

TEST SERIES NTA-UGC-NET/JRF DEC. 2019

BOOKLET SERIES **B**

Paper Code **87**

Test Type: **TEST SERIES**

Full Length Test Series-2

COMPUTER SCIENCE & APPLICATIONS

Duration: 03:00 Hours

Date: 25-11-2019

Maximum Marks: 300

Read the following instructions carefully:

1. Single Paper Test is divided into **TWO** Parts.
2. **Paper - I:** This part shall carry **50** questions. Each question shall be of **2 marks**.
3. **Paper - II:** This part shall contain **100** questions. Each question shall be of **2 marks**.
4. There will be no negative marking.
5. Darken the appropriate bubbles with HB pencil/Ball Pen to write your answer.
6. The candidates shall be allowed to carry the Question Paper Booklet after completion of the exam.



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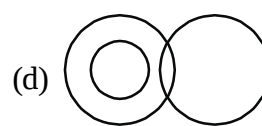
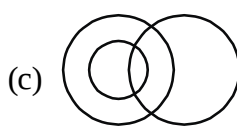
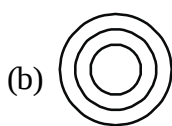
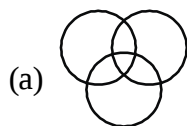


PAPER — I

- A right circular cone is exactly fitted inside a cube in such a way that the edges of the base of the cone are touching the edges of one of the faces of the cube and the vertex is on the opposite face of the cube. If the volume of the cube is 343 cc, what, approximately, is the volume of the cone ?
(a) 85 cc (b) 90 cc (c) 95 cc (d) 100 cc
- What is the least multiple of 7, which when divided by 2, 3, 4, 5 and 6, leaves the remainders 1, 2, 3, 4, 5 respectively?
(a) 179 (b) 59 (c) 61 (d) 119
- A man spends 80% of his earning. His income is increased by 20% and his expenses by 10%. By what % are his saving increased ?
(a) 60 % (b) 65 % (c) 40 % (d) 30 %
- A run $1\frac{2}{3}$ times as fast as B. If A gives B a start of 82 m, how far must the winning post be so that A and B might reach it at the same time?
(a) 200 m (b) 300 m (c) 270 m (d) 160 m
- In how many different ways can the letters of the word 'SOFTWARE' be arranged in such a way that the vowels always come together?
(a) 120 (b) 360 (c) 1440 (d) 720
- A, B, C, D, E, F, G, H are sitting in a circular table facing the centre, if C sits third to the left of A and D is second to the right of C. F is between A and E. B is third to the left of F. Two persons are sitting between B and H. Who sits second to the right of G ?
(a) B (b) A (c) D (d) E
- In the question below a series of number is given only one number is wrong in each series. Find out that wrong number, and taking this wrong number as the first term of the second series formed following the same logic, find out the third term of the second series ?

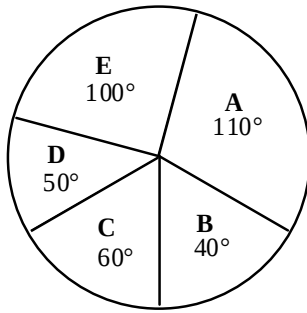
2	7	28	146	877	6140
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(a) 242 (b) 246 (c) 252 (d) 341
- A person goes into the house M who is the neighbour of V who has a daughter N. S is the father of A and is married to E. Whose sister is V. How is V related to A ?
(a) Son (b) Brother (c) Nephew (d) Grand-son
- CAT is coded as B1S, and MICE is coded as L3B2, then what will be the code for STATION ?
(a) TR1S34N (b) SR1S34M (c) RS1S34M (d) RS1S43N
- Which should be the ideal venn diagram for mothers, women, teachers ?



Common Data Questions for Q.11 To Q.15:

Below is given a pie chart which shows the annual income distribution of five forms namely A, B, C, D, E. The table chart shows the percentage expenditure of the forms in different fields. Based on the information provided you have to find out the answer of the question below:

Income distribution of five farms:**Expenses in different field for five farms:**

Farm	Salary of employee	Rent	Interest payment	Other
A	25	10	30	35
B	20	15	40	25
C	25	20	28	27
D	10	15	25	50
E	20	10	35	35

11. If total income of all the farms together is Rs. 72,00,000 then what percentage of total expenditure of all the farms is spent by farm C as rent ?
 (a) 5 (b) 2.5 (c) 3.5 (d) 3.33
12. By how much percentage the interest paid by farm B is less than the other expenditure of farm D?
 (a) 20 (b) 36 (c) 16 (d) 40
13. What is the expenditure of farm A in interest payment?
 (a) 6,60,000 (b) 5,20,000 (c) 3,30,000 (d) 4,40,000
14. Expenditure of farm C is what percentage of total expenditure of all the farms ?
 (a) 16.66 (b) 20 (c) 25 (d) 11
15. Expenditure of farm E in rent is what percentage of the expenditure of farm C in employee's salary ?
 (a) 20 (b) 30 (c) 40 (d) 35
16. A statistical technique used for large number of variables to establish whether there is tendency of group to be interrupt is:
 (a) Sample correlation (b) Multiple correlation (c) Factor analysis (d) None of these
17. Identify the correct statements with regards to research process.
 (i) Sample is selected before besiding data collection instrument development.
 (ii) Hypothesis testing is a part of data processing and analysing.
 (iii) _____ and schedules are data collecting methods.
 (iv) Formulating hypothesis is not necessary before selecting samples
 (a) (ii) and (iii) only (b) (i) and (ii) only (c) (iii) and (iv) only (d) (iii) and (i) only
18. Identify the correct statements
 (i) Refractive level of teaching is highest level of teaching.
 (ii) Simulation means creating conditions that are quite similar to actual conditions. Then traning under that condition.
 (iii) Adult learners are future oriented while your learners are result oriendted.
 (iv) Parental expectations always pur pressure on students.
 (a) (i) and (iii) only (b) (i), (ii) and (iii) (c) (i), (ii), (iii), and (iv) (d) (ii) and (iv)
19. Match **Column A** representing their main proponents in **Column B**
- | | |
|---|--|
| Column A
(I) Wardha education system
(II) Experimental learning
(III) Nature is the only teacher
(IV) Kindergarten education
(a) (I)-(d), (II)-(c), (III)-(b), (IV)-(a)
(c) (I)-(a), (II)-(c), (III)-(b), (IV)-(d) | Column B
(a) John downey
(b) Mahatma Gandhi
(c) Forest
(d) Rousseau
(b) (I)-(b), (II)-(a), (III)-(d), (IV)-(c)
(d) (I)-(a), (II)-(b), (III)-(c), (IV)-(d) |
|---|--|

20. Identify the correct statements.
 (i) Large group methods of teaching is students centric
 (ii) Small group methods of teaching involves case study, group discussion, role play etc.
 (iii) Individual 3rd method of study involves tutorials, assignment case study etc.
 (iv) Brainstorming and group discussion are same method.
 (a) (ii) and (iii) (b) (i) and (iii) (c) (iii) and (iv) (d) (i) and (iv)
21. A time ground testing programme for student should be implemented in schools so that
 (a) Progress of students should be informed to their parents.
 (b) A regular practice can be carried out.
 (c) The students can be trained for final exam
 (d) The remedial programme can be adopted on the basis of feedback.
22. When a person listens and attempts to understand the other person's viewpoint, it can be termed as.
 (a) Active listening (b) Empathic listening (c) Critical listening (d) None of these
23. When a research problem is related to heterogeneous population the most suitable method is
 (a) Cluster sampling (b) Stratified sampling
 (c) Convenient sampling (d) Lottery method
24. The problem of resender seeing only what they expect to see is called.
 (a) Researcher bias (b) Experimenter bias (c) Leniency effect (d) Halo effect
25. Match the items of Column A with items of Column B.
- | Column A | Column B |
|---|--|
| (i) Objectivity in research | (1) Finds cause and effect |
| (ii) Experimental research | (2) Means it is without any bias. |
| (iii) Applied research | (3) This is inductive research |
| (iv) Qualitative research | (4) Done to solve specific practical question. |
| (a) (i)-(1),(ii)-(2),(iii)-(3),(iv)-(4) | (b) (i)-(4),(ii)-(3),(iii)-(2),(iv)-(1) |
| (c) (i)-(2),(ii)-(1),(iii)-(4),(iv)-(3) | (d) (i)-(3),(ii)-(4),(iii)-(1),(iv)-(2) |

Read the following passage carefully and answer the questions — 26 to 30:

A country under foreign domination seeks escape from the present in dreams of a vanished age, and finds consolation in visions of past greatness. That is a foolish and dangerous pastime in which many of us indulge. An equally questionable practice for us in India is to imagine that we are still spiritually great though we have come down, in the world in other respects. Spiritual or any other greatness cannot be founded on lack of freedom and opportunity, or on starvation and misery. Many western writers have encouraged that notion that Indians are other-worldly. I suppose the poor and unfortunate in every country become to some extent other-worldly, unless they become revolutionaries, for this world is evidently not meant for them. So also the subject people.

As a man grows to maturity he is not entirely engrossed in, or satisfied with, the external objective world. He seeks also some inner meaning, some psychological and physical satisfactions. So also with peoples and civilizations as they mature and grow adult. Every civilization and every people exhibit these parallel streams of an external life and an internal life. Where they meet or keep close to each other, there is an equilibrium and stability. When they diverge conflict arises and the crises that torture the mind and spirit.

26. The passage mentions that "this world is evidently not meant for them". It refers to people who
 (a) seek freedom from foreign domination
 (b) live in starvation and misery.
 (c) become revolutionaries .
 (d) All of the above.

27. Which of the following can be taken as the most valid assumption of the paragraph?
 (a) A country under foreign domination cannot indulge in spiritual pursuit.
 (b) Poverty is an impediment in suitable pursuit
 (c) Both (a) and (b)
 (b) None of the above
28. Which of the following can be considered as the main theme of the paragraph?
 (a) The state of mind of oppressed people
 (b) Starvation and misery
 (c) The growth of civilization
 (d) Body, mind and spirit of people in general
29. According to the passage, the torture of the mind and spirit is caused.
 (a) By the ruthlessness of foreign domination
 (b) By the desire to escape from foreign domination and find consolation in visions of past greatness
 (c) by the desire to become either otherworldly or revolutionary
 (d) Due to lack of equilibrium between an external life and an internal life.
30. As a person grows in maturity, she/he seeks satisfaction in
 (a) Psychological satisfaction only
 (b) Physical satisfaction only
 (c) both psychological and physical satisfaction
 (d) Neither (a) nor (b)
31. Two-way communication becomes effective
 (a) Never (b) Always (c) Rarely (d) None of the above
32. In communication, chatting in internet is
 (a) Verbal communication (b) Non-verbal communication
 (c) Parallel communication (d) Grapevine communication
33. The most powerful barrier of communication in the class is
 (a) Noise in the classroom (b) Confusion on the part of teacher
 (c) More outside disturbance in the classroom (d) Lack of teaching aids
34. Which of the following are the main constituents of paralanguage?
 (I) Tone (II) Pitch (III) Quality of voice (IV) Rate of speaking
 (a) I, II and III (b) II, III and III (c) I, II and IV (d) I, II and IV
35. A person has a very advanced sense of what is socially appropriate and always knows what to say in every social context. The person has which kind of linguistic competence?
 (a) Phonemic (b) Cognitive (c) Syntactic (d) Pragmatic
36. What is Binary form of the 128.5?
 (a) 10000001.10 (b) 10000000.01 (c) 10000000.10 (d) 10000001.10
37. Which of the following not a programming languages?
 (a) LISP (b) PASCAL (c) PYTHON (d) COMSOL
38. Which of the following Biggest cloud computing environment?
 (a) Google (b) Facebook (c) Twitter (d) Amazon
39. To displaytime which technology used in web browser?
 (a) HTML (b) CSS (c) XML (d) JSP

40. Match the following

List A	List B
I. Mega Byte (MB)	A. 2^{20}
II. Giga Byte (GB)	B. 2^{30}
III. Tera Byte (TB)	C. 2^{40}
IV. Peta Byte (PB)	D. 2^{50}

Code:

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

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

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

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

41. First rank university in India according to NIRF 2019.

(a) JNU

(b) BHU

(c) IISc. (Bangalore)

(d) None of these

42. In the analysis of man-environment relationship pragmatic possibilism implies that

(a) There is no limit for man to exploit the resources of Earth.

(b) There are limited possibilities to explore the Earth's resources.

(c) The man has to watch and access the situation and then go ahead with resource utilization.

(d) The man has to keep in mind only his basic needs while planning to harness the potential of resourceful Earth.

43. Which of the following best illustrates a secondary air pollutant ?

(a) CO_2 released from the burning of coal.

(b) NO_2 released from the burning of oil.

(c) Ozone produced in photochemical smog.

(d) None of the above.

44. Malaria is caused by

(a) Bacterial infection

(b) Viral infection

(c) Parasitic infection

(d) Fungal infection

45. The maximum emission of pollutants from fuel sources in India is caused by

(a) coal

(b) firewood

(c) refuse burning

(d) vegetable waste product

46. Which of the following is not a primary air pollutant ?

(a) Methane

(b) Sulphur dioxide

(c) Ozone

(d) Asbestos

47. Government established the University Grants Commission by an act of Parliament in the year ?

(a) 1980

(b) 1948

(c) 1950

(d) 1956

48. Match List-1 with List-2 and select the corresponding answer from the codes given below:

List-1

List-2

A. National Council of Rural Institutes

1. New Delhi

B. Indian Council of Historical Research

2. Hyderabad

C. Indian Council of Philosophical Research

3. Shimla

D. Indian Institute of Advanced Study

4. Bangalore

Codes:

(a) A-2, B-4, C-1, D-3

(b) A-2, B-4, C-3, D-1

(c) A-2, B-3, C-4, D-1

(d) A-2, B-1, C-4, D-3

49. Which of the following articles provides for the Fundamental Rights in our constitution ?

(a) Articles 13-36

(b) Articles 12-35

(c) Articles 15-39

(d) None of these

50. Lok Sabha can be dissolved before the expiry of its normal five-year term by

(a) The Prime Minister.

(b) The Speaker of Lok Sabha.

(c) The President on the recommendation of Prime Minister.

(d) None of the above.



PAPER — II

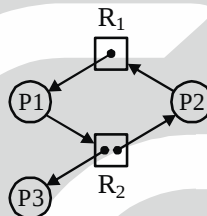
51. A process executes the following segment of code : fork (); fork(); fork(); fork(); fork();
The number of new processes created is:
(a) 2^5 (b) $2^5 - 1$ (c) $5(5+1) + 1$ (d) 5
52. A CPU generates 32-bit virtual addresses. The page size is 2 KB. The processor has a translation look-aside buffer (TLB) which can hold a total of 64 page table entries and is 2-way set associative. The minimum size of the TLB tag is:
(a) 14 bits (b) 15 bits (c) 16 bits (d) 17 bits
53. Consider the virtual page reference string 1, 1, 2, 4, 3, 2, 1, 2, 4, 7 on a demand paged virtual memory system running on a computer system that main memory size of 3 pages frames which are initially empty. Let LRU, FIFO and OPTIMAL denote the number of page faults under the corresponding page replacements policy. Then
(a) Optimal < LRU < FIFO (b) Optimal < FIFO < LRU
(c) Optimal = LRU (d) Optimal = FIFO
54. Consider the following statements:
I. First in First out might lead to starvation.
II. Shortest Job next might lead to starvation.
III. First in first out does not suffers from belady's anomaly
IV. Longest time first might lead to starvation.
V. If quantum of Round Robin is very large it behaves as FIFO
Which of the following statements are TRUE?
(a) Only I, II and V (b) Only II and III (c) Only I, IV and V (d) Only II, IV and V
55. An operating system uses Shortest Remaining Time first (SRT) process scheduling algorithm. Consider the arrival times and execution times for the following processes:
- | Process | Execution time | Arrival time |
|---------|----------------|--------------|
| P1 | 20 | 0 |
| P2 | 25 | 15 |
| P3 | 10 | 30 |
| P4 | 15 | 45 |
- What is the average waiting time for process P2 and P4?
(a) 25 (b) 12.5 (c) 30 (d) 15
56. Match the following:
- | | |
|---|---|
| <p>List-1</p> <p>P. RAID 0</p> <p>Q. RAID 1</p> <p>R. RAID 2</p> <p>S. RAID 3</p> <p>Codes:</p> <p>(a) P-4, Q-1, R-2, S-3</p> <p>(c) P-3, Q-1, R-4, S-2</p> | <p>List-2</p> <p>1. Bit interleaved parity</p> <p>2. Non-redundant stripping</p> <p>3. Mirrored disks</p> <p>4. Error correcting codes</p> <p>(b) P-2, Q-3, R-4, S-1</p> <p>(d) None of these</p> |
|---|---|
57. Which unix linux command is used to make all files and sub-directories in the directory "Progs" executable by all users ?
(a) Chmod – Ra + xprogs (b) Chmod – R222 progs
(b) Chmod – Xa + x progs (d) Chmod – X222 progs
58. A process which has just terminated but still has an entry in the table is called ____.
(a) A suspended process (b) A zombie process
(c) A blocked process (d) A terminated process

59. Consider the methods used by processes P0 and P1 for accessing their critical sections whenever needed as given below. The initial values of shared Boolean variables S0 and S1 are randomly assigned.

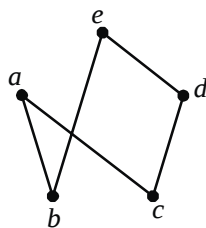
P0	P1
<pre>while (1) { Flag[0] = T while (Flag[1]); critical section Flag[0] = F }</pre>	<pre>while (1) { Flag[1] = T while (Flag[0]); critical section Flag[1] = F }</pre>

Which one of the following statements:

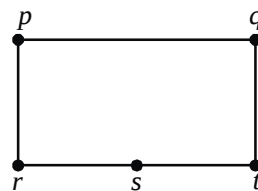
- (i) Mutual exclusion but not progress.
(ii) Progress but not mutual exclusion.
(iii) Both mutual exclusion and progress.
(a) (i) only (b) (ii) only (c) (iii) only (d) None of these
60. Consider the following resource allocation graph:



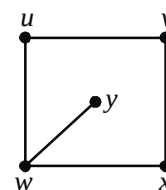
- (a) Deadlock occur (b) Deadlock never occur
(c) Can not be decided (d) None of the above
61. Which one of the following property needs to be satisfied in a group to form an abelian group?
(a) Existence of inverse (b) Existence of identity
(c) Commutativity (d) Associativity
62. Consider the binary relation $R = \{(a, b), (a, c), (c, a), (c, b), (b, a)\}$ on the set $\{a, b, c\}$. Which one of the following is TRUE?
(a) R is symmetric but not antisymmetric (b) R is Not symmetric but is antisymmetric
(c) R is both symmetric and antisymmetric (d) R is neither symmetric nor antisymmetric
63. Let 'G' be a connected planar graph with 20 vertices and the degree of each vertex is 3. Find the number of regions in the graph.
(a) 13 (b) 14 (c) 11 (d) 12
64. Consider the images:



G1



G2

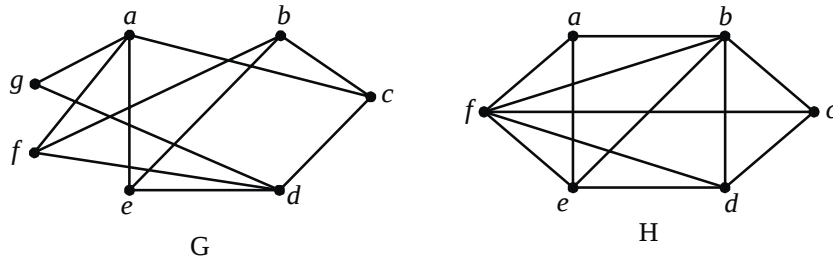


G3

Which of the following are isomorphic to each other?

- (a) Only G2 and G3 (b) Only G1 and G3 (c) Only G1 and G2 (d) Only G1, G2 and G3

65. "You cannot ride the roller coaster if you are under 4 feet tall unless you are older than 16 years old." The sentence best can be translated in terms of q , r and s as:
 (a) $(r \wedge \neg s) \rightarrow \neg q$ (b) $(r \wedge s) \rightarrow \neg q$ (c) $(r \vee \neg s) \rightarrow \neg q$ (d) $(r \vee s) \rightarrow \neg q$
66. There are ____ numbers of relations possible on a set with n elements.
 (a) 2^{2^n} (b) $n(n+1)/2$ (c) 2^{n^2} (d) 2^{n^n}
67. A playoff between two teams consists of at most five games. The first team that wins three games wins the playoff. In how many different ways can the playoff occur?
 (a) 18 (b) 20 (c) 21 (d) 22
68. Consider the two graphs:



Which of the following statements are TRUE?

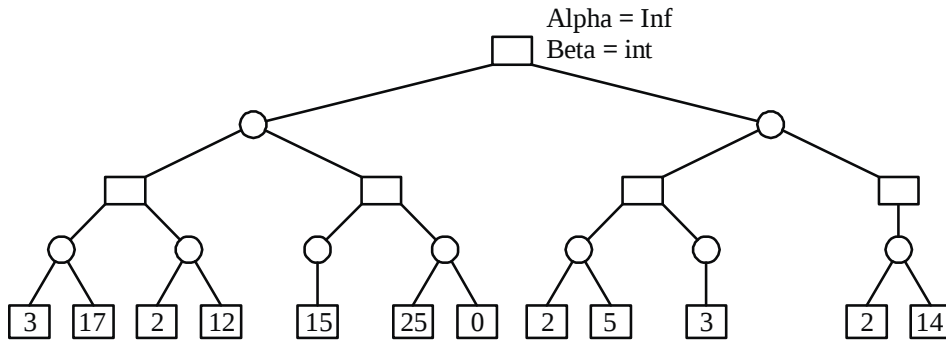
- (a) G and H both are bipartite (b) Only G is bipartite
 (c) Only H is bipartite (d) None is bipartite
69. If from a pack of 52 playing cards one card is drawn at random what is the probability that it is either a king or queen?
 (a) $1/13$ (b) $4/13$ (c) $2/13$ (d) $2/13$
70. If the binary operator $*$ is defined on a set ordered pairs of real number as $(a, b) * (c, d) = (ab + bc, bd)$ and is associative then $(1, 2) * (3, 5) * (3, 4)$ is equal to
 (a) $(74, 40)$ (b) $(120, 40)$ (c) $(23, 11)$ (d) $(7, 11)$
71. Consider the full joint distribution table:

	Toothache		$\neg$ Toothache	
	Catch	$\neg$ Catch	Catch	$\neg$ Catch
Cavity	0.108	0.012	0.072	0.008
$\neg$ Cavity	0.016	0.064	0.144	0.576

What is the $P(\text{cavity} | \text{toothache})$ and $P(\text{not toothache} | \text{cavity})$

- (a) 0.6, 0.26 (b) 0.4, 0.40 (c) 0.8, 0.29 (d) 0.5, 0.56
72. Consider the following statements:
 S1: For every node n if $h_1(n) \geq h_2(n)$, then A^* with $h_1(n)$ always expands less nodes than A^* with $h_2(n)$.
 S3: If temperature T in simulated annealing is always 0, Then it behaves like Hill climbing algorithm.
 S4: A^* always selects the node on the frontier with lowest estimated total distance.
 Which of the above is/are correct?
 (a) S1, S4 only (b) S1, S3, S4 only (c) S2, S3, S4 only (d) S1, S2, S3, S4
73. Let h be a admissible heuristic function and let $f(n) = wg(n) + (1-w)h(n)$, $0 \leq w \leq 1$. A^* algorithm with f will produce an optimal solution if $w =$
 (a) $1/4$ (b) $1/2$ (c) $3/4$ (d) Both (b) and (c)

74. Consider the following minimax tree



What is the value of the game using minimax search?

- (a) 3 (b) 2 (c) 15 (d) 0

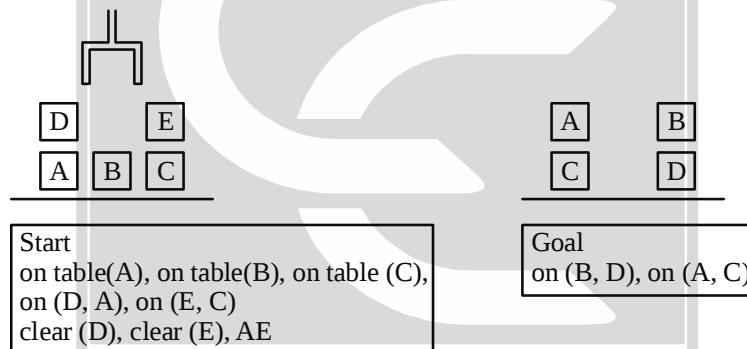
75. Consider the following substitutions:

$$\theta_1 = \left\{ \frac{f(a)}{x}, \frac{g(b,z)}{y}, \frac{x}{z} \right\}, \text{ and } \theta_2 = \left\{ \frac{f(a)}{x}, \frac{h(z)}{y}, \frac{w}{z} \right\}$$

What is the value of $\theta_1 \circ \theta_2$?

- (a) $\left\{ \frac{f(a)}{x}, \frac{g(b,a)}{y}, \frac{x}{z} \right\}$ (b) $\left\{ \frac{f(a)}{x}, \frac{g(a,b)}{y}, \frac{w}{z} \right\}$
 (c) $\left\{ \frac{f(a)}{x}, \frac{g(b,a)}{z}, \frac{w}{y} \right\}$ (d) $\left\{ \frac{f(a)}{x}, \frac{g(b,w)}{y}, \frac{w}{z} \right\}$

76. Consider the following block world problem:



Which of the following actions appears in the first action layer of planning graph.

- (a) Pickup(A), Pickup(E) (b) Stack(B,D), Unstack(A,C)
 (c) Pickup(B), Unstack(D, A) (d) Pickup(B), Unstack(D, A), Unstack(A,C)

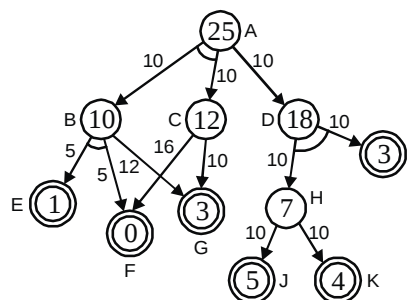
77. Find the normalized transformation that maps a window whose lower left corner is at (1, 1) and upper right corner is at (3, 5) onto a view port that has lower left corner at (0, 0) and upper right corner at (1/2, 1/2)

- (a) $\begin{pmatrix} 1/4 & 0 & -1/4 \\ 0 & 1/8 & -1/8 \\ 0 & 0 & 1 \end{pmatrix}$ (b) $\begin{pmatrix} -1/4 & 0 & -1/4 \\ 0 & 1/8 & -1/8 \\ 0 & 0 & 1 \end{pmatrix}$
 (c) $\begin{pmatrix} 1/4 & 0 & -1/4 \\ 0 & 1/8 & 1/8 \\ 0 & 0 & 1 \end{pmatrix}$ (d) $\begin{pmatrix} 1/4 & 0 & 1/4 \\ 0 & 1/8 & -1/8 \\ 0 & 0 & 1 \end{pmatrix}$

78. Apply the cohen sutherland algorithm to clip the line P(70,20) to Q(100,10) against a window whose LLC is at (50,10) and URC is at (80, 40). Which of the following is TRUE?

- (a) The portion of the line which is inside the window is from (70,20) to (60, 16.66).
 (b) The portion of the line which is inside the window is from (1000,10) to (80, 16.66).
 (c) The portion of the line which is inside the window is from (70,20) to (80, 16.66).
 (d) The line is completely outside the window.

79. Consider the three points A(3, 6, 4), B(2, 5, 5), C(0, 3, 7) and the view point is V(1,4,6). Choose the correct option?
 (a) C hides A and B if viewed from V (b) C hides A but not B if viewed from V
 (c) A hides B but not C if viewed from V (d) B hides A but not C if viewed from V
80. Which of the following is true for bezier curve?
 (a) m order bezier curve uses $m + 1$ control points
 (b) Bezier curve is invariant to any transformations.
 (c) Bezier curve completely lies inside the characteristic polygon
 (d) All of the above
81. Which of the following is true regarding B-Spline curve?
 (a) It supports the local control on the curve.
 (b) The degree of the curve is independent of number of control points.
 (c) B spline curves are approximation curve.
 (d) All of the above.
82. If during the maintenance of the software 100 modules are added, 50 modules are deleted and 50 modules are changed. If total number of modules are 1000. Then compute software maturity Index(SMI)?
 (a) 0.9 (b) 0.8 (c) 0.7 (d) None of these
83. If in a given software system number of seeded errors found are 60. The total number error and 600. If total number of errors in the software system are 4000. Then what is number of remaining errors during the software testing process?
 (a) 3400 (b) 3500 (c) 36000 (d) 3800
84. If number of processors in given system are 100. If the sequential part of the given program is 40%. Then compute the speedup and efficiency as of the given parallel system
 (a) 2.46, 0.2 (b) 3.4, 0.02 (c) 2.46, 0.02 (d) 2.46, 0.18
85. Which of the following is/are True?
 P. Cohesion should be high and coupling should be low.
 Q. Cohesion should be low and coupling should be high.
 R. High FAN IN and low FAN OUT are desirable.
 S. Zero level DFD is the context diagram
 (a) P,Q,R (b) P,Q,S (c) P,R,S (d) All of these
86. Match the following
- | Group A | Group B |
|--------------------------|-------------------------------------|
| (P) Unit testing | (1) We are developing product right |
| (Q) Integration Testing | (2) Finding coding errors |
| (R) Validation Testing | (3) Finding design Errors |
| (S) Verification Testing | (4) We are developing right product |
| (a) P-1, Q-3, R-2, S-4 | (b) P-2, Q-4, R-3, S-1 |
| (c) P-2, Q-3, R-4, S-1 | (d) P-4, Q-3, R-2, S-1 |
87. Consider the following AO* graph:



What is the value of root node for the value of optimal solution?

- (a) 45 (b) 57 (c) 47 (d) 44

88. Compute Cyclomatic complexity of the following code

Algorithm 1 Euclids algorithm

```

1. procedure EUCLID (a, b)  ▷ The g.c.d. of a and b
2.   r ← a mod b
3.   while r ≠ 0 do          ▷ We have the answer if r is 0
4.     a ← b
5.     b ← r
6.     r ← a mod b
7.   end while
8.   return b                ▷ The gcd is b
9.   go to 3
10 end procedure

```

(a) 4 (b) 5 (c) 6 (d) None of these

89. Given that the test team runs test cases for 8 CPU hr and identifies 20 failures. The effort required per hr of execution time is 6 person hr. Each failure requires 2 hr on average to verify and determine its nature. The test team consists of 2 members. What is the total failure identification effort required and elapsed calendar time?

(a) 5,0.3 (b) 4,0.3 (c) 4,0.5 (d) None of these

90. Organize the following steps to form Software Engineering Process Model.

(1) Test (2) Design (3) Install (4) Specification

(5) Manufacture (6) Maintain

(a) 2, 4, 5, 1, 6, 3 (b) 4, 2, 5, 1, 3, 6 (c) 2, 4, 5, 1, 3, 6 (d) 4, 2, 5, 1, 6, 3

91. Problems with using Lines of Code to measure the size of a product include(s)

(I) The creation of source code is only part of the development effort

(II) The Lines of Code (LOC) will differ between languages and cannot be measured for some languages

(III) Should comments, data definitions etc (i.e. non-executable LOC) be included as well?

(IV) The final size (kLOC) can only be determined once the product is delivered

(a) I,II,III (b) I,II,IV (c) I,III,IV (d) All of these

92. You are taking over a project during the planning process group and discover that six individuals have signed the project charter. Which of the following should most concern you?

1. Who will be a member of the change control board

2. Spending more time on configuration management

3. Getting a single project sponsor

4. Determining the reporting structure

(a) 1, 4, (b) 2,3 (c) 1,3, 4 (d) none of these

93. If the CIDR representation 100.1.2.35 / 20 then what are total number IP Addresses in the CIDR block?

(a) 4000 (b) 4090 (c) 4096 (d) None of these

94. What are the SQNR if the signal power is twice and 1,000,000 times the quantisation noise power?

(a) 3 and 50 (b) 4 and 60 (c) 3 and 60 (d) None of these

95. Match the following terms to their implications:

Group 1

(I) Twisted pair

(II) Coaxial cable

(III) Fiber-optic

(IV) Wireless/radio

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

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

Group 2

(A) Medium cost, LANs, 600-2,500 feet

(B) High cost, network backbones and WANS, up to 25 miles

(C) High cost, connects things that move, variable distances possible

(D) Medium cost, LANs, line-of-sight up to 1,000 feet

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

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



96. What is minimum frame size required for a CSMA/CD protocol running at 1 Gbps on a 300m cable with a link speed of 3×10^8 m/s and jamming signal is 48 bits
 (a) 250 bytes (b) 300 bytes (c) 400 bytes (d) None of these
97. If data word is 10011010. Create the data word, leaving spaces for the parity bits:
 _ _ 1 _ 0 0 1 _ 1 0 1 0. By using hamming coding calculate code word.
 (a) 011100101100 (b) 011100101110 (c) 011100101011 (d) 011100101010
98. Which of the following function of a translating bridge is/are
 1. Translate the network addresses into a layer 2 address.
 2. Connect similar local LANs.
 3. Connect different types of LANs.
 (a) 1 and 2 (b) 3 only (c) 2 and 3 (d) None of these
99. Match the following :
 List-I
 (i) Ethernet
 (ii) Token Ring
 (iii) Cut-through switch
 (iv) Spanning tree
 Codes:
 (a) i – d, ii – a, iii – b, iv – c
 (c) i – d, ii – d, iii – c, iv – b
 List-I
 (a) Deterministic
 (b) Utilize the full wire speed
 (c) Prevent looping
 (d) Checking valid address
 (b) i – a, ii – d, iii – b, iv – c
 (d) i – d, ii – c, iii – b, iv – a
100. What is the frequency band allocated for the downlink in GSM ?
 (a) 960-985 MHz (b) 935-960 MHz (c) 920-945 MHz (d) 930-955 MHz
101. Encrypt HELLOWORLD using caesar cipher with shift key 5 ?
 (a) MIQQUCQWQJ (b) MJQQUCPWQJ (c) MJQQUCQWQJ (d) None of these
102. Match the following :
 List-I
 1. SaaS
 2. PaaS
 3. IaaS
 4. Hypervisor
 (a) 1-P, 2-Q, 3-R, 4-S
 (c) 1-P, 2-Q, 3-S, 4-R
 List-I
 P. Software as service
 Q. Platform as service
 R. Amazon EC2
 S. Interface between cloud and hardware
 (b) 1-Q, 2-P, 3-R, 4-S
 (d) 1-S, 2-Q, 3-R, 4-P
103. What is alpha cut of given relation? If $\alpha = 0.6$

$$R = \begin{bmatrix} x_1 & y_1 & y_2 & y_3 & y_4 & y_5 \\ x_2 & 0.5 & 0.8 & 0.9 & 1 & 0.6 \\ x_3 & 0.7 & 0.8 & 0.6 & 0.9 & 0.7 \\ & 0.9 & 0.7 & 0.8 & 0.7 & 0.8 \end{bmatrix}$$

- (a) $\begin{bmatrix} 0 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 1 & 1 & 1 & 1 & 1 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 0 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \end{bmatrix}$ (d) None of these

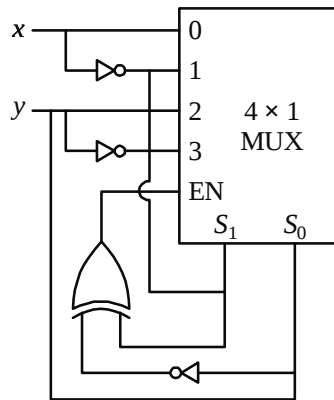
104. If the input vector is $[1, 2, 3, 4]$ and weight vector is $[1, -0.5, 2, -1.5]$, if threshold (Q) is zero and activation function is the just twice of the net input. Then compute the output of the neuron ?
 (a) 0.5 (b) 1 (c) -0.5 (d) 0
105. Which of the following is/are TRUE ?
 1. Jumping gene is a type of mutation.
 2. GA is supervised learning.
 3. Self organizing MAP is unsupervised learning.
 4. Logistic variable is part of artificial neural network.
 (a) 1, 2 and 3 (b) 1, 2 and 4 (c) 1, 3 and 4 (d) All of these
106. In a CPM/PERT network, an event refers to
 (a) the occurrence of a delay in the project
 (b) an activity inserted into the network to show a precedence relationship with no passage of time
 (c) the beginning or completion of an activity or project
 (d) the earliest an activity can start
107. Four persons A,B,C and D are to be assigned four jobs I,II,III and IV. The cost matrix is given as under, find proper assignment.

Man → Jobs ↓	A	B	C	D
I	8	10	17	9
II	3	8	5	6
III	10	12	11	9
IV	6	13	9	7

What is total cost using Hungarian Method?

- (a) 30 (b) 31 (c) 32 (d) None of these
108. 11001, 1001 and 111001 correspond to the 2's complement representation of which one of the following sets of number ?
 (a) $-25, -9, -57$ (b) $-7, -7, -7$ (c) $-9, -1, -25$ (d) $-6, -6, -6$
109. The number of essential prime implicants in $f(x_1, x_2, x_3)$ defined below is
- x_1 _____
- x_2 _____
- x_3 _____
- f _____
- (a) 2 (b) 3 (c) 4 (d) 5
110. Which of the following must always be TRUE, if $x_1 \oplus x_2 \oplus x_3 \oplus x_4 = 0$
 (a) $x_1 x_2 x_3 x_4 = 0$ (b) $x_1 x_3 + x_2 = 0$
 (c) $x_1 + x_2 + x_3 + x_4 = 0$ (d) $\bar{x}_1 \oplus \bar{x}_3 = \bar{x}_2 \oplus x_4$

111. Output of the following 4×1 MUX is



- (a) $x\bar{y}$ (b) xy (c) $\bar{x}y$ (d) $\bar{x}\bar{y}$

112. Speed-up of a system where cache can be used 90% of the time and is 10 times faster than main memory will be

- (a) 3 (b) 4.5 (c) 5 (d) 6.25

113. The control word of a microprogrammed control unit is as follows:

Condition	Control field	Next address
-----------	---------------	--------------

If it has to generate 46 control signals, next addresses are selected based on 8 conditional flag information and the control memory have 80 control program of each of 8 words size, then the size of control word in horizontal microprogrammed control unit will be

- (a) 16 bits (b) 26 bits (c) 56 bits (d) 59 bits

114. Match the following:

Column-1

Column-2

A. Indexed addressing mode

1. Writing relocatable code

B. Base register addressing mode

2. Array implementation

C. Indirect addressing mode

3. Passing array as parameter

- (a) A-3, B-1, C-2 (b) A-2, B-1, C-3 (c) A-1, B-3, C-2 (d) A-3, B-2, C-1

115. Consider a computer system with a 2-way set associative cache memory. The memory is byte addressable with the cache size of 8 KB, a block size of 256 bytes and having 1 MB main memory. While addressing the memory location AC701H by the CPU, the contents of the TAG field of the corresponding cache line is

- (a) 10101100 (b) 11000111 (c) 10100111 (d) 11001010

116. What is/are alternative terms for datamining?

- (a) Knowledge mining (b) Knowledge extraction
(c) Data Archaeology (d) All of these

117. Consider the relation Relation (ABCDEF) with FDs:

$A \rightarrow FC$

$C \rightarrow D$

$B \rightarrow E$

Find the key

- (a) AC (b) AB (c) BC (d) DC

118. If isolation level in transactions is set as “read committed”, then

- (I) Dirty reads are not allowed (II) Unrepeatable read are allowed
(a) Only (I) is correct (b) Only (II) is correct
(c) Both (I) and (II) are correct (d) Both (I) and (II) are incorrect

119. Consider the following set of functional dependencies on the relation (ABC) , $\{A \rightarrow B, AB \rightarrow C, A \rightarrow BC, B \rightarrow C\}$. Find the canonical cover for the above FD's set
- (a) $\{A \rightarrow BC, B \rightarrow C\}$ (b) $\{A \rightarrow BC, AB \rightarrow C\}$
 (c) $\{A \rightarrow BC, A \rightarrow B\}$ (d) $\{A \rightarrow B, B \rightarrow C\}$
120. Use the following tables for the below queries wherever table 1 and table 2 are used:

Table 1

T1A	T1B
a	aa
b	bb
c	cc

Table 2

T2A	T2B	T2C
a	a	a
b	a	null

Select*

From Table1

Where T1A = all (Select T2B

From Table2)

where T2B >= 'b')

How many number of rows will be there in the output?

- (a) 1 (b) 2 (c) 3 (d) 0
121. Database schema is given below:
 customer (customerId, name, phonenumber, address)
 account (accountNo, balance, branchName)
 Find out the phonenumber and address of the customer named by Aditya in relational algebra from the above database schema.

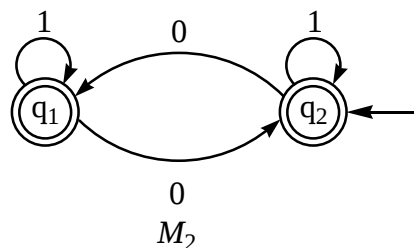
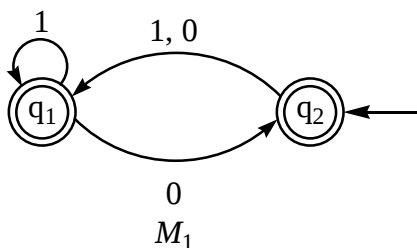
- (a) $\sigma_{\text{name}='Aditya'}(\Pi_{\text{name, phonenumber, address}}(\text{customer}))$
 (b) $\Pi_{\text{phonenumber, address}}(\sigma_{\text{name}='Aditya'}(\text{customer}))$
 (c) $\sigma_{\text{name}='Aditya'}(\Pi_{\text{phonenumber, address}}(\text{customer}))$
 (d) $\rho_{\text{phonenumber, name}}(\sigma_{\text{name}='Aditya'}(\text{customer}))$

122. Consider the following language

$$L_1 = \{a^p b^q a^r \mid p > 7, q > 5, r \leq q\}, \text{ and } L_2 = \{a^p b^q \mid p \geq 1, q \geq 1\} \cap \{a^p b^p \mid p \geq 1\}$$

Which of following statements is/are True?

- (a) L_1 is regular but L_2 is non regular (b) Both L_1 and L_2 are regular
 (c) Neither L_1 nor L_2 is regular (d) L_2 is regular L_1 is non-regular
123. How many min states are required to design a DFA accepting the string $\{01, 110\}$?
 (a) 4 (b) 5 (c) 6 (d) 7
124. Consider the following FA's



Which of the following is TRUE ?

- (a) $M_1 \subseteq M_2$ (b) $M_1 \supseteq M_2$ (c) $M_1 = M_2$ (d) $M_1 \subset M_2$

125. Consider the following regular expression:

$$R = (a + b)^* (aa + bb) (a + b)^*$$

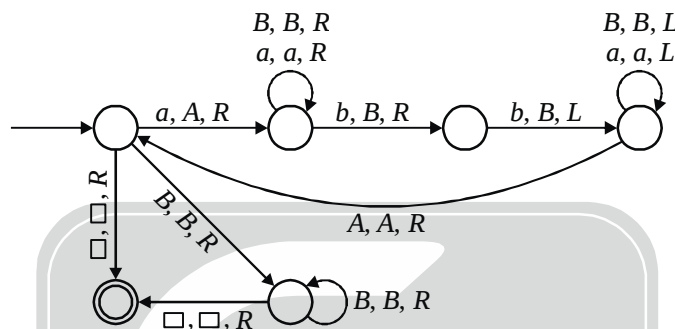
What will be the equivalent regular expression ?

- (a) $(a(ba)^* + b(ab)^*) (a + b)^*$
 (b) $(a(ba)^* + b(ab)^*)^* (a + b)^*$
 (c) $(a(ba)^* (a + bb) + b(ab)^* (b + aa)) (a + b)^*$
 (d) $(a(ba)^* (a + bb) + b(ab)^* (b + aa)) (a + b)^+$

126. The number of substrings that can be formed from string given by 'successful' is

- (a) 51 (b) 52 (c) 54 (d) 55

127. Identify the language accepted by turing machine.



Note : 'B' does not refer blank here.

- (a) $L = \{a^m b^n \mid m \leq n; m, n \geq 0\}$ (b) $L = \{a^m b^n \mid m < n; m, n \geq 0\}$
 (c) $L = \{a^m b^n \mid m = 2n; m, n \geq 0\}$ (d) $L = \{a^m b^n \mid 2m = n; m, n \geq 0\}$

128. The number of steps required for any string (s) of length m , and the grammar is in GNF and CNF form respectively.

- (a) $2n - 1$ and w (b) $\lceil \log_2^n \rceil + 1$ and $2n - 1$
 (c) $2^n - 1$ and n (d) n and $2n - 1$

129. Consider the following statement:

S_1 : Finiteness property of a CFL is decidable.

S_2 : The complement of a DCFL is DCFL.

Which of the following are TRUE ?

- (a) S_1 only (b) S_2 only (c) Both S_1 and S_2 (d) None of these

130. When searching for the value 16 in a BST nodes containing the key values 5, 7, 10, 11, 70, 80, 90, 99 are traversed, not necessarily in the order given. How many different orders are possible in which these key values can occur on the search path from the root to the node containing the value 16 ?

- (a) 64 (b) 70 (c) 32 (d) 38

131. Which is stack overflow condition to implement multiple stack in single array?

- (a) $i(M/N)$ (b) $i(M/N) - 1$ (c) $(i + 1)(M/N) - 1$ (d) None of these

(where N is number of stacks, M is size of array, and i represent required number of stack starting with 0)

132. Find the value of postfix expression: $2\ 3\ 1\ * + 6\ 2\ / -$

- (a) 1 (b) 2 (c) 3 (d) 4



133. Reverse polish notation of a expression tree is: $4\ 5\ *\ 6\ -\ 3\ \wedge\ 7\ 8\ *\ 2\ +\ -$.
Find inorder of the corresponding tree ?
- (a) $4 - 5 + 6 * 3 \wedge 7 - 8 * 2$ (b) $5 - 4 + 3 * 6 \wedge 8 - 7 + 2$
(c) $4 * 5 + 6 * 3 \wedge 7 - 8 - 2$ (d) $4 * 5 - 6 \wedge 3 - 7 * 8 + 2$

134. The operations that can be performed on the queue are:
- (i) Dequeue (Q) : Delete the element at the front of queue and returns its value.
(ii) Enqueue (Q) : Inserts the element x at the rear of queue.
(iii) Is empty (Q) : Returns true if the queue is empty otherwise false.

Consider the following program

```
void f(queue Q)
{
    int x;
    if (!is empty(Q))
    {
        x = delete (Q)
        f(Q);
        insert (Q, x)
    }
}
```

Now if queue is as follows:

Q [a b c d e f]

What will be the queue structure after performing the above function ?

- (a) [a b c d e f] (b) [f b c d e a] (c) [f e d c b a] (d) None of these
135. Consider the following program:
- ```
func(int n)
{
 if (n == 0)
 return (n)
 else
 {
 for (i = 1; i ≤ n; i++)
 return (func (i - 1) * func (i - 1))
 }
}
```

Find time complexity for above program ?

- (a)  $O((2n)^{n+1})$       (b)  $O((2n)^n)$       (c)  $O(2^n)$       (d)  $O(n)$
136. The number of ways in which the numbers 1, 2, 3, 4, 5 can be inserted in an empty BST, such that resulting tree has height 4, is
- (a) 8      (b) 16      (c) 18      (d) 32

137. Match the following:

List-1

- A. Tower of Hanoi  
B. Binary search  
C. Merge algo  
D. Factorial

- (a) A-1, B-4, C-2, D-3  
(c) A-2, B-1, C-4, D-3

List-2

1.  $2T(n/2) + n$   
2.  $2T(n-1) + c$   
3.  $T(n/2) + c$   
4.  $T(n-1) + c$   
(b) A-2, B-3, C-1, D-4  
(d) A-2, B-3, C-4, D-1

138. Which of the following sorting algorithm gives best comparison in worst case scnerio ?  
 (a) Quick sort                      (b) Heap sort                      (c) Insertion sort                      (d) Selection sort
139. Consider the following grammar:  
 $E \rightarrow E + T / T$   
 $T \rightarrow T * F / F$   
 $F \rightarrow (E) / id$   
 A string  $id + id * id$  is parsed using above grammar. Which of the following statements is/are correct ?  
 (a)  $E + F$  is a handle                      (b)  $T * F$  is a handle  
 (c)  $E + F *$  is a viable prefix                      (d) Both (b) and (c)
140. Consider the following program segment:  

```
void main ()
{
 int * a, b;
 a = 10;
 a = &b;
 printf ("%d%d%d", a, b,*a);
 b = /* something done above */b;
 printf ("%d", b);
}
```

 Number of tokens in above C code ?  
 (a) 44                      (b) 45                      (c) 48                      (d) 52
141. Match the following:  

|                                                                                                                     |                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| List-1<br>A. Static memory<br>B. Heap area of memory<br>C. Stack memory<br>(a) A-2, B-1, C-3      (b) A-3, B-1, C-2 | List-2<br>1. Temporary variable and return address<br>2. Dynamic variable<br>3. Local variable<br>(c) A-3, B-2, C-1      (d) A-1, B-2, C-3 |
|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
142. What will be the output of the following program?  

```
int main ()
{
 cout << "Career Endeavour";
 return 0;
}
```

 (a) Rutine error                      (b) Compilation error  
 (c) Career Endeavour                      (d) Career Endeavour ;;
143. Match the following w.r.t programming language:  

|                                                                                                                         |                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| List-I<br>(A) JAVA<br>(B) Python<br>(C) C<br>(D) Small talk<br>(a) A-iv, B-iii, C-ii, D-i<br>(c) A-iii, B-iv, C-ii, D-i | List-II<br>(i) Pure object oriented language<br>(ii) Procedural language<br>(iii) Statically object oriented language<br>(iv) Dynamically object oriented language<br>(b) A-i, B-iii, C-ii, D-iv<br>(d) A-iii, B-i, C-ii, D-iv |
|-------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

144. Consider the following C program

```
void main () {
 a = 0;
 for (i = 1, i ≤ n; i = i + 20)
 {
 for (j = n; j ≥ 10; j = j1/25)
 a = a + 1; } }
```

What is value of 'a' after completion of program ?

- (a)  $n \log_{25} \log_{10} n$     (b)  $n \log_{10} \log_{25} n$     (c)  $\frac{n}{20} \log_{10} \log_{25} n$     (d)  $\frac{n}{20} \log_{25} \log_{10} n$

145. Which of the following parameter passing mechanism(s) is/are supported by C++, but not by C ?

- (a) Pass by value    (b) Pass of reference  
(c) Pass by value-result    (d) All of these

146. Match the following:

List-1

- A. C  
B. Java  
C. HTML  
D. Python

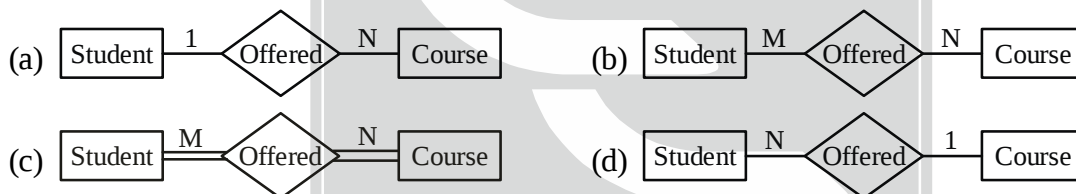
List-2

1. #comment  
2. /\*comment\*/  
3. //comment  
4. <!--comment-->

- (a) A-2, B-3, C-1, D-4    (b) A-3, B-2, C-4, D-1  
(c) A-2, B-3, C-4, D-1    (d) A-2, B-1, C-4, D-3

147. A student can take one or more courses and course can be offered to any number of students. Which of the following represents given scenario in ER model?

- (a) A student can take one or more courses and course can be offered to any number of students. Which of the following represents given scenario in ER model?



148. Match the following with most appropriate type of attributes.

- (P) Name of the dependent    (1) Stored attribute  
(Q) Degree of a person    (2) Composite attribute  
(R) Telephone number    (3) Multivalued attribute  
(S) Date of birth    (4) Discriminator attribute

**Codes:**

- (a) P - 4, Q - 3, R - 2, S - 1    (b) P - 4, Q - 2, R - 3, S - 1  
(c) P - 4, Q - 1, R - 2, S - 3    (d) P - 4, Q - 1, R - 3, S - 2

149. Consider a relation R (A,B,C,D,E) with FD

$A \rightarrow BCDE$

$BC \rightarrow ADE$

$D \rightarrow E$

The highest normal form achieved by R is

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

150. What is true about Thomas's write rule?

- (a) Thomas's write rule provides lesser concurrency than time stamp order protocol.  
(b) Thomas's write rule and time stamp order protocol provided same concurrency.  
(c) No comparison between Thomas's write rule time stamp order protocol.  
(d) Thomas's write rule provides greater concurrency than time stamp order protocol.





## NTA-UGC-NET-COMPUTER SCIENCE & APPLICATIONS

Date: 25-11-2019

Test Series-B

### ANSWER KEY

#### PAPER – I

|     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1.  | (*) | 2.  | (a) | 3.  | (b) | 4.  | (a) | 5.  | (a) |
| 6.  | (a) | 7.  | (d) | 8.  | (c) | 9.  | (c) | 10. | (c) |
| 11. | (d) | 12. | (b) | 13. | (a) | 14. | (a) | 15. | (c) |
| 16. | (c) | 17. | (a) | 18. | (a) | 19. | (b) | 20. | (a) |
| 21. | (d) | 22. | (b) | 23. | (b) | 24. | (a) | 25. | (c) |
| 26. | (b) | 27. | (b) | 28. | (a) | 29. | (d) | 30. | (d) |
| 31. | (b) | 32. | (a) | 33. | (b) | 34. | (d) | 35. | (d) |
| 36. | (a) | 37. | (d) | 38. | (b) | 39. | (d) | 40. | (d) |
| 41. | (c) | 42. | (c) | 43. | (c) | 44. | (c) | 45. | (c) |
| 46. | (c) | 47. | (d) | 48. | (a) | 49. | (b) | 50. | (c) |

#### PAPER – II

|      |     |      |     |      |     |      |     |      |     |
|------|-----|------|-----|------|-----|------|-----|------|-----|
| 51.  | (b) | 52.  | (c) | 53.  | (a) | 54.  | (d) | 55.  | (b) |
| 56.  | (b) | 57.  | (a) | 58.  | (b) | 59.  | (a) | 60.  | (b) |
| 61.  | (c) | 62.  | (a) | 63.  | (d) | 64.  | (c) | 65.  | (a) |
| 66.  | (c) | 67.  | (b) | 68.  | (b) | 69.  | (c) | 70.  | (b) |
| 71.  | (a) | 72.  | (c) | 73.  | (d) | 74.  | (a) | 75.  | (d) |
| 76.  | (c) | 77.  | (a) | 78.  | (c) | 79.  | (c) | 80.  | (d) |
| 81.  | (d) | 82.  | (b) | 83.  | (c) | 84.  | (c) | 85.  | (c) |
| 86.  | (c) | 87.  | (d) | 88.  | (b) | 89.  | (a) | 90.  | (c) |
| 91.  | (d) | 92.  | (d) | 93.  | (c) | 94.  | (c) | 95.  | (c) |
| 96.  | (d) | 97.  | (d) | 98.  | (c) | 99.  | (a) | 100. | (b) |
| 101. | (c) | 102. | (a) | 103. | (a) | 104. | (d) | 105. | (d) |
| 106. | (c) | 107. | (c) | 108. | (b) | 109. | (a) | 110. | (d) |
| 111. | (a) | 112. | (c) | 113. | (d) | 114. | (a) | 115. | (a) |
| 116. | (d) | 117. | (b) | 118. | (c) | 119. | (a) | 120. | (c) |
| 121. | (b) | 122. | (c) | 123. | (c) | 124. | (c) | 125. | (c) |
| 126. | (b) | 127. | (d) | 128. | (d) | 129. | (c) | 130. | (b) |
| 131. | (c) | 132. | (b) | 133. | (d) | 134. | (c) | 135. | (a) |
| 136. | (b) | 137. | (b) | 138. | (d) | 139. | (d) | 140. | (b) |
| 141. | (c) | 142. | (c) | 143. | (c) | 144. | (d) | 145. | (b) |
| 146. | (c) | 147. | (c) | 148. | (a) | 149. | (b) | 150. | (d) |

