

TEST SERIES UGC-NET/JRF DEC. 2018

BOOKLET SERIES **A**

Paper Code **87**

Test Type: **TEST SERIES**

COMPUTER SCIENCE & APPLICATIONS

Duration: 01:30 Hours

Date: 18-11-2018

Maximum Marks: 140

Read the following instructions carefully:

1. Single Paper Test is divided into **TWO** Parts.
2. **Part - I:** This part shall carry **20** questions. Each question shall be of **2 marks**.
3. **Part - II:** This part shall contain **50** 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. Raman expects 20% profit by selling a fan. If he allows 40% discount on MRP, then his cost price is what percent of marked price ?
 (a) 40 % (b) 60 % (c) 50 % (d) 100 %
2. Fill the blank space : S . S . M . T . ___ . ___ . ___
 (a) T T F (b) T F T (c) T W F (d) W T F
3. Find the wrong : 1 2 5 10 15 20 50 100 200 500 2000
 (a) 15 (b) 100 (c) 200 (d) 2000
4. Rakesh can complete a piece of work in 40 days. He can complete same work with the help of Ranjan in 30 days. If they are paid Rs. 1200 for the work, then what is share of Ranjan ?
 (a) 900 (b) 300 (c) 600 (d) 400
5. Statement : 1. All teachers are doctors.
 2. All doctors are engineers.
 3. All engineers are students.
 Conclusion : I. Some students are teacher.
 II. All doctors are students.
 III. Some engineers are teachers.
 IV. All doctors are teachers.
 (a) Only I and II (b) Only I and III (c) Only I, II and III (d) All of these
6. Day after tomorrow will be Lord Ganesha festival. In the next week the same day will be Deepawali. If today is Friday, then which day will be 4 days after Deepawali ?
 (a) Saturday (b) Sunday (c) Friday (d) Thursday
7. Q travelled towards East M travelled towards North S and T travelled in opposite direction, T travelled right to Q. Which statements is definitely true in following sentence.
 (a) M and S are travelling in opposite direction.
 (b) T travelled towards West.
 (c) T travelled towards North.
 (d) M and S travelled in same direction.
8. If REACHING TOMORROW is coded as HOJIDBFS XPSSPNPU, then UIHJMG EFZBMFE means
 (a) TRAINS DELAYED (b) FLIGHT DELAYED
 (c) CANCEL JOURNEY (d) FLIGHT CANCEL
9. 3 10 101
 (a) 10101 (b) 10201 (c) 10202 (d) 11012
10.

13	54	?
7	45	32
27	144	68

 (a) 42 (b) 36 (c) 6 (d) 4

Direction: The passage is followed by 4 questions (11 to 14) based on its content. After reading passage, choose the best answer to each question. Answer all questions following the passage on the basis of what is stated or implied in the passage.

Many critics of Emily Bronte's novel *Wuthering Heights* see its second part as a counterpoint that comments on, if does not reverse, the first part, where a "romantic" reading receives more confirmation. Seeing the two parts as a whole is encouraged by the novel's sophisticated structure, revealed in its complex use of narrators and time shifts. Granted that the presence of these elements need not argue an authorial awareness of novelistic construction comparable to that of Henry James, their presence does encourage attempts to unify the novel's heterogeneous parts. However, any interpretation that seeks to unify of the novel's diverse elements is bound to be somewhat unconvincing. This is not because such an interpretation necessarily stiffens into a thesis (although rigidity in any interpretation of this or of any novel is always a danger), but because *Wuthering Heights* has recalcitrant elements of undesirable power that ultimately, resist inclusion in an all-encompassing interpretation. In this respect, *Wuthering Heights* shares a feature of *Hamlet*.

11. According to the passage, which of the following is a true statement about the first and second parts of *Wuthering Heights*?
- The second part has received more attention from critics.
 - The second part has little relation to the first part.
 - The second part is better because it is more realistic.
 - The second part provides less substantiation for a "romantic" reading.
12. Which of the following inferences about Henry James's awareness of novelistic construction is best supported by the passage?
- James, more than any other novelist, was aware of the difficulties of novelistic construction.
 - James was very aware of the details of novelistic construction.
 - James's awareness of novelistic construction derived from the reading of Bronte.
 - James's awareness of novelistic construction has led most commentators to see unity in his individual novels.
13. The author of the passage would be most likely to agree that an interpretation of a novel should:
- not try to unite heterogeneous elements in the novel.
 - not be inflexible in its treatment of the elements in the novel.
 - not argue that the complex use of narrators or of time shifts indicates a sophisticated structure.
 - concentrate on those recalcitrant elements of the novel that are outside the novel's main structure.
14. The author of the passage suggests which of the following about *Hamlet*?
- Hamlet* has usually attracted critical interpretations that tend to stiffen into thesis.
 - Hamlet* has elements that are not amenable to an all-encompassing critical interpretation.
 - Hamlet* is less open to an all-encompassing critical interpretation that is *Wuthering Heights*.
 - Hamlet* has not received a critical interpretation that has been widely accepted by readers.
- I only
 - II only
 - I and IV only
 - I, II and III only
15. By taking a level of significance of 10% it is the same as saying
- We are 10% confident the results have not occurred by chance
 - We are 90% confident that the results have not occurred by chance
 - We are 90% confident that the results have occurred by chance
 - None of the above
16. In India water is classified in how many categories on the basis of quality?
- 4
 - 3
 - 6
 - 5
17. When the offices of both Speaker and Deputy Speaker falls vacant
- The members of Lok Sabha immediately elect a Speaker.
 - The senior most willing member of Lok Sabha becomes the speaker.
 - The President appoints any member of Lok Sabha as speaker.
 - The Deputy Chairman of Rajya Sabha presides over till the next speaker is elected.

18. It is said that communication is collective, this mean:
 (a) It is made up of experiences collected over a lifetime.
 (b) It is based on social agreement.
 (c) It is an ongoing process without beginning or end.
 (d) It allows us to control those around us.
19. The main duty of a teacher is
 (a) To stimulate and guide student's learning.
 (b) To provide remedial aid and diagnostic aid wherever required.
 (c) To teach only the prescribed curriculum.
 (d) To ensure that all students belong to same social group.
20. Verbal guidance is most effective in
 (a) concepts (b) attitudes (c) relationships (d) All of these

PAPER – II

21. In a LPP suppose there are 4 basic variable and 2 non basic variable, then the possible number of basic solution are
 (a) 16 (b) 15 (c) 17 (d) None of these
22. The following LPP has
 Max $Z = x_1 + x_2$
 Subject to $x_1 - x_2 \geq 0$
 $3x_1 - x_2 \leq -3$
 $x_1, x_2 \geq 0$
 (a) No feasible solution (b) Feasible solution
 (c) Unbounded solution (d) None of these
23. Obtain the initial solution using the North-West corner method :
- | | D ₁ | D ₂ | D ₃ | D ₄ | Supply |
|----------------|----------------|----------------|----------------|----------------|--------|
| Q ₁ | 6 | 4 | 1 | 5 | 14 |
| Q ₂ | 8 | 9 | 2 | 7 | 16 |
| Q ₃ | 4 | 3 | 6 | 2 | 5 |
| Demand | 6 | 10 | 15 | 4 | |
- (a) 128 (b) 138 (c) 118 (d) None of these
24. Which of the following special cases does not require reformation of the problem in order to obtain a solution?
 (a) alternative optimality (b) infeasibility
 (c) unbounded (d) none of these
25. At every iteration of simplex method for minimization problem, a variable in the current basis is replaced with another variable that has
 (a) a positive $c_j - z_j$ value (b) $c_j - z_j = 0$
 (c) a negative $c_j - z_j$ value (d) none of these
26. What is the normal order of activities in which software testing is organized ?
 (a) Unit, intergration, System, validation (b) System, integration, unit, validation
 (c) Unit, integration, validation, system (d) none of these

27. Alpha and Beta testing are forms of
 (a) Acceptance testing (b) Integration testing
 (c) System testing (d) none of these
28. Which of one following is not coupling :
 (i) Data coupling (ii) Stamp coupling
 (iii) Temporal coupling (iv) Content coupling
 (a) (i) & (iii) (b) Only (iv) (c) Only (iii) (d) all of these
29. What is the availability of a software with one following reliability figures?
 Meantime a between failure (MTBF) = 26 day
 Meantime to repair (MTTR) = 5 hours
 (a) 99.205% (b) 0.99205% (c) 0.099% (d) None of these
30. Assume a program will experience a total 200 failures. Initial failure intensity is 16 failure/CPU hr. It has now experienced 50 failures. Determine the following after specifying the formula decrement of failure intensity
 (a) 0.008 hr (b) -0.08 hr (c) .8 hr (d) none of these
31. Consider the program given below.

```
void main ( )
{
  int i, j, k;
  readln (i, j, k);
  if ((i < j) || (i > k))
  {
    writeln ("than part 1")
    if (j < k)
      writeln (" j less than k")
    else writeln ("j not less than k")
  }
  else writeln ("else part");
}
```

 What is the cyclometric complexity of above program.
 (a) 2 (b) 3 (c) 4 (d) none of these
32. A company needs to develop a software for a webapplication. The software is expected to have a 4000 optimistic LOC, 6000 mostlikely LOC & 8000 pessimistic LOC, what is the expected size
 (a) 6000 LOC (b) 60000 LOC (c) 60 LOC (d) 6000 LOC
33. What is the maximum value of CAF
 (a) 1.35 (b) 1.45 (c) 1.25 (d) None of these
34. If we have three component having reliability 0.9 each what is reliability is parallel system
 (a) 0.98 (b) 0.999 (c) 999 (d) none of these
35. Estimation of software development effort for organic software in COCOMO is
 (a) $E = 2.4 (KLOC)^{1.5} PM$ (b) $E = 3.4 (KLOC)^{1.06} PM$
 (c) $E = 2.0 (KLOC)^{1.05} PM$ (d) $E = 2.4 (KLOC)^{1.07} PM$
36. Multiplexing technique that shifts each signal to different carrier frequency ?
 (a) FDM (b) TDM (c) Both (d) None of these
37. In a fully connected mesh network with 20 computers, total _____ number of cables are required and _____ number of ports are required for each device.
 (a) 190, 19 (b) 45, 9 (c) 20, 19 (d) None of these

38. Match the following :

List-I	List-II
A. Application layer	1. PPP
B. Transport layer	2. RARP
C. Network layer	3. FTP
D. Datalink layer	4. UDP

Codes :

	A	B	C	D
(a)	2	3	1	4
(b)	3	4	2	1
(c)	3	4	1	2
(d)	None of the above			

39. If IP : 204.54.89.119 and subnetmask : 255.255.255.240, then calculate subnet ID and last host of that subnet
 (a) 204.54.89.119, 204.54.89.126 (b) 204.54.89.112, 204.54.89.126
 (c) 204.54.89.112, 204.54.89.127 (d) None of these

40. Assume that in stop and wait ARQ the band width of the line is 1 mbps and 1 bit takes 20 ms to make a round trip the bandwidth delay product, if the system data frame 1000 bits in length the what is utilization % of the link.
 (a) 4 % (b) 0.5 % (c) 50 % (d) 5 %

41. Which of the following statements is
 (i) Packet switching loads to better utilization of band width resource than circuit switching.
 (ii) Packet switching result in less variation in delay than circuit switching.
 (iii) Packet switching requires more per-packet processing than circuit switching.
 (a) (i) and (ii) (b) (ii) and (iii) (c) (i), (ii) and (iii) (d) (i) and (iii)

42. Which multiple access techniques used by IEEE 802.11 standard for wireless LAN ?
 (a) CDMA (b) CSMA/CA (c) ALOHA (d) None of these

43. If the original size of data is 20 then after adding error detection redundancy bit the size of data length is
 (a) 24 (b) 25 (c) 26 (d) 27

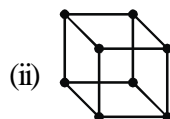
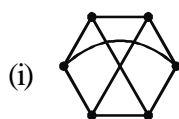
44. Using $p = 4$, $q = 12$, $d = 7$ and $e = 4$ in the RSA algorithm, what is the value of cipher text for a plain text 5?
 (a) 8 (b) 2 (c) 3 (d) 1

45. Checksum of 10101001 00111001 is
 (a) 00001101 (b) 11100001 (c) 00011101 (d) None of these

46. A graph with 'n' vertices and $n - 1$ edges that is not a tree, is
 (a) Connected (b) Disconnected (c) Euler (d) A circuit

47. If a graph requires k different colours for its proper colouring, then the chromatic number of the graph is
 (a) 1 (b) k (c) $k - 1$ (d) $k/2$

48. Which of the following is not planar ?



(a) (i) only (b) (ii) only (c) Both (d) None of these

49. Match the following :

List-I

(i) $a + b = 0$

(ii) $a + b = c$

(iii) a divides b (a and b are integer)

(a) (i)-1, (ii)-2, (iii)-3 (b) (i)-2, (ii)-1, (iii)-3 (c) (i)-3, (ii)-2, (iii)-1 (d) None of these

List-II

1. $\forall a \forall b \exists c Z(a, b, c)$

2. $\forall a \exists b Q(a, b)$

3. $\exists a \forall b P(m, n)$

50. "If a and b, then c unless d and e" is represented by in propositional logic ?

(a) $((a \wedge b) \wedge c) \rightarrow \neg(d \wedge e)$

(b) $((a \wedge b) \wedge \neg(d \wedge e)) \rightarrow c$

(c) $(a \wedge b) \rightarrow (c \wedge \neg(d \wedge e))$

(d) $c \rightarrow ((a \wedge b) \wedge \neg(d \wedge e))$

51. Let G be a non planar graph with the minimum possible number of vertices, then G has

(a) 9 edges and 5 vertices

(b) 9 edges and 6 vertices

(c) 10 edges and 5 vertices

(d) 10 edges and 6 vertices

52. A relation R in $\{1, 2, 3, 4, 5, 6\}$ is given by $\{(1, 2); (2, 3); (3, 4); (4, 4); (4, 5)\}$ this relation is

(a) reflexive

(b) symmetric

(c) transitive

(d) not reflexive, not symmetric and not transitive

53. Given two statements

(I) if a function $y' = f(x)$ has an inverse function, then $f(x)$ can't be symmetric about y-axis

(II) If A has 32 elements, B has 42 elements and $A \cup B$ has 62 elements, then the number of elements in $A \cap B$ is 12.

Which one is/are TRUE?

(a) I and II

(b) I only

(c) II only

(d) None of these

54. Let P(E) denotes the probability of the event E. Given, $P(A) = 1$, $P(B) = 1/2$, then the values of $P(A/B)$ and $P(B/A)$ respectively are

(a) $\frac{1}{4}, \frac{1}{2}$

(b) $\frac{1}{2}, \frac{1}{4}$

(c) $\frac{1}{2}, 1$

(d) $1, \frac{1}{2}$

55. Convert the sentence into first order predicate logic

"Employee or Manager got Promoted, if they work hard or smart".

(a) $\forall x [(\text{manager}(x) \wedge \text{Employee}(x)) \rightarrow \{\text{workHard}(x) \vee \text{work Smart}(x) \rightarrow \text{promoted}(x)\}]$

(b) $\forall x [(\text{manager}(x) \vee \text{Employee}(x)) \rightarrow \{\text{workHard}(x) \wedge \text{work Smart}(x) \rightarrow \text{promoted}(x)\}]$

(c) $\forall x [(\text{manager}(x) \vee \text{Employee}(x)) \rightarrow \{\text{workHard}(x) \vee \text{work Smart}(x) \rightarrow \text{promoted}(x)\}]$

(d) None of these

56. A hash function h defined $h(\text{key}) = \text{key} \bmod 7$, with linear probing, is used to insert the keys 44, 45, 79, 55, 91, 18, 65 into a table indexed from 0 to 6. What will be the location of key 65 ?

(a) 0

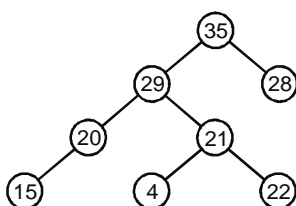
(b) 1

(c) 3

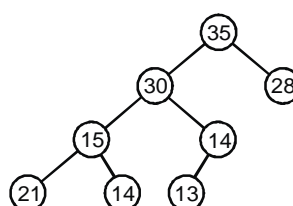
(d) 2

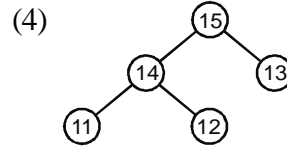
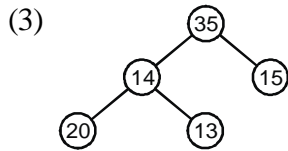
57. Which of the following is a valid heap ?

(1)



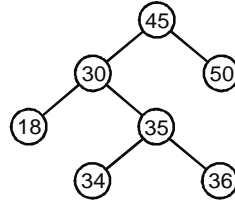
(2)





- (a) All are correct (b) (4) only (c) (1) and (4) (d) (2) and (4)

58. Consider the following binary search tree.



If we remove the root node, which of the node from the left will be the new root ?

- (a) 18 (b) 35 (c) 34 (d) 36

59. How many elements can be held by an array A

$A(-2, 5; 1, m; -2, m-2)$

- (a) $8m(m-1)$ (b) $8m(m+1)$ (c) $8(m+1)(m+2)$ (d) $8m(m+2)$

60. Which one of the following algorithm design techniques is used in finding all pairs of shortest distances in a graph?

- (a) Dynamic programming (b) Backtracking
(c) Greedy (d) Divide and Conquer

61. The brute-force algorithm for solving the travelling salesman problem is

- (a) an approximate and efficient algorithm. (b) an optimal and efficient algorithm.
(c) an approximate and inefficient algorithm. (d) an optimal and inefficient algorithm.

62. Given : $T(1) = 1$

$T(n) = 2T(n-1) + 1, n \geq 2$

Evaluates to when $n = 9$

- (a) 510 (b) 509 (c) 511 (d) None of these

63. An array of 200 size is given. The maximum and the minimum of these 200 number needs to be determined, minimum number of comparison needed ?

- (a) 298 (b) 297 (c) 296 (d) 299

64. Find out the time complexity of the following code :

For ($i = 0; i < n; i++$)

For ($j = 0; j < 100; j++$)

For ($k = 0; k < n; k++$)

For ($l = 0; l < 1000; l++$)

printf("Hello");

- (a) $O(n^3)$ (b) $O(n^2)$ (c) $O(n^4)$ (d) None of these

65. The running time of the following algorithm is $A(n)$. If $n \leq 2$ return n else return $\sqrt{n} A(\sqrt{n})$; is best described by

- (a) $O(n^2 \log \log n)$ (b) $O(\log \log n)$ (c) $O(n \log \log n)$ (d) $O(n^2)$

66. What will be the result after evaluating the postfix expression : $9\ 2\ 1\ +\ -\ 3\ 9\ 3\ / \ + \ * \ 8 \ *$

- (a) 276 (b) 288 (c) 289 (d) None of these



67. `int *A;`
`func(int sb, int val) {`
`static int size = 0, sTop = 0;`
`switch (sTop - sb){`
`case-1 : size = val; break;`
`case-0 : if (sTop < size)`
`A[sTop++]=val; break;`
`default : if (sTop < sb)`
`return A[--sTop];`
`}`
`return -1; }`
`main() {`
`int s[20]; A = s;`
`func(-1, 10);`
`func(0, 10);`
`printf(“%d\n”, func(2, 0)); }`
- (a) -1 (b) 9 (c) Undefined (d) 10

68. Apply quick sort on the array :

25	10	30	15	20	28	32
----	----	----	----	----	----	----

Choose the pivot as index 0, after first pass the array look like.

- (a)

20	10	15	25	30	28	32
----	----	----	----	----	----	----

 (b)

20	15	10	25	30	32	28
----	----	----	----	----	----	----
- (c)

15	20	10	25	32	28	30
----	----	----	----	----	----	----

 (d)

20	10	15	25	28	30	32
----	----	----	----	----	----	----

69. Minimum number of nodes in an AVL tree of height 6 is ?
 (a) 33 (b) 32 (c) 31 (d) 30

70. A linked list contains the value 14, 12, 10, 8, 6, 4, 2 in the given order. What will be the contents of the list after the function completes execution ?

```
struct node
{
  int value ;
  struct node * next;
}
void func(struct node * list)
{
  struct node *p, *q;
  int temp;
  if (!list || !list -> next) return;
  p = list; q = list -> next;
  while (q) {
    temp = p -> value;
    p -> value = q -> value;
    q -> value = temp;
    p = q -> next;
    q = p? p -> next : 0;
  }
}
```

- (a) 2, 4, 6, 8, 10, 12, 14 (b) 12, 14, 8, 10, 4, 6, 2
 (c) 12, 14, 8, 10, 6, 4, 2 (d) 12, 14, 8, 10, 2, 6, 4

Space for rough work





UGC-NET COMPUTER SCIENCE & APPLICATIONS

Test Series- A

Date: 18-11-2018

ANSWER KEY

PAPER – I

1. (c)	2. (d)	3. (a)	4. (b)	5. (c)	6. (d)	7. (d)
8. (b)	9. (c)	10. (d)	11. (d)	12. (b)	13. (b)	14. (b)
15. (b)	16. (d)	17. (c)	18. (b)	19. (a)	20. (d)	

PAPER – II

21. (b)	22. (a)	23. (a)	24. (a)	25. (c)	26. (a)	27. (a)
28. (c)	29. (a)	30. (b)	31. (c)	32. (d)	33. (a)	34. (b)
35. (a)	36. (a)	37. (a)	38. (b)	39. (b)	40. (b)	41. (d)
42. (b)	43. (b)	44. (d)	45. (c)	46. (b)	47. (b)	48. (a)
49. (b)	50. (b)	51. (c)	52. (d)	53. (a)	54. (d)	55. (c)
56. (b)	57. (b)	58. (d)	59. (b)	60. (a)	61. (d)	62. (c)
63. (a)	64. (b)	65. (c)	66. (b)	67. (d)	68. (a)	69. (a)
70. (b)						

