32. Arrange the disk scheduling algorithms in the correct order of their efficiency for accessing a specific disk request in a large disk queue:

1. SSTF
2. FCFS
3. SCAN
4. LOOK

- (a) $1 \rightarrow 2 \rightarrow 3 \rightarrow 4$
- (b) $2 \rightarrow 1 \rightarrow 4 \rightarrow 3$
- (c) $1 \rightarrow 4 \rightarrow 3 \rightarrow 2$
- (d) $4 \rightarrow 3 \rightarrow 1 \rightarrow 2$

Ans.(c)

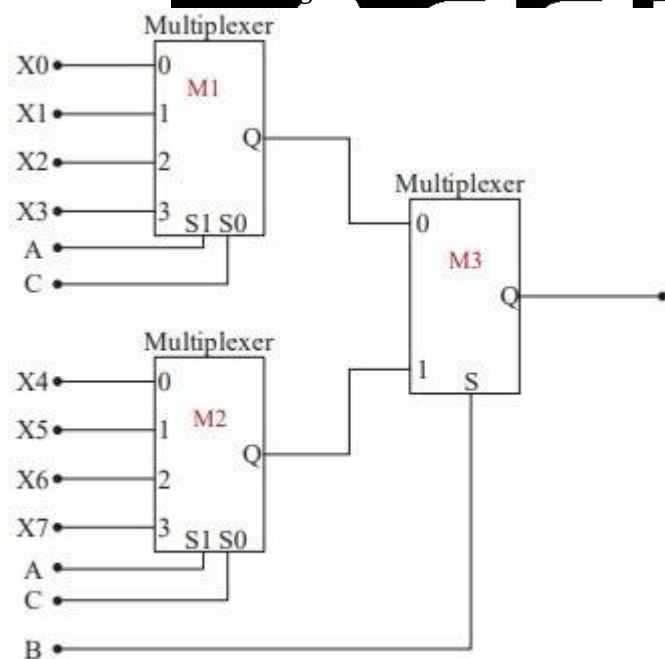
Q33. In the given 4-to-1 multiplexer, if $c_1 = 0$ and $c_0 = 1$ then the output M is _____



- (a) X_0
- (b) X_1
- (c) X_2
- (d) X_3

Ans.(b)

Q34. A Boolean function $F(X_0, X_1, X_2, X_3, X_4, X_5, X_6, X_7, A, B, C)$ is implemented using two 4-input multiplexers (M1 and M2) and one 2-input multiplexer (M3) as shown below. The output of the circuit is _____



Which one of the following set of values of $(X_0, X_1, X_2, X_3, X_4, X_5, X_6, X_7)$ will realise the Boolean function $A^+ + A^+ \cdot C^- + A \cdot B^- \cdot CA^- + A^- \cdot C^- + A \cdot B^- \cdot C$?

- (a) (1, 1, 0, 0, 1, 1, 1, 0)
- (b) (1, 1, 0, 0, 1, 1, 0, 1)
- (c) (1, 1, 0, 1, 1, 1, 0, 0)
- (d) (0, 0, 1, 1, 0, 1, 1, 1)

Ans.(a)

Q35. Which of the following is NOT a phase in the Software Development Life Cycle (SDLC)?

- (a) Requirement Analysis
- (b) System Design
- (c) Coding
- (d) Marketing

Ans.(d)

Q36. Arrange the following phases in the correct order of the software development life cycle:

- A. Integration
- B. Unit testing
- C. System Test
- D. Acceptance

Choose the correct sequence from the following:

- (a) B, C, A, D
- (b) B, A, C, D
- (c) C, B, A, D
- (d) C, B, D, A

Ans.(b)

Q37. Which of the following tuple relational calculus (TRC) expressions correctly retrieve all tuples t from relation R such that the value of attribute A in t is greater than 10?

- (a) $\{t \mid R(t) \wedge A > 10\}$
- (b) $\{t \mid t \in R \wedge A > 10\}$
- (c) $\{t \mid A(t) > 10\}$
- (d) $\{t \mid \forall A > 10\}$

Ans.(a)

Q38. Consider $R(A, B, C, D, E)$ be relation with following dependencies:

- $C \rightarrow F$,
- $E \rightarrow A$,
- $EC \rightarrow D$,
- $A \rightarrow B$

Which of the following is a key for R ?

- (a) CD
- (b) EC
- (c) AE
- (d) AC

Ans.(b)

Q39. Match the following:

	List - I (Concept)		List - II (Characteristics)
A.	Conflict Serializability	I.	Based on precedence graph with no cycles.
B.	View Serializability	II.	Same final state as some serial schedule.
C.	Recoverable Schedule	III.	A transaction commits only after others it depends on commit.
D.	Cascadeless Schedule	IV.	Prevents aborts from propagating.

A. A-II, B-I, C-III, D-IV

(b) A-I, B-II, C-III, D-IV

(c) A-II, B-IV, C-I, D-III

(d) A-IV, B-II

Ans.(b)

Q40. Using 'P' and 'V' semaphore keys are:

(a) 7, 4

(b) 7, 1

(c) 7, 46

(d) 55, 1

Ans.(c)

Q41. A system has 4 processors. The degree of parallelism is 60%. If the number of processors is increased to 4, what is the maximum speedup that can be achieved if the number of processors is increased to 4?

(a) 1.55

(b) 1.82

(c) 2.50

(d) 1.40

Ans.(b)

Q42. Let R be a relation on a set D such that:

$$E = \{(a, b) \mid (a, b) \in R \text{ and } (b, a) \in R\}$$

The relation R

(a) a partial order

(b) a total order

(c) an equivalence relation

(d) none of the above

Ans.(c)

Q43. Match List - I with List - II.

	List - I (Software Process Model)		List - II (Description)
A.	Waterfall Model	I.	Software can be developed incrementally
B.	Evolutionary Model	II.	Requirement compromises are inevitable
C.	Component-based Software Engineering	III.	Explicit recognition of risk
D.	Spiral Development	IV.	Inflexible partitioning of the project into stages

Choose the correct answer from the options given below:

Match the columns.

(a) A – IV, B – I, C – III, D – II

(b) A – I, B – IV, C – II, D – III

(c) A – II, B – III, C – I, D – IV

(d) A – IV, B – I, C – III, D – II

Ans.(d)

Q44. Match the

	List - I (Models)		List - II (Descriptions)
A.	Waterfall Model	I.	where the next phase begins only after the previous phase is completed
B.	Spiral Model	II.	emphasizes on iterative development
C.	V-Model	III.	emphasizes on testing and verification
D.	Agile Model	IV.	Encourages flexibility and frequent releases with user feedback

(a) A → I, B → II, C → III, D → IV

(b) A → II, B → I, C → III, D → IV

(c) A → III, B → II, C → I, D → IV

(d) A → IV, B → I, C → III, D → II

Ans.(a)

Q45. If we want to display a 420x420 pixel image on a screen with an aspect ratio of 16:9, what would be the width of the image?

(a) 420 Pixels

(b) 460 Pixels

(c) 480 Pixels

(d) 540 Pixels

Ans.(c)

Directions (46-50): Read the given passage and answer the following questions.

Software Engineering is a systematic approach to the development, maintenance and testing of software applications. This field emphasizes principles of engineering to create reliable and efficient software that meets user needs within specified timelines. The software development life cycle (SDLC) is a fundamental concept in software engineering, encompassing stages such as requirements gathering, system design, coding, testing, deployment, and maintenance. Various models, like the Waterfall, Agile, and Spiral models, offer different frameworks for managing these stages. Agile, for example, focuses on iterative development and continuous

feedback, enabling teams to adapt to changing requirements quickly. Quality assurance through testing is critical in software engineering, ensuring that software functions as expected and remains secure. Furthermore, software engineering practices emphasize the importance of documentation, version control, and project management to facilitate smooth development and maintenance processes. This discipline is integral in today's technology-driven world, supporting innovation and ensuring that software systems are reliable and effective.

Q46. What is the purpose of Software Engineering?

- (a) To develop hardware
- (b) To create reliable software systematically
- (c) To manage databases
- (d) To build network systems

Ans.(b)

Q47. Which model is most suitable for developing software with changing requirements?

- (a) Waterfall
- (b) Agile
- (c) Spiral
- (d) Prototype

Ans.(b)

Q48. What does SDLC stand for?

- (a) Software Development Life Cycle
- (b) Secure Development Life Cycle
- (c) System Development Life Cycle
- (d) Software Development Life Cycle

Ans.(d)

Q49. Why is documentation essential in Software Engineering?

- (a) It accelerates development speed.
- (b) It helps verify software functionality and security.
- (c) It reduces documentation needs.
- (d) It avoids communication gaps.

Ans.(b)

Q50. What practice is crucial for maintaining software quality?

- (a) Testing
- (b) Documentation
- (c) Version control
- (d) Debugging

Ans.(c)

