

TEST SERIES UGC-NET/JRF DEC. 2018

BOOKLET SERIES **D**

Paper Code **87**

Test Type: **TEST SERIES**

COMPUTER SCIENCE & APPLICATIONS

Duration: 03:00 Hours

Date: 02-12-2018

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

1. Match the test skills.

(a) Comprehension	(i) understanding of facts and principles
(b) Knowledge	(ii) common terms, facts and principles
(c) Application	(iii) Solving problems applying concepts
(d) Analysis	(iv) recognition of unstated assumptions or logical fallacies
(a) a (i) b (ii) c. (iii) d (iv)	(b) a (iii) b (i) c (iv) d (iii)
(c) a (iii) b (iii) c (iv) d (iii)	(d) a (iv) b (iii) c (ii) d (i)
2. Education officers often speak of the tone of an institution. This concept of 'tone' refers to
 - (a) the disciplinary measures adopted by an institution for avoiding classes.
 - (b) the organizational and supervising set up the institution.
 - (c) the healthy atmosphere of the institution from the sentimental point of view.
 - (d) the programs and activities planned by the institution.
3. The skill of achieving closure helps teacher to:
 - (a) recapitulate the teaching points covered in the class
 - (b) assimilate the parts into meaningful whole
 - (c) quickly summarize an assignment
 - (d) all of the above
4. Micro teaching is a
 - (a) scaled down teaching encounter in class size and class time
 - (b) teacher education technique allowing teachers to apply clearly defined teaching skills
 - (c) is supported with video recording of lessons
 - (d) all of the above
5. In the video-recording technique, the sources of feedback are:
 - (1) self resource person, peer group
 - (2) video tape, LCD and observations schedule
 - (3) feedback from learners
 - (4) feedback during recording

(a) 1, 2, 3	(b) 1, 2, 4	(c) 2, 3, 4	(d) 1, 2
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6. What is a primary source of data?
 - (a) Oral testimony of traditions and customs
 - (b) Official records - governments' documents, information preserved by said - religious organizations etc.
 - (c) Personal records, letters, diaries, autobiographies, wills etc.
 - (d) All the above
7. Panel and cohort designs differ, in that:
 - (a) Cohort studies involve quantitative research, whereas panel studies are qualitative
 - (b) A panel study does not need rules to handle new entrants to households
 - (c) Only a cohort study will suffer from sample attrition
 - (d) A panel study can distinguish between age effects and cohort effects, but a cohort design can only detect ageing effects
8. Which of the following is an example of scientific knowledge ?

(a) laboratory and field experiments	(b) religious scriptures
(c) social traditions and informs	(d) authority of the prophet or great men.

9. What is the criteria for a good hypothesis?
 (a) It should be precise, specific and consistent with most known facts
 (b) It should be formulated in such a way that it can be tested by the data
 (c) It should be a limited scope and should not have too much significance
 (d) All the above
10. An important practical issue to consider when designing a research project is:
 (a) Which theoretical perspective you find most interesting
 (b) Whether or not you have time to retiling the bathroom first
 (c) How much time and money you have to conduct the research
 (d) Which colour of ring binder to present your work in

READ THE FOLLOWING PASSAGE AND ANSWER THE QUESTIONS:

Socrates taught that "The man who is master of himself is truly free". By being master of oneself, he meant, first knowing oneself, one's faults, weaknesses and one's good points without making any pretense and then being able to control oneself. This knowledge of himself is what helps a man to be courageous and the courageous man has a very important sort of freedom from fear. Socrates himself, because he was not afraid of the consequences, always felt free to teach what he thought was right. No wonder, all his pupils loved him very much. But he made some dangerous enemies by his strange ways of teaching and asking questions. Some of the rulers in Athens did not like people to be encouraged to ask questions, because they thought that people would begin to ask questions about what their rulers were doing. Therefore, they accused Socrates of teaching young men wicked things and leading them to throw off their religion. Finally, the great teacher Socrates was given death sentence. He was compelled to drink hemlock and pass away. However, his maxim know thyself still offers us the light of knowledge of ourselves.

11. Socrates by the phrase 'master of himself' wants to mean :
 (a) master of destiny
 (b) enlightened with the knowledge of oneself
 (c) one who defies others dominance
 (d) one who is self-sufficient
12. Socrates was courageous in the sense :
 (a) he was not afraid of danger
 (b) he was not afraid of enemy
 (c) he was not afraid of outcome
 (d) None of these
13. The accusation against Socrates was
 (a) blasphemy
 (b) wrongful teaching
 (c) inciting anger among youth
 (d) indirectly encouraging a rebellion against the kind
14. Hemlock is :
 (a) a poison
 (b) a medicine
 (c) a position
 (d) a broth
15. Which of the following person is known as 'Father of Indian Cinema'
 (a) Raj Kapoor
 (b) Dev Anand
 (c) Dada Saheb Phalke
 (d) Guru Dutt
16. The main purpose of evaluative listening is
 (a) to accept or reject an idea given to the listener
 (b) to evaluate the speaker's credibility and personality
 (c) both of above
 (d) either (a) or (b)

17. Which is the method used for receiving information in market based feedback system
 (a) Audience decision making (b) Media review
 (c) Direct feedback (d) All of these
18. What is “context”?
 (a) A physical and psychological environment for conversation
 (b) Verbal and nonverbal responses to messages
 (c) Effective communication
 (d) An interference with message reception
19. A message can only be deemed effective when it is
 (a) understood by others and produces the intended results.
 (b) delivered with confidence.
 (c) repeated back as proof of understanding.
 (d) communicated face-to-face.
20. A student helps a teacher to solve the problem while the teacher was delivering the lecture. He was
 (a) an emphatic listener (b) an evaluative listener
 (c) a realistic listener (d) an informational listener
21. If the statement “All students are brilliant” is false then which of the following is true
 (a) No Student is brilliant (b) No Brilliant is student
 (c) Some Students are brilliant (d) Some students are not brilliant
22. Based on the following statements, which is the correct conclusion drawn. Only gentlemen can become members of the club. Many of the members of the club are officers. Some of the officers have been invited for dinner.
 (a) All the members of the club have been invited for dinner
 (b) Some of the officers are not gentlemen
 (c) All gentlemen are members of the club
 (d) Only gentlemen have been invited for dinner

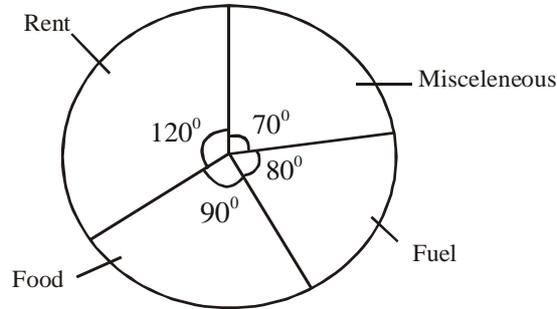
Directions (Q.23- 24) : Each of the following questions contains two statements followed by two conclusions numbered I and II. You have to consider the two statements to be true, even if they seem to be at variance at the commonly known facts. You have to decide which of the given conclusions definitely follows from the given statements.

Give answer : (a) if only I follows (b) if only conclusion II follows
 (c) if either I or II follows (d) if neither I nor II follows

23. Statement : 1. Some tables are glasses.
 2. All trees are tables.
 Conclusions: I. Some trees are glasses
 II. Some glasses are trees.
24. Statement : 1. No man is a lion.
 2. Somu is a man.
 Conclusions: I. Somu is not a lion.
 II. All men are not Somu.
25. Consider the following statements:
 All artists are whimsical.
 Some artists are drug addicts.
 Frustrated people are prone to become drug addicts.
 From the above three statements it may be concluded that
 (a) Artists are frustrated. (b) Some drug addicts are whimsical.
 (c) All frustrated people are drug addicts. (d) Whimsical people are generally frustrated.

26. Which of the options below best represents a persuasive definition for the term "profit."
- The return received on a business undertaking after all operating expenses.
 - An advantageous gain or benefit.
 - The money factory owners steal from their workers by keeping wages low.
 - A net gain.

Direction: Q.27-31 : Observe the pie chart given below and answer the following questions Monthly expenses of a family are Rs. 57,024. Amount spent on various needs is shown in the pie-chart



27. What amount was spent on food ?
- Rs. 12,672
 - Rs. 19,008
 - Rs. 14,256
 - Rs. 11,088
28. How much more is spent on rent than on fuel ?
- Rs. 7920
 - Rs. 6336
 - Rs. 5434
 - Rs. 5742
29. On what head is expense maximum ?
- Rent
 - Fuel
 - Food
 - Miscellaneous
30. Approximately what percent of family income is spent on food and fuel taken together?
- 45
 - 50
 - 52
 - 47
31. What is the ratio of expenses in food to that on rent ?
- 4 : 3
 - 3 : 4
 - 5 : 4
 - none of these
32. Function of putting data on the stack is
- Popping
 - Pushing
 - Setting
 - arranging
33. Which of the following is both an advantage and a disadvantage of cloud computing
- Accessibility
 - data sharing
 - storage
 - cost
34. Pick the odd one out
- IO.SYS
 - MSDOS.SYS
 - ROM- BIOS
 - COMMAND.COM
35. Which region of earth's covering helps in establishing long distance wireless communication?
- Stratosphere
 - Ionosphere
 - Biosphere
 - Atmosphere
36. What is qubits?
- an elementary particle used in super computer
 - an elementary particle used in quantum computers
 - an way of using binary in analog format
 - another name for binary numbers
37. Which of the following are the benefits of Ganga Vriksharopan Abhiyan?
- Forests cause higher rainfall and raise water level in the river basins. Through their foliage, abundant leaf litter and craggy bark, trees and forests decrease speed of water dispersion.
 - It favors slow but greater infiltration of rain water to ensure smooth functioning of hydrological cycle.

3. Presence of healthy forest cover along river provides self-cleaning ability to river.
4. Afforestation and augmentation of existing forest cover along Ganga River holds promise to strengthen riparian ecosystem thereby contributing to overarching cause of Ganga Rejuvenation.
- (a) 1, 2, 4 (b) 1, 2, 3 (c) 2, 3, 4 (d) 1, 2, 3, 4
38. What is geo- thermal energy?
- (a) Energy derived from stream
(b) Energy derived from coal
(c) Energy stored in dams
(d) Energy contained in hot- water deposits within the Earth's crust
39. Which of the following does not forms of a part of non- point pollution source?
- (a) Leakage (b) Wastes (c) Dumping (d) Sediment
40. Which of the following cyclones hit India in 2018?
- (a) Shanshan (b) Daye (c) Luban (d) Gaja
41. Which of the following is not true about "Ishan Uday"
- (a) It is open for all candidates enrolled in Indian Universities.
(b) The scholarship will be awarded in general degree courses, professional courses, technical courses, medical and paramedical courses (including MBBS, BAMS, BDS, B.Arch, BTech etc.)
(c) only those students who have passed Class XII (CBSE board) or equivalent Examination of State Boards of NER are eligible to apply
(d) only those candidates whose annual family income is not equal or more than Rs.4.5 lakh per annum are covered under ambit of the scheme.
42. Which of the following person administers the Union Territories?
- (a) The President through the Administrators appointed by him
(b) The governor
(c) The Law Minister, Government of India
(d) The Attorney - General of India
43. Directive Principles of State Policy aim at
- (a) ensuring individual liberty
(b) protecting the depressed classes
(c) providing social and economic base for genuine democracy in the country
(d) ensuring and strengthening the country's independence
44. Which of the following is/are an Apex body in Higher education in India?
1. All India Council of Technical Education (AICTE)
2. Council of Architecture (COA)
3. Indian Council of Historical Research (ICHR)
4. Indian Council of Philosophical Research (ICPR)
- (a) 1, 3, 4 (b) 1, 2, 3 (c) 2, 3, 4 (d) 1, 2, 3, 4
45. Consider the following statements about National emergency:
1. A revocation of emergency by President must be approved by the Parliament within one month.
2. The President must revoke a proclamation of emergency if the Parliament passes a resolution disapproving its continuation.
- Which of the statements given above is/are correct?
- (a) 1 only (b) 2 only (c) Both 1 and 2 (d) Neither 1 nor 2

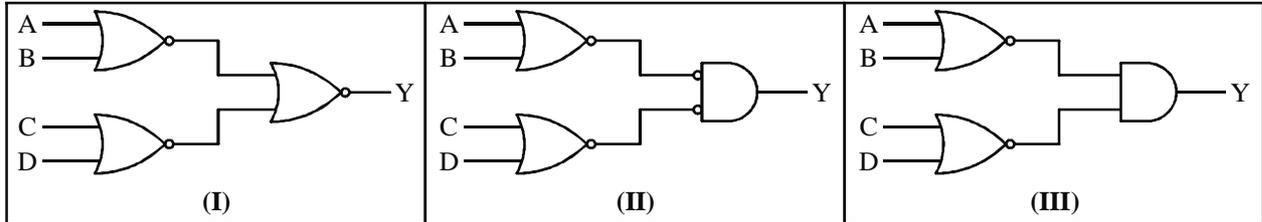
46. 4 men and 6 women can complete a work in 8 days, while 3 men and 7 women can complete it in 10 days. In how many days will 10 women complete it?
(a) 35 (b) 40 (c) 45 (d) 50
47. A man faces towards north. Turning to his right, he walks 25 meters. He then turns to his left and walks 30 metres. Net, he moves 25 metres to his right. He then turns to his right again and walks 55 metres. Finally, he turns to the right and moves 40 metres. In which direction is he from his starting point?
(a) South-West (b) South (c) North-west (d) South-East
48. What should come in place of (?)
5, 6, 14, 45, ?
(a) 160 (b) 120 (c) 184 (d) 150
49. In a meeting of 10 persons there are total of 4 chairs what is the total number of ways of arrangements?
(a) 6000 (b) 5040 (c) 720 (d) 8000
50. Looking at a portrait of a man, Sanjay said, "His mother is the wife of my father's son. Brothers and sisters I have none." At whose portrait was Sanjay Looking.
(a) His son (b) His nephew (c) His cousin (d) His uncle



PAPER-II

1. What function are carried out in an ALU ?
 (a) Arithmetic computations and logical decision.
 (b) Logical decisions only.
 (c) Arithmetic computations only
 (d) None of the above.

2. Given three circuit which is/are equivalent ?



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

3. We have given boolean equation :

$$Y = \bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + A\bar{B}\bar{C} + ABC\bar{C}$$

What is equivalent to Y is

- (a) \bar{B} (b) \bar{C} (c) A (d) None of these
4. How many of the following horn clause
 (i) $P \rightarrow Q$
 (ii) $(P \wedge Q) \rightarrow (R \vee \neg S)$
 (iii) $((A \cap B) \rightarrow (\neg R \vee S)) \rightarrow \neg T$
 (a) 1 (b) 2 (c) 3 (d) 0

5. In C++ which operators can't be overloaded ?

- (i) :: (ii) & (iii) ++ (iv) \rightarrow
 (a) (i) and (iv) (b) (i) and (ii) (c) (i) and (iii) (d) None of these

6. S1: In C++, by making at least one function virtual in a class becomes abstract class.
 S2: In interface only one function is virtual and all are normal.

Which of the following statement is/are TRUE ?

- (a) S1 and S2 (b) S1 (c) S2 (d) None of these

7. Match the following with link quality measurement and handoff initiation :

- | | |
|---|--|
| A. Networked- Controlled Handoff (NCHO) | 1. MS connect to BS |
| B. Mobile- Assisted Handoff (MAHO) | 2. Process via channel the target BS |
| C. Forward Handoff | 3. First Generation Analog Cellular System |
| D. Hard Handoff | 4. Second Generation Digital Cellular System |

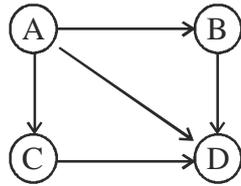
- | | | | |
|-------|---|---|---|
| A | B | C | D |
| (a) 3 | 4 | 2 | 1 |
| (b) 2 | 3 | 1 | 4 |
| (c) 2 | 1 | 4 | 3 |
| (d) 4 | 3 | 1 | 2 |

8. Suppose that a given application is run on a 64-processor machine and that 70 percent of the application can be parallelized. Then the expected performance improvement using Amdahl's law is
 (a) 4.22 (b) 3.22 (c) 3.32 (d) 3.52

9. The necessary conditions for deadlock
 (S1)Mutual Exclusion: There is a resource that cannot be shared.
 (S2)Hold and Wait: A process is holding at least one resource and waiting for another resource which is with some other process.
 (S3)No Preemption: The operating system is not allowed to take a resource back from a process until process gives it back.
 (S4)Circular Wait: A set of processes are waiting for each other in circular form.
 Which statements are is/true?
 (a) only S1 (b) only S1 and S2 (c) S1,S2 and S3 (d) All of these
10. In relation to thread(light weight process), which of the following is TRUE?
 (a) On per-thread basis, the OS maintains only CPU register state
 (b) The OS does not maintain a separate stack for each thread
 (c) On per-thread basis, the OS does not maintain virtual memory state
 (d) On per-thread basis, the OS maintains only scheduling and accounting information
11. Which one of the following options is CORRECT given three positive integers x, y and z, and a predicate?
 $P(x) = \neg(x=1) \wedge (\forall y (\exists z(x=y*z) \Rightarrow (y=x) \vee (y=1)))$
 (a) P(x) being true means that x is a prime number
 (b) P(x) being true means that x is a number other than 1
 (c) P(x) is always true irrespective of the value of x
 (d) P(x) being true means that x has exactly two factors other than 1 and x
12. Let $s(m, n)$ denote the number of onto functions from a set with m elements to a set with n elements, then $s(m, n)$ equal to ? [where $m \geq n$ and $n > 1$]
 (a) $n^m - \sum_{k=1}^n c(n, k) s(m, k)$ (b) $n^m - \sum_{k=1}^{n-1} c(n, k-1) s(m, k)$
 (c) $n^{m-1} - \sum_{k=1}^n c(n, k-1) s(m, k)$ (d) $n^m - \sum_{k=1}^{n-1} c(m, k) s(m, k)$
13. In floating point representation Biased exponent is ?
 (a) true exponent + Biased (b) true exponent - Biased
 (c) true exponent * Biased (d) none of these
14. Which of the following provide better precision and accuracy for storing a floating point number?
 (a) Implicit normalized number (b) Explicit normalized number
 (c) both (a) and (b) (d) none of these
15. Consider a system where cache access time is 20 ns and main memory access time is 150 ns, if the average access time is 40 ns, find the hit ratio of the cache?
 (a) .154 (b) .846 (c) .954 (d) none of these
16. If memory In a system is supported by cache, and cache is maintained using direct mapping, if the physical address in 32 bit long and each block contains 512 words and number of cache lines are 256, find the number of bits in the tag?
 (a) 11 (b) 13 (c) 15 (d) none of these
17. Consider a cache of 4 blocks, is used to satisfies the following main memory reference. Initially the cache is empty, compute the number of hits and cache status for LRU, if cache is directly mapped?
 $\boxed{7-4-13-4-7-12-19-4-26-12-12-110-19-12-7}$
 (a) None of these (b) 8, 12-7-110-26 (c) 7, 110,26,7,12 (d) 6, 110-19-12-7

18. A hypothetical system support only 2- address instructions, each instruction in 20 bit long and instructions are stored in a 128 words memory. How many 2 address instructions can be supported by the system?
 (a) 32 (b) 64 (c) 128 (d) 256
19. Which of the following is not a dependency in instruction pipelining?
 (a) Structural dependency (b) Data dependency
 (c) Control dependency (d) operator dependency
20. Consider a program which contains 100 instructions, which is to be executed on a 4 stage pipe lined processor, each have a stage delay of 10 ns, find the speed up?
 (a) 2.07 (b) 4 (c) 3.07 (d) none of these
21. Which of the following is not TRUE regards the kill command ?
 (a) For sure kill the signal number 9 is used.
 (b) There is no surety that the shell process will get killed by the command kill <PID> of the shell process.
 (c) Super user can kill daemon process.
 (d) None of the above.
22. Which of the following is not a method for performing i/o ?
 (a) Programmed I/O (b) Interrupt initiated I/O
 (c) Direct Memory Access (d) busy waiting input/output
23. The size of any block in the unix file system is
 (a) 512 bytes (b) 1024 bytes (c) 2048 bytes (d) Any of these
24. Match the following :
 (1) Through Put (i) Time between submission of process to first response is produced
 (2) Turn around time (ii) Amount of time of process has been in ready queue
 (3) Waiting time (iii) Number of Processes that completed per unit time
 (4) Response time (iv) Amount of time to execute a particular process
 (a) 1 – iii, 2 – iv, 3 – ii, 4 – i (b) 1 – iii, 2 – ii, 3 – i, 4 – iv
 (c) 1 – iv, 2 – iii, 3 – ii, 4 – i (d) 1 – iii, 2 – ii, 3 – iv, 4 – i
25. Assume we have a single processor system where jobs arrived at time 0 and the order of jobs for coming p, q, r, s, t. Calculate the completion time of Job t if scheduling is round robin with time slice 1.
- | Job-id | C.P.U. Burst Time |
|--------|-------------------|
| p | 4 |
| q | 1 |
| r | 8 |
| s | 1 |
| t | 3 |
- (a) 4 (b) 10 (c) 11 (d) 12
26. S_1 : A clique in a undirected graph $G = (V, E)$ is a subset $V' \subseteq V$ of vertices, each pair of which is connected by an edge in G .
 S_2 : A vector cover of an undirected graph $G = (V, E)$ is a subset $V' \subseteq V$ such that if $(u, v) \in E$ then $u \in V'$ or $v \in V'$ or (both) that is a vertex cover of G is a set of vertices that covers all edges in E . The size of vertex cover is the number of vertices in it.
 Which statement is/are true.
 (a) S_1 (b) S_2 (c) both (d) N.O.T.

27. We have a directed graph



which one of the following is true

- (a) The graph does not have topological ordering
- (b) Both ABCD and ACBD are topological ordering
- (c) Both ACDB and ABDC are topological ordering
- (d) ABCD is the only topological ordering

28. **List- I**

- A. Longest common subsequence
- B. Quick sort
- C. Minimum weight spanning tree
- D. Connected component

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

List- II

- 1. Greedy
- 2. Depth first search
- 3. Dynamic programming
- 4. Divide and conquer

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

29. By using Huffman coding to represent the characters what is the binary sequence for the character sequence: “fdheg” ?

given :

Characters	Frequencies
a	1
b	1
c	2
d	3
e	5
f	8
g	13
h	21

- (a) 110111100111010
- (b) 11011100111101
- (c) 111110111101
- (d) 110111100110010

30. If the quadratic probing is used and the table size is prime, then a new key value can always be inserted if the table is ?

- (a) at least half full
- (b) at most half full
- (c) equal to half full
- (d) N.O.T.

31. For distribution of keys most uniformly over 10 bucket subered 0 to 9. For values 0 to 1100. Which hosh function should be used?

- (a) $h(i) = i^2 \text{ mod } 10$
- (b) $h(i) = i^3 \text{ mod } 10$
- (c) $h(i) = (11 \times i^2) \text{ mod } 10$
- (d) $h(i) = (12 * i) \text{ mod } 10$

32. We want to use algo where number swaps minimum for sorting an arrayo which algo we use in general ?

- (a) Heap sort
- (b) Selection sort
- (c) Insertion sort
- (d) Merge sort

33. Let us consider a merge sort algorithm in the worst case takes 30 seconds for an input of size 64. which of the following most closely appronimates the maximum input size of a problem that can be solved in 6 minutes?

- (a) 256
- (b) 512
- (c) 1024
- (d) 2048

34. The preorder traversal sequence of b.s.t is 45, 35, 25,30, 40,38,54,50,57. Which of the following is the postorder traversal sequence of the same tree.

- (a) 25,35,30,38,40,50,57,54,45
- (b) 30,25,40,38,35,57,50,54,45
- (c) 30,35,25,38,40,57,50,54,45
- (d) 30,25,38,40,35,50,57,54,45



35. Let S be a sorted array of n integers. Let $t(n)$ denote the time taken for the most efficient algorithm to determine if there are two elements with sum equal to 1000 in S . which of the following statements is true?
 (a) $t(n)$ is $O(1)$ (b) $O(n) < t(n) < O(n)$
 (c) $T(n)$ is $O(n \log n)$ (d) $t(n) = n^2$
36. Given three Arrays
 Array 1 = [8, 9, 10, 11, 15, 11, 12, 18, 14, 16]
 Array 2 = [10, 12, 18, 20, 22, 25, 29, 21, 22]
 Array 3 = [8, 20, 25, 29, 21, 29, 30, 32, 35]
 Which is/are min-heap ?
 (a) Array 3 only (b) Array 1 and Array 2
 (c) Array 2 and Array 3 (d) All the arrays
37. If k is the number of internal nodes of a complete n -ary tree, the number of leaves in it will be
 (a) $k(n-1) + 1$ (b) $kn - 1$ (c) $kn + 1$ (d) $k(n+1)$
38. Doubly linked list two codes are given.
 P1:

```
List *ptr = (list*) malloc (size of (list));
ptr -> data = infor;
ptr -> next = Null;
ptr -> prev = tail
tail -> next = ptr
tail = ptr;
```

 P2:

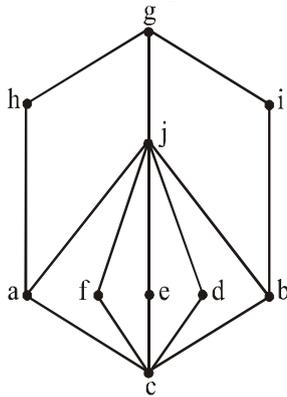
```
List * ptr = (list*) malloc (size of (list*))
ptr -> next = ptr;
ptr -> prev = p;
```

 Where,

```
struct list {
    int in for ;
    struct list * prev ;
    struct list * next;
}
```

 the codes are implementation of respectively. for the doubly link list ?
 (a) Insertion of beginning and insertion at last
 (b) Insertion at last and Insertion in middle
 (c) At beginning, and at last
 (d) N.O.T.
39. Given postfix expression $20\ 5 + 60\ 6 / *7 -$ what will be the result after evaluating it
 (a) 242 (b) 243 (c) 245 (d) N.O.T.
40. $T(1) = 1$
 $T(n) = 2T(n-1) + n, n \geq 2$ evaluates to
 (a) $2^{n+1} - n - 2$ (b) $2^n - n$ (c) $2^n - 2n - 2$ (d) $2^n - n + 1$
41. Match the following
- | List-I | List-II |
|----------------------------|-----------------------------|
| I. Dirty | (1) Page initialization |
| II. R/W | (2) Write-back-policy |
| III. Reference | (3) Page Protection |
| IV. Valid | (4) Page replacement policy |
| (a) I-4, II-1, III-2, IV-3 | (b) I-2, II-3, III-1, IV-4 |
| (c) I-2, II-3, III-4, IV-1 | (d) N.O.T. |
42. The number of positive integer less than or equal to 1000 that are relatively prime to 15 are
 (a) 427 (b) 473 (c) 527 (d) none of above

43. Consider the following lattice



How many number of complements for the element 'b'?

- (a) 0 (b) 3 (c) 5 (d) None of these
44. Consider the following implications
 $I_1 : ((P \rightarrow (Q \vee R)) \wedge \sim Q) \Rightarrow (P \rightarrow Q)$
 $I_2 : (P \rightarrow R) \wedge (Q \rightarrow R) \Rightarrow (P \vee Q) \rightarrow R$. Then
 Which of the following is True?
 (A) I_1 is True and I_2 is False (b) I_1 is false and I_2 is True
 (B) Both I_1 and I_2 are True (D) Both I_1 and I_2 are False
45. Let $S =$ set of all integers. A binary operation $*$ is defined by
 $a * b = a + b + 3$.
 Consider the following statements
 $\Rightarrow S_1 : (S, *)$ is a group
 $\Rightarrow S_2 : -3$ is identify element of $(S, *)$
 $\Rightarrow S_3 :$ the inverse of -6 is 0
 Which of the following is True?
 (a) Only S_1 and S_2 are true (b) Only S_2 and S_3 are true
 (c) Only S_1 and S_3 are true (d) S_1, S_2 and S_3 are true
46. G is a connected planar simple graph while 'e' edges and 'v' vertices. Let r be the number of regions in a planar representation as G , then
 (a) $r = e + v + 2$ (b) $r = e - v + 1$ (c) $r = e + v + 1$ (d) $r = e - v + 2$
47. The process in which of the following states will be in secondary memory?
 (a) New, Ready, Wait / Block
 (b) New, Wait / Block, Suspend wait, Suspend ready
 (c) Wait/Block, Suspend wait, Suspend ready
 (d) Suspend wait, Suspend ready
48. In an 8085 microprocessor, the contents of the accumulator, after the following instructions are executed will become
 XRAA
 MVI B F0 H
 SUB B
 (a) 01 H (b) 0 F H (c) F0 H (d) 10 H
49. Semaphore is used to enforce Mutual Exclusion and Synchronization between processes interacting over shared data and variables. Which of the following statement is true about semaphores in this regard?
 (a) The Operations SIGNAL(S) & WAIT (S) needs
 (b) A process exiting the CS will call SIGNAL(S)
 (c) 'Busy-Wait' solutions to the Critical Section are typically implemented using machine instructions that execute in the Kernal mode
 (d) All of the above

50. An Intel 8085 processor is executing the program given below.

```
MVI A, 10 H
MVI B, 10 H
BACK :    NOP
          ADD B
          RLC
          JNC BACK
          HLT
```

The number of times that the operation NOP will be executed is equal to

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

51. Consider the program segment :

```
x = 0; y = 0;
Cobegin
begin
    x = 1;
    y = y + x;
end
begin
    y = 2;
    x = x + 3;
end
```

end

Coend;

Which of the following indicates possible values for the variables when the segment finishes execution?

- (1) x = 1, y = 2
 (2) x = 1, y = 3
 (3) x = 4, y = 6
 (a) 1 only (b) 1 & 2 only (c) 1 & 3 only (d) 2 & 3 only

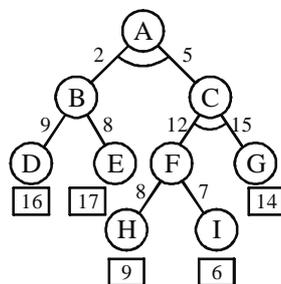
52. In javascript we want to convert "false" that is a non-string to string. The command that we use is (without invoking the "new" operator).

- (a) false.toString() (b) String(false)
 (c) String newvariable = "false" (d) Both (a) and (b)

53. Every action is intended to reduce its distance from target, which type of agent it is

- (a) simple reflex agent (b) goal based agent (c) model based agent (d) utility based agent

54. What is the cost of tree A-O algo ?



- (a) 57 (b) 58 (c) 59 (d) None of these

55. The web standard allows programmers on many different computer platforms to dispersed format and display the information server. These programs are called

- (a) Web browsers (b) HTML (c) Internet explorer (d) None of these



56. If A and B are two fuzzy sets with membership functions
 $\mu_A(X) = \{0.2, 0.5, 0.6, 0.1, 0.9\}$
 $\mu_B(X) = \{0.1, 0.5, 0.2, 0.7, 0.8\}$
 Then the value of $\mu_{A \cap B}$ will be
 (a) $\{0.2, 0.5, 0.6, 0.7, 0.9\}$ (b) $\{0.2, 0.5, 0.2, 0.1, 0.8\}$
 (c) $\{0.1, 0.5, 0.6, 0.1, 0.8\}$ (d) $\{0.1, 0.5, 0.2, 0.1, 0.8\}$
57. The height of $h(A)$ of a fuzzy set A is defined as
 $h(A) = \sup_{x \in A} A(x)$
 Then the fuzzy set A is called normal when
 (a) $h(A) = 0$ (b) $h(A) < 0$ (c) $h(A) = 1$ (d) $h(A) < 1$
58. An artificial neurons receives n inputs x_1, x_2, \dots, x_n with weights w_1, w_2, \dots, w_n attached to the input links. The weighted sum is computed to be passed on to a non-linear filter ϕ called activation function to release the output.
 (a) $\sum w_i$ (b) $\sum x_i$ (c) $\sum w_i + \sum x_i$ (d) $\sum w_i \cdot \sum x_i$
59. _____ is not an E-Commerce application.
 (a) House banking (b) Buying stocks
 (c) Conducting an auction (d) Evaluating an employee
60. $5 - 2 - 3 * 5 - 2$ evaluate to -14 if
 (a) $-$ is left associative and $*$ has precedence over $-$
 (b) $-$ is right associative and $*$ has precedence over $-$
 (c) $-$ is right associative and $-$ has precedence over $*$
 (d) $-$ is left associative and $-$ has precedence over $*$
61. What will be the output if static and dynamic scoping used.

```

int x = 5 ;
main () ;
{
g () ;
h () ;
}
f ()
{
printf ("%d", x) ;
}
g ()
{
int x = 12
f () ;
}
h ()
{
int x = 23
f () ;
}

```

 (a) 5 5 12 23 (b) 5 5 5 5 (c) 1 2 2 3 12 23 (d) None of these
62. A graph with 'n' vertices and $n - 1$ edges that is not a tree, is
 (a) Connected (b) Disconnected (c) Euler (d) A circuit
63. What will be the output of the following program :

```

int x = 5 ;
main ()
{
f () ;
g () ;
f () ;
g () ;
}

```

```

}
f()
{
    static int x = 2 ;
    printf(“%d”, x++);
}
g()
{
    printf(“%d”, x);
}

```

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

64. Spiral model of software development is
 (a) ends with delivery of software product
 (b) more complex than increment model
 (c) includes project risk evaluation in each iteration
 (d) all of the above
65. Which of the following is correct arrangement of coupling in order from low or high?
 (a) Control, Data, External, Common, Stamp, Content
 (b) Data, Control, External, Stamp, Content, Common
 (c) Data, Stamp, Control, External, Common, Content
 (d) Stamp, Data, Common, Control, Content, External
66. Find the size of software project

Estimate	Pessimistic	Most likely	Optimistic
Model 1	40	25	75
Model 2	30	40	85
Model 3	50	35	45
Model 4	55	55	35
Model 5	65	45	20

- (a) 21.66 (b) 218.6 (c) 216.67 (d) None of these
67. Compute function point value for a project with the following domain characteristics :
 Number of I/P = 40
 Number of O/P = 45
 Number of user inquires = 25
 Number of files = 6
 Number of external interface = 4
 Assume that all the complexity adjustment values are average ?
 (a) 613.11 (b) 613.11 (c) 713.11 (d) None of these
68. If the development effort for a software is estimated to be using cocomo model under embedded mode, such that size of the software is estimated to be 350 KLOC, consider $a_b = 3.6$, while $b_b = 1$?
 (a) 1243 (b) 1548 (c) 1260 (d) none of these
69. What is the availability of a software with the following reliability figures ?
 Mean time between failure (MTBF) = 5 days.
 Mean time to repair (MTTR) = 6 hours.
 (a) 94.23 (b) 96.23 (c) 95.23 (d) None of these
70. In the software design, which of the following is true about ER Diagram?
 (a) a separate table is required for each derived attribute
 (b) a separate table is required for each multivalued attribute
 (c) a separate column is required for each multivalued attribute
 (d) none of the above

71. Which of the following is wrong about testing?
 (a) testing must be based on user requirement
 (b) testing time, resource and cost are limited
 (c) Testing can be done without any planning
 (d) we must perform both functional and non-functional testing
72. Consider the following two languages : $L_1 = 0^* 1^*$, $L_2 = 1^* 0^*$
 What is the language $L_1 \cap L_2$?
 (a) $0^* 1^*$ (b) $1^* 0^*$ (c) $0^* + 1^*$ (d) $0^+ + 1^+$
73. Consider the following language $L = \{a^{5n} \mid n \geq 0\}$. What is the language L^5 ?
 (a) $\{a^{5n+5} \mid n \geq 0\}$ (b) $\{a^{25n} \mid n \geq 0\}$ (c) $\{a^{5n} \mid n \geq 0\}$ (d) None of these
74. Consider the following languages : $L_1 = \{b^{2n} \mid n \geq 0\}$, $L_2 = \{a^n \mid n \geq 0\}$. What is the language $L_2 L_1$?
 (a) $\{a^n b^{2n} \mid n \geq 0\}$ (b) $\{a^n b^{2m} \mid n \geq 0; m \geq 0\}$
 (c) $\{a^n b^{2n} \mid n \geq 1\}$ (d) None of these
75. If $L = \{w \in \{0, 1\}^* \mid N_0(w) > N_1(w)\}$. The grammar generating L is ?
 (a) $S \rightarrow 0 \mid 0S \mid 0S1 \mid 1S0$ (b) $S \rightarrow 0 \mid 0S0 \mid 1S1 \mid 11S \mid S11$
 (c) $S \rightarrow 0 \mid 0S \mid 1S1 \mid 11S \mid S11$ (d) $S \rightarrow 0 \mid 0S0 \mid 0S1 \mid 1S0$
76. If an artificial variable is present in the 'basic variable' of optimal simplex table the solution is
 (a) alternative (b) infeasible (c) unbounded (d) none of these
77. Solve the following LPP by graphical method :
 Max $Z = 3x + 4y$
 Subject to $2x + 2y \leq 80$
 $3x + 4y = 120$
 $x, y \geq 0$
 (a) (20, 30) (b) (20, 20) (c) (60, 0) (d) None of these
78. Obtain the initial solution to using least cost method :
- | | A | B | C | D | Supply |
|--------|---|----|----|---|--------|
| I | 6 | 3 | 5 | 4 | 22 |
| II | 5 | 5 | 2 | 7 | 15 |
| III | 5 | 7 | 8 | 6 | 8 |
| Demand | 7 | 12 | 17 | 9 | |
- (a) 150 (b) 100 (c) 200 (d) None of these
79. Find the coordinate of the line segment when a line $y = x + 2$ is clipped against a circular window of radius $\sqrt{20}$ and centre at (0, 0)
 (a) (2, 4) (-4, -2) (b) (-2, -4) (4, 2) (c) (4, 2) (-2, -4) (d) None of these
80. Choose the **correct** statement(s) :
 (a) Random-scan monitors draw a picture one line at a time.
 (b) Raster-scan monitors draw a picture one line at a time.
 (c) Random-scan method is well suited for displaying shading and colour areas.
 (d) None of the above.

81. Suppose an RGB raster system is to be designed using an 8 inch \times 10 inch screen with a resolution of 100 pixels per inch in each direction. If we want to store 6 bits per pixel in the frame buffer, how much storage in bytes do we need for the frame buffer ? Also find out the aspect ratio of the raster system ?
 (a) 6×10^5 byte, 4 : 5 (b) 5 : 4, 6×10^6 byte (c) 6×10^8 byte, 4 : 5 (d) None of these
82. Which of the following set of probability of symbol combination produces maximum entropy?
 (a) $p(x_1) = 1/4, p(x_2) = 1/4, p(x_3) = 1/4, p(x_4) = 1/4$
 (b) $p(x_1) = 3/8, p(x_2) = 1/8, p(x_3) = 1/4, p(x_4) = 1/4$
 (c) $p(x_1) = 1/2, p(x_2) = 1/4, p(x_3) = 1/8, p(x_4) = 1/8$
 (d) $p(x_1) = 1/4, p(x_2) = 1/4, p(x_3) = 5/12, p(x_4) = 1/12$
83. The number of 8 digit binary strings begins with 111 or ends with 101 is
 (a) 70 (b) 60 (c) 50 (d) none of these
84. Match the following
- | | |
|--------------------------------|--------------------------|
| (i) Unrestricted grammar | (A) Pushdown automaton |
| (ii) Context sensitive grammar | (B) D.F.A. |
| (iii) Context free grammar | (C) Recursive enumerable |
| (iv) Regular grammar | (D) Recursive language |
- | | | | | |
|-----|---------------|----|----|----|
| | A | B | C | D |
| (a) | iii | iv | i | ii |
| (b) | iii | iv | ii | i |
| (c) | iii | ii | i | iv |
| (d) | none of these | | | |

85. Consider the following table

A	B	C
1	2	3
4	2	3
5	5	3

Which one of the following dependencies does not hold in R?

- (a) $A \rightarrow B$ (b) $BC \rightarrow A$ (c) $B \rightarrow C$ (d) $A \rightarrow C$
86. Let R (A, B, C, D, E, F, G) be a relational schema in which the following functional dependencies are known to hold; $AB \rightarrow CD, DE \rightarrow F, C \rightarrow E, C \rightarrow E, F \rightarrow C$ and $B \rightarrow G$. The relational schema R is
 (a) In BCNF (b) 3NF, but not in BCNF
 (c) In 2NF, but not in 3NF (d) not in 2NF
87. Which of the following schedules is not conflict serializable?
 (i) $r_1(x), r_3(x), w_1(x), r_2(x), w_2(x)$
 (ii) $r_3(x), r_2(x), w_3(x), r_1(x), w_1(x)$
 (iii) $r_1(x), r_3(x), w_3(x), w_1(x), r_2(x)$
 (a) (i) & (ii) (b) only (iii) (c) only (ii) (d) none of these
88. Match the following :

List I

- A. 2NF
 B. 3NF
 C. 4NF
 D. 5NF

List II

1. Transitive dependencies eliminated
 2. Multivalued attribute removed
 3. Contains no partial functional dependencies
 4. Contains no join dependency



Codes :

	A	B	C	D
(a)	1	3	2	4
(b)	3	1	2	4
(c)	4	3	2	1
(d)	none of these			

89. Given relations, borrower (customer_name, loan_number), depositor (customer_name, account_number). Find the names of all bank customers who have either an account or loan or both
- (i) Π customer_name (borrower) \cap Π customer_name (depositor)
(ii) Π customer_name (borrower) \cup Π customer_name (depositor)
- (a) i & ii (b) i (c) ii (d) none of these
90. Which of one following statement on the view concept in SQL is invalid
- (a) All views are not updateable
(b) The views may be referenced in an SQL statement whenever table are referenced
(c) The views are instantiated at the time they are referenced and not when they are defines
(d) The definition of a view should not have GROUP by clause in it.
91. The order of an internal node in a B⁺ tree index is the maximum number of children it can have suppose that a child pointer takes 6 bytes, the search field value takes 14 bytes and the block size is 512 bytes. What is the order of the internal node?
- (a) 24 (b) 25 (c) 27 (d) 26
92. Find the number of tokens in the following C program:
- ```
int main () {
char 2ac/d
int b ;
b = b + 1 ;
printf ("% d", b);
}
```
- (a) 31                      (b) 29                      (c) 27                      (d) 28
93. Which of the following statements is true?
- (a) SLR passer is more powerful than LALR  
(b) LALR parser is more powerful than canonical LR parser  
(c) Canonical LR parser is more powerful than LALR parser  
(d) None of these
94. In a digital communication system transmission of successive bits through a noisy channel are assumed to be independent events with error probability P. The probability of at most one error in the transmission of an 8 bit sequence is
- (a)  $(1 - p)^8 + (1 - p)^7$                       (b)  $(1 - p)^8 + p(1 - p)^7$   
(c)  $(1 - p)^8 + 8p(1 - p)^7$                       (d) none of these
95. What is the typical range of Ephemeral ports
- (a) 1 to 65535                      (b) 1024 to 65535                      (c) 1 to 1024                      (d) 0 to 1023
96. The information at the transport layer is called
- (a) Packet                      (b) Segment                      (c) Frame                      (d) Message
97. The default connection type used by HTTP 1.1 later verions is -
- (a) persistent                      (b) Non persistent                      (c) Both                      (d) None of the above

98. If subnet mask 255.255.255.240, which of the following will be possible broadcast address?  
(a) 210.90.88.47      (b) 210.90.88.77      (c) 210.90.88.14      (d) None of the above
99. Consider different activities related to E-mail  
A1: Checking email in a web browser  
A2: Send an email from a mail client to mail server  
A3: Download an email from mailbox server to mail client which is the applicable level in each activity  
(a) A1 : HTTP, A2 : SMTP, A3 : POP3      (b) A1: SMTP, A2: FTP, A3; HTTP  
(c) A1: SMTP, A2: POP3, A3: HTTP      (d) A1: POP3, A2: SMTP, A3: IMAP
100. To transmit a message 10101 using Hamming code technique. The actual information transmit from the sender will be  
(a) 111101100      (b) 110101100      (c) 101010101      (d) None of these above



Space for rough work





UGC-NET COMPUTER SCIENCE & APPLICATIONS

Date: 02-12-2018

Test Series-D

## ANSWER KEY

### PAPER – I

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

### PAPER – II

- |         |         |         |         |          |
|---------|---------|---------|---------|----------|
| 1. (a)  | 2. (b)  | 3. (b)  | 4. (b)  | 5. (a)   |
| 6. (d)  | 7. (a)  | 8. (b)  | 9. (d)  | 10. (c)  |
| 11. (a) | 12. (d) | 13. (a) | 14. (a) | 15. (b)  |
| 16. (c) | 17. (d) | 18. (c) | 19. (d) | 20. (c)  |
| 21. (c) | 22. (d) | 23. (d) | 24. (a) | 25. (c)  |
| 26. (c) | 27. (b) | 28. (b) | 29. (a) | 30. (a)  |
| 31. (b) | 32. (b) | 33. (b) | 34. (b) | 35. (c)  |
| 36. (c) | 37. (a) | 38. (b) | 39. (b) | 40. (a)  |
| 41. (c) | 42. (c) | 43. (d) | 44. (c) | 45. (d)  |
| 46. (d) | 47. (d) | 48. (d) | 49. (d) | 50. (c)  |
| 51. (d) | 52. (d) | 53. (b) | 54. (d) | 55. (a)  |
| 56. (d) | 57. (c) | 58. (d) | 59. (d) | 60. (a)  |
| 61. (a) | 62. (b) | 63. (a) | 64. (c) | 65. (c)  |
| 66. (c) | 67. (b) | 68. (c) | 69. (d) | 70. (b)  |
| 71. (c) | 72. (c) | 73. (c) | 74. (b) | 75. (c)  |
| 76. (b) | 77. (b) | 78. (a) | 79. (a) | 80. (a)  |
| 81. (a) | 82. (a) | 83. (b) | 84. (a) | 85. (b)  |
| 86. (d) | 87. (b) | 88. (b) | 89. (c) | 90. (d)  |
| 91. (d) | 92. (d) | 93. (c) | 94. (b) | 95. (b)  |
| 96. (b) | 97. (a) | 98. (a) | 99. (a) | 100. (b) |

