

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

BOOKLET SERIES **C**

Paper Code **87**

Test Type: **TEST SERIES**

Full Length Test Series-3

COMPUTER SCIENCE & APPLICATIONS

Duration: 03:00 Hours

Date: 28-11-2019

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

- The direct and immediate cognition produced by the interaction between object and sense organs is defined by
(a) Upamana (b) Shabda (c) Pratyaksha (d) Anumana
- Which of the following pair is represent the condition of 'contradictory' proposition:
(a) $A \leftrightarrow O$ (b) $I \leftrightarrow E$ (c) $A \leftrightarrow E$ (d) $E \leftrightarrow O$
 $A \leftrightarrow I$ $O \leftrightarrow A$ $I \leftrightarrow O$ $I \leftrightarrow O$
- 'A' is true because B is true. 'B is true because A is true', this type of argument is termed as
(a) Inductive argument (b) Deductive argument
(c) Circular argument (d) None of the above
- Statements — Conclusions —
1. Some books are pens. I. Some pencils are books.
2. Some pencils are pens. II. No books are pencils.
(a) Only I follows (b) Only II follows
(c) Either I or II follows (d) Both I and II follows
- Find the correct diagram of given words:
• Words with one vowels.
• Words with only constant.
• Words with three vowels.
(a)  (b)  (c)  (d) 
- ___OP___MO___N___PNMOP___
Choose the missing terms out of given alternation:
(a) MNPOMN (b) MPNMOP (c) MNOMPN (d) MNPMON
- Two places are 100 km apart to each other. A man started walk from first place towards second one with the speed of 30 km/hr at 8 a.m. After 1 hour another men started walk from second place, to first place with he speed of 40 km/hr. At what time will they meet and how far is the place of meeting from the first place ?
(a) 10 a.m., 40 km (b) 10 a.m., 60 km (c) 9 a.m., 60 km (d) None of these
- There were 35 students in a hostel. If the number of students increases by 7, the expenses of the mess increase by ` 42 per day while the average expenditure per head diminishes by ` 1. Find the original expenditure of the mess ?
(a) ` 420 (b) ` 640 (c) ` 360 (d) ` 480
- If you are facing North-East and move 10 m forwards turn left and move 7.5 m, then you are
(a) North of your initial position. (b) South of your initial position.
(c) East of your initial position. (d) Both (c) and (d)
- Ramesh has 6 friends. In how many ways can he invite one or more of them at a dinner ?
(a) 50 (b) 60 (c) 63 (d) 70

COMMON DATA QUESTIONS FOR Q.11 TO Q.15:

Table shows the percentage marks obtained in five different subjects by five different students and maximum marks of each subjects respectively.

Student	Hindi (80)	English (60)	History (50)	Science (100)	Math (150)
J	80	75	—	75	80
K	70	80	60	65	—
L	—	70	70	60	85
M	55	—	80	—	90
N	—	60	90	80	70



11. If marks obtained by J in History is 20 % less than the mark obtained by K in the same subject, then find the mark obtained by 'J' in History ?
 (a) 25 (b) 35 (c) 30 (d) 24
12. If total marks obtained by M in all the five subjects is 338 and marks obtained in English is 20% less than the marks obtained by J in English, then find the mark obtained by M in Science ?
 (a) 75 (b) 80 (c) 83 (d) 70
13. If average mark obtained by all the five students in English is 70 %, then find the missing data in English ?
 (a) 70 % (b) 65 % (c) 75 % (d) 80 %
14. What is the total marks obtained by all the students in Math, if marks obtained by J in Science is 20 % less than that of marks obtained by K in Math ?
 (a) 547.5 (b) 562.5 (c) 550 (d) 438.75
15. If N obtained 10 % less marks in Hindi than that of K in the same subject, then find the approx. average mark obtained by N in all subjects ?
 (a) 57 (b) 63 (c) 71 (d) 75
16. Which of the following steps would you consider first for an effective communication ?
 (a) Select the channel of communication. (b) Plan the evaluation procedure.
 (c) Specify the objectives of communication. (d) Identify various media for communication.
17. Communication will be effective
 (a) If it is delivered slowly and clearly. (b) If it is delivered in a calm situation.
 (c) If it reaches the receiver completely. (d) If it reaches the receiver as intended by the sender.
18. A negative reaction to a mediated communication is described as
 (a) Flak (b) Fragmented feedback
 (c) Passive response (d) Non-conformity
19. Which of the following cannot be a good way in promoting literacy among villagers ?
 (a) Demonstration
 (b) Reading and writing
 (c) Providing material on TV and film projector
 (d) Large group discussion
20. Which of the following statement(s) is/are true in context of paraphrasing ?
 (1) It is basically about stating in your own words, your understanding of what has just been said.
 (2) It gives speaker opportunity to find out what message s/he is getting across to you.
 (a) Only (1) (b) Only (2) (c) Both (1) and (2) (d) Neither (1) nor (2)
21. If population growth follows a logistic curve, the maximum sustainable yield
 (a) is equal to half the carrying capacity. (b) is equal to the carrying capacity.
 (c) depends on growth rates. (d) depends on the initial population.
22. The structure of Earth's system consists of the following:
 Match the following:
List-1 (Zone)
 A. Atmosphere
 B. Biosphere
 C. Hydrosphere
 D. Lithosphere
List-2 (Chemical character)
 1. Inert gases
 2. Salt, fresh water, snow, and ice
 3. Organic substances
 4. Light silicates
 Codes:
 (a) A-2, B-3, C-1, D-4 (b) A-1, B-3, C-2, D-4
 (c) A-2, B-1, C-3, D-4 (d) A-4, B-2, C-3, D-1

23. The plume rise in a coal-based power plant depends on
 I. Buoyancy
 II. Atmospheric stability
 III. Momentum of exhaust gases
 Codes:
 (a) I and II only (b) II and III only (c) I and III only (d) All of these
24. With the absorption and decomposition of CO_2 in ocean water and beyond desired level, there will be
 (a) decrease in temperature (b) increase in salinity
 (c) Growth of phytoplanktons (d) rise in sea level
25. Chemical weathering of rocks is largely dependent on
 (a) High temperature (b) Strong wind action (c) Heavy rainfall (d) Glaciation
26. Networking of libraries through electronic media is called
 (a) Infibnet (b) Libinfnet (c) The internet (d) HTML
27. Who among the following was the first Education Minister of independent India ?
 (a) Abul Kalam Azad (b) S. Vallabhbhai Patel
 (c) S. Radhakrishnan (d) None of the above
28. Which is the best Central University as per list of NIRF-2019 ?
 (a) Jawaharlal Nehru University (b) Pondicherry University
 (c) Vishwa Bharati University (d) Banaras Hindu University
29. Which of the following is known as the Magna carta of Indian Education ?
 (a) Macaulay Minute (b) Wood's Despatch
 (c) Hunter Commission (d) Sadler Commission
30. Who introduced Indian University Act ?
 (a) Lord Curzon (b) Lord Minto (c) Lord Hardinge (d) Lord Chelmsford
31. Match List-I with List-II
- | List -I (Teaching mixims) | List-II (Main proponents) |
|---------------------------|-----------------------------|
| A. From whole to part | I. Gestalt psychologists |
| B. Self-study | II. Dalton |
| C. Training of senses | III. Montessori and Froebel |
- Codes:
 (a) A-I, B-II, C-III (b) A-I, B-III, C-II
 (c) A-II, B-III, C-I (d) A-II, B-I, C-III
32. A new teacher to start with will have to
 (a) Enforce discipline in class (b) Establish rapport with the students
 (c) Cut jokes with the students (d) Tell the students about his qualifications
33. Which of the following is a teaching aid?
 (a) LCD projector (b) Gree board (c) Tape recorder (d) All of the above
34. The psychological aspects of the classroom are best managed by
 (a) The class teacher (b) The subject teacher (c) The principal (d) The student themselves
35. CAI stands for
 (a) Computer-analysed instruction (b) Computer-assisted instruction
 (c) Computer-assisted intelligence (d) None of the above

36. Which of the following options are the maintasks of research in modern society?
 I. To keep pace with the advancement in the knowledge
 II. To discover new things
 III. To write a critique on the earlier writings.
 IV. To systematically examine and critically analyze the investigations/sources with objectivity
 (a) IV, II and I (b) I, II and III (c) I and III (d) II, III and IV
37. Match List A with List B and choose the correct answer from the code given below:
- | List I | List II |
|-------------------------|---------------------|
| A. Historical method | I. Past events |
| B. Survey method | II. Vision |
| C. Philosophical method | III. Present events |
| D. Experimental method | IV. Future action |
- (a) A-I, B-III, C-II, D-IV (b) A-I, B-II, C-III, D-IV
 (c) A-I, B-II, C-III, D-IV (d) A-II, B-III, C-I, D-IV
38. The first step of research is
 (a) Selecting a problem (b) Searching a problem
 (c) Finding a problem (d) Identifying a problem
39. Which of the following statement is correc?
 (a) Objectives should be pin-pointed
 (b) Objectives can be written in statement or question forms
 (c) Another word for problem is variable
 (d) All of the above
40. A statistical technique used for large number of variables of establish whether there is a tendency of groups to be interrelated is
 (a) Simple correlation (b) Multiple correlation (c) Factor analysis (d) None of the above

READ THE FOLLOWING PASSAGE CAREFULLY AND ANSWER THE QUESTIONS 41 TO 45:

Though top leaders of the nationalist movement were the policy makers, the immediate day-to-day leadership was provided by the middle-class intellectuals. The rural origin of the industrial labour force together with rampant illiteracy and their simplistic docility attracted soical worker, mainly drawn from the middle-class intellectuals. They had an obvious advantage. Not being employees, the leaders were free from fear of victimization and immune towards the risks of leadership. Being generally well educated, they had a better perspective and sense of organization. They belonged to a higher social plane than the workers and with good education intellectual development comparable to the best among the employers they could meet the employers on their own plane and carry on negotiations on an equal footing. According to Royal Commission on Labour in India, 'the effect of this surge was enhanced by the political turmoil which added to the prevailing feelings of unrest and assured to provided willing leaders of a trade union movement'. But outside leadershilp had lead to the politicization of the movement.

Politicization of the labour movement in India contributed both to its strength and weekness. While economic hardship was present all along as a latent force, the major impetus for growth of unionism was primarily provided by major political currents, particularly movement for national independence. For the zeal and the organizing ability, which the leaders of the nationalist movement brought to bear upon the Indian Trade Union Movement, it would not have gained the dimensions and the position it had by 1909 within a decade of its formal start.

41. Leadership to Trade Union was provided by the middle-class intellectuals in Indian because
 (a) They were the active participants in the nationalist movement
 (b) They were literates among the workers.
 (c) They were able to negotiate with employers on equal terms
 (d) The worker did not want any one among them to be their leader
42. During the early years, Trade Union Movement gained greater dimensions because
 (a) The worker accepted outside leaders
 (b) It started along with the independence movement
 (c) The leaders were well educated with broad perspectives
 (d) The leaders were devoted to the welfare of workers
43. Early history of trade union movement in India
 (a) Trade union Movement in India.
 (b) Royal Commission on Trade Union Movement.
 (c) Outside leadership to trade union.
 (d) Negotiation with employers.
44. What would be the reason for worker not coming forward to take up the leadership in Trade Union Movement in the early year?
 (a) Lack of time (b) Illiteracy
 (c) Fear of victimization (d) Risk in leadership
45. According to the passage, which of the following leadership primarily led to the politicization of the movement?
 (a) India leadership (b) Outside leadership (c) Both (a) and (b) (d) Illiterate leadership
46. In the following what is/are digital initiative of Government of India in higher education?
 (I) MOOCs (II) Swayam Prabha (III) NDL (IV) E-acharya
 (a) I, II, III (b) II, III, IV (c) I, III, IV (d) All of these
47. Which of the following is/are incorrect match in ICT.
 I. CCNA → Cisco certified network professional
 II. BIOS → Basic Input and output session
 III. PCI → Peripheral component Internet
 IV. SMS → Short message system
 (a) I, II, IV (b) II, III, IV (c) I, III, IV (d) All of these
48. What is decimal equivalent of hexadecimal number +19 FDE.
 (a) 106460 (b) 106462 (c) 106464 (d) 106468
49. A permanent memory which holds data and instruction for startup PC and does not erase data after power off.
 (a) NIC (b) CU (c) RAM (d) ROM
50. POP3 is simple protocol and limited to which of the following service?
 (a) Usage (b) Server (c) Reliability (d) Functionality

PAPER – II

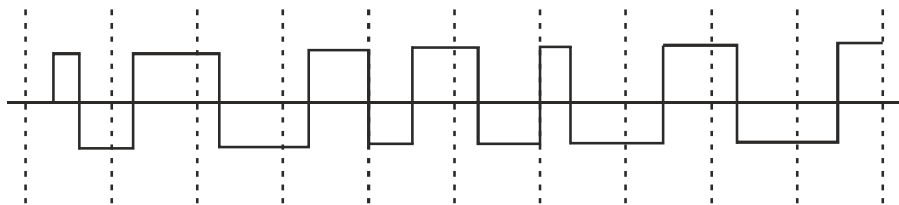
51. What is size of bandwidth is required to send 132 voice-grade channels by FDM on artificial satellite system ?
 (a) 500 MHz (b) 10 MHz (c) 1320 MHz (d) None of these
52. Let an IPv4 frame has been arrived at the receiver with following fields.
 HLEN = 8, total length = 300, fragment offset = 100 and MF = 0.
 The identify the correct option corresponds to this frame.
 (a) 80 (initial byte), 1068 (last byte), Last fragment.
 (b) 80 (initial byte), 1067 (last byte), Middle fragment.
 (c) 80 (initial byte), 1067 (last byte), Last fragment.
 (d) 100 (initial byte), 1068 (last byte), Last fragment.
53. Match the following :
- | List-I | List-II |
|---------------|--|
| (i) Router | (a) Translates different protocols |
| (ii) Gateway | (b) It is combined switch |
| (iii) Brouter | (c) Regenerate Signal |
| (iv) Repeater | (d) Source to destination delivery of packet |
- Codes:
- | | |
|------------------------------------|------------------------------------|
| (a) i – d, ii – a, iii – b, iv – c | (b) i – a, ii – d, iii – b, iv – c |
| (c) i – d, ii – d, iii – c, iv – b | (d) i – d, ii – c, iii – b, iv – a |
54. In a good software design, coupling and cohesion are desirable between modules?
 (a) Highest,Lowest (b) Lowest,Highest (c) Internal,External (d) External,Internal
55. Problems with waterfall model are:
 1. Real projects rarely follow this model proposes
 2. It is often difficult for the customer
 3. Working model is available only in the end
 4. Developers are delayed unnecessarily
 Which of the following is true?
 (a) 1 and 4 only (b) 2 and 3 only (c) 1, 2 and 3 only (d) 1, 2, 3 and 4
56. Identify the incorrect statement:
 (i) The internet has evolved into phenomenally successful e-commerce engine
 (ii) e-business is synonymous with e-commerce
 (iii) The e-commerce model B2C did not begin with billboard ware
 (iv) The e-commerce model G2C began with billboard ware
 (a) I, II, III (b) I, III, IV (c) I, II, IV (d) All of these
57. If a class B network is divided into 8 subnetwork. Then the subnet mask of created subnetworks will be
 (a) 255.255.248.0 (b) 255.255.240.0 (c) 255.255.255.0 (d) None of these
58. Match the followint
- | List-I | List-II |
|--------------------------|---|
| A. Application layer | 1. Implement routing algorithm |
| B. Network layer | 2. Provides different levels of security |
| C. Transport layer | 3. Perform segmantation and re-assembly |
| D. Host to network layer | 4. Provides bits and frame level transmission |
- | | |
|------------------------|------------------------|
| (a) A-2, B-1, C-4, D-3 | (b) A-3, B-1, C-4, D-2 |
| (c) A-2, B-4, C-1, D-3 | (d) A-1, B-2, C-3, D-4 |

59. Agile methodology follow which of systems.
 I. Collaborative effort of self organizing and cross-functioning
 II. Iterative model
 III. Incremental model
 IV. Error are fixed during the middle of the phase
 (a) I, II, IV (b) II, II, IV (c) I, III, IV (d) All of these
60. A software having 3 modules if reliability of each module is 0.9. Then what is reliability of the software?
 (a) 0.629 (b) 0.729 (c) 0.829 (d) None of these
61. IF A and B are two events such that $P(A) = 0.5$ $P(B) = 0.6$ and $P(A \cup B) = 0.8$ find $P(A/B)$
 (a) 0.05 (b) 0.4 (c) 0.5 (d) 1
62. Which of the following statement is FALSE?
 (a) Constraint satisfaction Search problem can be used to solve map coloring problem.
 (b) Means End Analysis finds the central difference between the initial state and goal state and then apply the operator to reduce the difference.
 (c) Simple hill climbing apply all the operator to generate all the successors and pick the best among them.
 (d) Hill climbing suffers with the local maxima, plateau and ridge problems
63. If class $-C_1$ consists points $P_1(0, 0)$ and class $-C_2(0, 1), (1, 1)$ and $(1, 0)$, then which line is used to separate both classes ?
 (a) $x_1 + x_2 = 1$ (b) $2x_1 + 2x_2 = 1$ (c) $x_1 + 2x_2 = 2$ (d) None of these
64. If mid-point crossover between chromosomes in search space does not produce significantly different children, what does it infer?
 (i) The crossover operation is not successful.
 (ii) Solution is about to be reached.
 (iii) Diversity is so poor that the parents involved in the crossover operation are similar.
 (iv) The search space of the problem is not ideal for Genetic sAlgorithm to operate.
 (a) (ii), (iii) & (iv) only (b) (ii) & (iii) only (c) (i), (iii) & (iv) only (d) All of these
65. RAID level 5 is also known as:
 I. Bit-interleaved parity organization.
 II. Block-interleaved parity organization.
 III. Block-interleaved distributed parity.
 Which of the following is/are not TRUE?
 (a) III only (b) I and II only (c) II only (d) I only
66. The normalization of a fuzzy set

$$A = \left\{ \frac{x_1}{0.2}, \frac{x_2}{0.4}, \frac{x_3}{0.5}, \frac{x_4}{0.7}, \frac{x_5}{0.8}, \frac{x_6}{0.95} \right\}$$

 (a) $\left\{ \frac{x_1}{0.21}, \frac{x_2}{0.42}, \frac{x_3}{0.52}, \frac{x_4}{0.28}, \frac{x_5}{0.85}, \frac{x_6}{1} \right\}$ (b) $\left\{ \frac{x_1}{0.21}, \frac{x_2}{0.42}, \frac{x_3}{0.52}, \frac{x_4}{0.74}, \frac{x_5}{0.84}, \frac{x_6}{1} \right\}$
 (c) $\left\{ \frac{x_1}{0.25}, \frac{x_2}{0.42}, \frac{x_3}{0.52}, \frac{x_4}{0.75}, \frac{x_5}{0.85}, \frac{x_6}{1} \right\}$ (d) None of these
67. What are the different types of data-warehousing?
 (a) Enterprise Datawarehousing (b) Operational Data Store
 (c) Data Mart (d) All of these

68. A web-server with a CPU being 40 times faster on computation than the previous web-server. I/O performance is not improved compared to the old machine. The web-server spends 60% of its time in computation and 40% in I/O. What is speedup?
 (a) 1.64 (b) 3.64 (c) 4.64 (d) None of these
69. _____ is the difference between the cumulative earned value of the work performed and the cumulative actual cost. It is also the difference between BCWP (=earned value) and ACWP (Actual cost of Work Performed).
 (a) Cost performance index (b) Cost variance
 (c) Budgeted costs (d) Cost quality index
70. All of the following are traditional project management techniques for scheduling and planning *except*
 (a) CPM (b) PLAN (c) Gantt Chart (d) PERT
71. If we are dealing with a problem in 10 variables and 5 constraints, what is an upper bound for the number of basic feasible solutions?
 (a) 1550 (b) 1504 (c) 1508 (d) None of these
72. Match the following
- | List-I | List-II |
|------------------------|--------------------------------|
| P. α – testing | 1. Design errors |
| Q. β – testing | 2. Coding errors |
| R. Unit testing | 3. Developer side team testing |
| S. Integration testing | 4. Friendly customer testing |
| (a) P-3, Q-4, R-2, S-1 | (b) P-2, Q-4, R-3, S-1 |
| (c) P-4, Q-3, R-2, S-1 | (d) P-1, Q-4, R-2, S-3 |
73. If given COCOMO model constants are 3.2, 1.20. If number of line code is 32000 lines. Then compute effort by using COCOMO model?
 (a) 201 PM (b) 203 PM (c) 205 PM (d) 215 PM
74. Match the following
- | List-I | List-II |
|------------------------|------------------------|
| P. CMM 2 | 1. Integration |
| Q. CMM 3 | 2. Managed |
| R. CMM4 | 3. Defined |
| S. CMM I | 4. Measured |
| (a) P-1, Q-3, R-4, S-2 | (b) P-2, Q-4, R-3, S-1 |
| (c) P-2, Q-3, R-4, S-1 | (d) P-1, Q-3, R-4, S-2 |
75. What is data by using machester coding scheme?



- (a) 1010011101 (b) 1010011110 (c) 1010011100 (d) 1010011111
76. In the stop wait protocol each 4th packet is damaged and we required to again send 10 packets. Calculate number of transmission required to send all packets.
 (a) 11 (b) 13 (c) 15 (d) None of these

77. If two prime numbers p and q are 17 and 11. If encryption key is 23. If plain text is 11. Then what is cipher text.
 (a) 80 (b) 84 (c) 88 (d) None of these
78. Consider the statements as below:
 S1: Vertical microprogramming uses 1 bit for each control signal.
 S2: Horizontal microprogramming doesn't require the use of signal decoders.
 True statement(s) are:
 (a) S1 only (b) S2 only (c) Both S1 and S2 (d) None of these
79. What is/are advantage of mobile computing are mobile databas?
 I. This present security Hazzards.
 II. Accessed anywhere
 III. Data with seamless delivery
 IV. It requires little support with mainframe
 (a) I, II, III (b) II, III, IV (c) I, III, iV (d) All of the these
80. Match the following codes
 List-I
 P. Synchronization primitive
 Q. Producer-consumer problem
 R. Dinning-philosopher's
 Codes:
 (a) P-I, Q-II, R-III
 (c) P-II, Q-I, R-III
 List-II
 1. Classical IPC problem
 2. Read/write problem
 3. Bunded buffer problem
 (b) P-II, Q-III, R-I
 (d) None of these
81. What are feautres on NOSQL?
 I. NOSQL DB never follows the relation model.
 II. Provides tables with fixed column ready
 III. Does not require object relation mapping
 (a) I, II (b) II, III (c) I, III (d) All of the these
82. Consider the following program:

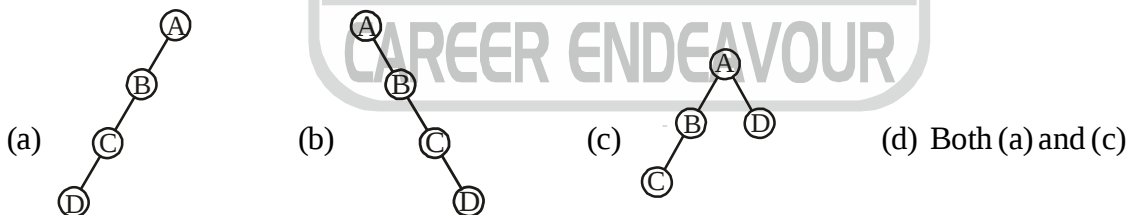
```
int func(int n)
{
    if (n == 1)
        return n;
    else
        return (func (n - 1) * func (n - 1));
}
```

 Find time complexity for above program when $\text{func}(n)$ is called without dynamic programming and with dynamic programming respectively?
 (a) $O(n^2)$ and $O(2^n)$ (b) $O(n 2^n)$ and $O(2^n)$ (c) $O(2^n)$ and $O(n)$ (d) $O(n)$ and $O(2^n)$
83. Consider the following algorithm:
 Fill in the line no. 9, 10 and 12, 13 to achieve binary search?
 A: A sorted array
 x: Element to be searched
 n: Maximum index of array
 1. $\ell \leftarrow 0$ 2. $u \leftarrow n$
 3. If $x < A[\ell]$ or $x > A[u]$ then return -1 4. While ($\ell < u$)

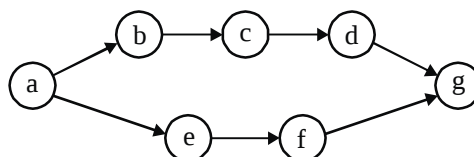
5. $m \leftarrow \left\lceil \frac{\ell+u}{2} \right\rceil$
 7. print found and return
 9. _____
 11. else
 13. _____
 15. /* end of while */
 6. If $x == A[m]$
 8. else if $x < A[m]$
 10. _____
 12. _____
 14. $\ell++$
 16. print not found

- (a) 9. $\ell \leftarrow m+1$; 10. $u \leftarrow n$; 12. $\ell \leftarrow 0$; 13. $u \leftarrow m-1$
 (b) 9. $\ell \leftarrow 0$; 10. $\ell \leftarrow m+1$; 12. $u \leftarrow m-1$; 13. $u \leftarrow n$
 (c) 9. $\ell \leftarrow 0$; 10. $u \leftarrow m-1$; 12. $\ell \leftarrow m+1$; 13. $u \leftarrow n$
 (d) 9. $u \leftarrow n$; 10. $\ell \leftarrow m+1$; 12. $\ell \leftarrow 0$; 13. $u \leftarrow m-1$

84. Find postfix expression of infix expression $a - b + c - d - f \wedge g \wedge h * i$
 (a) $ab - c + d - f g h \wedge \wedge i * -$ (b) $ab + c - d - f g h \wedge \wedge i * -$
 (c) $ab - c - d - f g h \wedge \wedge i * +$ (d) $ab - c + d - f g h \wedge * i \wedge -$
 85. What will be the worst case time complexity for best algorithm to delete a node from a stack implemented using linked list.
 (a) $O(n)$ (b) $O(\log n)$ (c) $O(1)$ (d) None of these
 86. If x is the length of LCS of the strings "careergrowth" and "atendearour" Then what is the value of $2x + 5$?
 (a) 13 (b) 15 (c) 17 (d) None of above
 87. Which of the following permutations can not be obtained in output (in same order) using stack assuming that the input sequence is as 5, 6, 7, 8, 9
 (a) 5, 6, 7, 8, 9 (b) 6, 8, 7, 5, 9 (c) 8, 7, 5, 9, 6 (d) None of these
 88. A complete m -ary tree is one in which every node has 0 or ' m ' sons. If ' i ' is the number of internal nodes of a complete m -ary tree, the number of leaves in it given by
 (a) $im - 1$ (b) $i(m - 1) + 1$ (c) $im + 1$ (d) $i(m + 1)$
 89. Which of following tree has same preorder and inorder traversal?



90. In a ternary tree, number of internal nodes of degree 1, 2 and 3 is 4, 3 and 4 respectively. The number of leaf nodes in the ternary tree is
 (a) 10 (b) 11 (c) 12 (d) 13
 91. Consider the following directed graph:



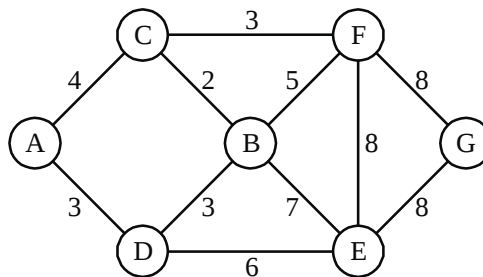
The number of different topological ordering of the vertices of graph is

- (a) 6 (b) 8 (c) 10 (d) 16

92. Which of the following is correct regular expression for language having atleast 2 'a' ?

- (a) $(a + b)^* a(a + b)^* a(a + b)^*$ (b) $b^* a(a + b)^* ab^*$
 (c) Both (a) and (b) (d) None of these

93. Find the number of MST of following weighted graph:



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

94. In a heap with n elements with the smallest element at the root, the 15th smallest element can be found in time

- (a) $\theta(1)$ (b) $\theta(\log n)$ (c) $\theta(n)$ (d) $\theta(n \log n)$

95. If regular expression is given as $re = \phi$, then which of the following is TRUE ?

- (a) $L(re) = \{ \}$ (b) $L(re) = \{\epsilon\}$ (c) Both (a) and (b) (d) None of these

96. Which of the following is/are TRUE ?

- (i) If NFA contains n states, then equivalent DFA will contain atmost 2^n states.
 (ii) If NFA contains n states, then equivalent DFA will contain atleast 2^n states.
 (iii) If a mealy machine has m states and n output, then equivalent moore machine will contain atmost mn states.
 (iv) If a mealy machine has m states and n output, then equivalent moore machine will contain atleast mn states.
 (a) (i) and (ii) only (b) (ii) and (iii) only (c) (iii) and (iv) only (d) (i) and (iii) only

97. If L_1 is CFL and L_2 is CSL, then $L = (L_1 \cap L_2)$ is

- (a) CFL (b) DCFL (c) CSL (d) REC

98. Consider the following CFG, where A is start symbol

$$A \rightarrow aB \mid bC \mid BCD \mid \epsilon$$

$$B \rightarrow aAb \mid \epsilon$$

$$C \rightarrow bCa \mid \epsilon$$

$$D \rightarrow dD \mid d$$

Which of the following string is/are generated by above grammar ?

- (a) *abbbbaadd* (b) *abbbbaad* (c) both (a) and (b) (d) None of above

99. What will be the grammar for the following DCFL ?

$$L = \{a^m b^n c^p \mid n + m = p \text{ and } m, n \geq 0\}$$

$$S \rightarrow aSc \mid A$$

- (a) $A \rightarrow bAc \mid \epsilon$ (b) $S \rightarrow aSc \mid A$ (c) $S \rightarrow aSc \mid aAc$ (d) None of above
 $A \rightarrow bAc \mid bc$ $A \rightarrow bAc \mid \epsilon$

100. Consider the following language:

- (i) $L = \{a^m b^n \mid m + n = 10\}$ (ii) $L = \{a^m b^n \mid m \times n \leq 10\}$ (iii) $L = \{a^m b^n \mid m = n \text{ and } m, n \geq 0\}$

Which of the following is false?

- (a) (i) and (ii) are Regular and (iii) is CSL (b) (ii) and (iii) are CFL and (i) is Regular
 (c) (i) and (ii) are Regular and (iii) is CFL (d) All are Regular.

101. Consider the following grammar:

$$A \rightarrow aBbAC \mid a$$

$$C \rightarrow cA$$

$$B \rightarrow d$$

Which of the following option is/are false with respect to the grammar ?

- (a) Grammar is LL (1) (b) Grammar is not SLR (1)
(c) Both (a) and (b) (d) None of above

102. Consider the C program given below:

```
main()
{
    a = a * b;
    c = a / c;
    d = c + d;
    a = c * d;
    printf ("%d", a);
}
```

What will be the minimum number of nodes and edges present in the DAG representation of the output of above C program ?

- (a) (8, 8) (b) (9, 10) (c) (9, 11) (d) None of above

103. Consider the following grammar G

$$S \rightarrow A = B$$

$$B \rightarrow C/B + C$$

$$C \rightarrow A/\text{int}/(A)/\epsilon$$

$$A \rightarrow \text{id}$$

What are FIRST (C) and Follow (C) of above grammar?

- (a) FIRST (C) = {id, int, (, ϵ }, Follow (C) = {+, \$,)}
(b) FIRST (C) = {+,), id, int}, Follow (C) = {+,), \$}
(c) FIRST (C) = {id, int, (, ϵ }, Follow (C) = {+, \$}
(d) None of above

104. Consider the following statements.

S1: JAVA does not support multiple inheritance, but can implement multiple interface.

S2: JAVA class can have more than one function having same name.

Which of the statements is/are true?

- (a) S1 only (b) S2 only (c) S1 and S2 (d) Neither S1 nor S2

105. Consider the following statements

S1: Static variable in C language does not change in run time.

S2: Static variable in C language only can be initialized at compile time.

S3: If a C program use extern variable then this variable should also be declared globally.

- (a) S1 and S2 only (b) S2 and S3 only (c) S1 and S3 only (d) All are true.

106. Match the following

List-I

I. break

II. exit

III. return

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

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

List-II

A. Exits from loop

B. Exits from program

C. Exits from function

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

(d) None of above

107. Consider the following statements

S1: JSP is server side programming language

S2: JavaScript is client side programming language

S3: Fundamental HTML block is known as HTML attribute

Which of the following statements is/are True?

(a) S1 and S2 only

(b) S2 and S3 only

(c) S2 and S3 only

(d) All three statements

108. Consider the following C++ program

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

What will be the output of above program?

(a) Career

(b) Endeavour

(c) CareerEndeavour

(d) None of above

109. Assuming in synchronous TDM system, there are 8 input lines each send data at 100 kbps. If one time slot of each input line contains 4 bits. Then identify the correct option among the following?

(a) Frame rate = 25 K frame/sec, Input slot = 10 μ sec

(b) Frame rate = 50 K frame/sec, Input slot = 1 μ sec

(c) Frame rate = 100 K frame/sec, Input slot = 1 μ sec

(d) Frame rate = 800 K frame/sec, Input slot = 10 μ sec

110. In the PERT chart for the activity described above with probabilistic completion times of 20, 30 and 46, what is the variance of the completion time?

(a) 15.44

(b) 18.78

(c) 33.33

(d) None of these

111. Four jobs to be executed on a single processor system arrive at time 0⁺ in the order P, Q, R, S. Their burst CPU time requirement are 8, 4, 9, 5 time unit respectively. The completion time of Q under round Robin scheduling with time slice of one unit is

(a) 12

(b) 13

(c) 14

(d) None of these

112. Consider the following statements

I. $(p \wedge q) \rightarrow (p \rightarrow q)$

II. $(\neg p \wedge (p \rightarrow q)) \rightarrow \neg q$

III. $(\neg q \wedge (p \rightarrow q)) \rightarrow \neg p$

Which of the following are Tautologies?

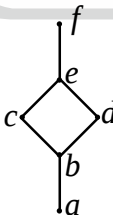
(a) II only

(b) I and II only

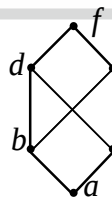
(c) Only I and III

(d) III only

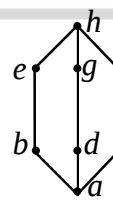


113. Given that
 $B(x)$ means "x is a bat",
 $F(x)$ means "x is a fly", and
 $E(x,y)$ means "x eats y",
 What is the best English translation of:
 $\forall x (F(x) \rightarrow \forall y (E(y,x) \rightarrow B(y)))$?
- (a) every fly is eaten by some bat (b) bats eat only flies
 (c) every bat eats flies (d) only bats eat flies
114. Consider the statements on sets:
 I. Cartesian product of $A \times B = B \times A$ (given $A \neq B$ and nonempty)
 II. Cartesian product of $(A \times B) \times C \neq A \times B \times C$
 III. $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
 Which of the following statements are TRUE?
 (a) I and II only (b) II and III only (c) I and III only (d) II only
115. If G is a simple graph with n vertices, then the union of G and G^c is:
 (a) W_n , W denoting wheels (b) K_n , Complete Graph
 (c) C_n , Denoting cycles (d) D
116. Which of these relations on $\{0,1,2,3\}$ are equivalence relation?
 I. $\{(0,0), (1,1), (2,2), (3,3)\}$
 II. $\{(0,0), (0,2), (2,0), (2,2), (2,3), (3,2), (3,3)\}$
 III. $\{(0,0), (1,1), (1,2), (2,1), (2,2), (3,3)\}$
 IV. $\{(0,0), (1,1), (1,3), (2,2), (2,3), (3,1), (3,2), (3,3)\}$
 (a) I only (b) II and III only (c) I and III only (d) None of these
117. Consider the three diagrams given below :
- 

(A)



(B)



(C)
- Which of the following diagrams are lattices ?
 (a) A only (b) A and C only (c) A and B only (d) B only
118. Z is the set of integers $(z, *)$ is a group with $a * b = a + b + 1$, $a, b \in G$. Then inverse of a is
 (a) $-a$ (b) $a + 1$ (c) $-2 - a$ (d) None of these

119. Match the following with reference to unix shell scripts:

List-I

P. \$?

Q. \$#

R. sh

S. brk

Code:

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

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

List-II

1. To increase or decrease the size of the data region

2. Escapes unix cell

3. The number of arguments

4. Exit status of last command

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

(d) None of these

120. Consider the statements about threads:

I. Operating system recognizes User level Threads

II. Context switching time is more in Kernel level threads

III. If one user level thread perform blocking operation then entire process will be blocked.

IV. If one kernel thread perform blocking operation then other threads are not blocked.

Which of the following is/are FALSE?

(a) IV only

(b) II and III only

(c) I only

(d) I, III and IV only

121. Given N processes to be scheduled on one processor, how many different schedules are possible:

(a) N^2

(b) 2^N

(c) $N(N+1)/2$

(d) $N!$

122. Consider the following table:

Process	Arrival Time	Burst Time
P_1	0.0	8
P_2	0.4	4
P_3	1.0	1

Compute what the average turnaround time will be if the CPU is left idle for the first 1 unit and then SJF scheduling is used.

(a) 6.86

(b) 7.24

(c) 8.19

(d) 6.11

123. Four process P_1, P_2, P_3, P_4 has resources requirement of resource R_1, R_2 as $(4, 3), (2, 4), (3, 6), (2, 8)$.

What should be minimum instance of R_1 and R_2 to ensure system is deadlock free?

(a) 8, 16

(b) 8, 15

(c) 8, 17

(d) None of these

124. Consider a logical address space of 64 pages of 1024 words each, mapped onto a physical memory of 32 frames.

The number of bits in the logical address and the physical address respectively are:

(a) 15 and 16 bits

(b) 16 and 15 bits

(c) 12 and 13 bits

(d) 31 and 12 bits

125. Consider the following page reference string:

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.

Let the number of faults be n for LRU, m for FIFO and q for OPT, consider 4 frames are used.

Then the relationship between the three will be:

(a) $n > m; m > q; q < n$

(b) $n = m; m > q; q < n$

(c) $n < m; m > q; q < n$

(d) None of these

126. What is true about recoverable and cascadeless schedules?

I. All cascadeless schedules are also recoverable schedules

II. All recoverable schedules are also cascade less schedules

III. All strict schedules are cascadeless and recoverable

IV. All cascadeless and recoverable schedules are strict schedules

(a) I and III are correct

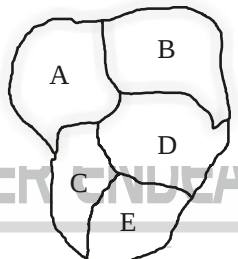
(b) I and IV are correct

(c) I, III and IV are correct

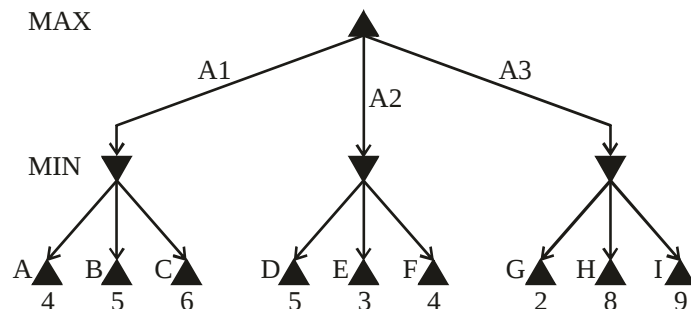
(d) I, II and IV are correct



127. Choose the correct statement related to database languages.
 (a) The output of DDL is placed in the data dictionary which contains meta-data.
 (b) DML helps in alteration to the table.
 (c) DDL helps in insertion of records to the table.
 (d) None of the above
128. Choose the correct SQL command to display the customer name and loan number of customers who have a loan from bank and whose name starts with 'A'. Primary keys are underlined in the schema.
 borrower(customer_name, loan_number)
 (a) SELECT * FROM borrower WHERE customer_name = 'A';
 (b) SELECT * FROM borrower WHERE customer_name LIKE 'A%';
 (c) SELECT * FROM borrower WHERE customer_name LIKE '%A';
 (d) SELECT * FROM borrower WHERE customer_name LIKE 'A%';
129. Choose the INCORRECT statement from the following.
 (a) Data Dictionary stores the information about schema definition.
 (b) Data Dictionary stores the information about Integrity constraint on a relation.
 (c) Data Dictionary does not store user and accounting information of a database.
 (d) Data Dictionary stores the information about File Organization.
130. Choose the option that is incorrect among the following where E_1, E_2 , and E_3 are relational algebra expressions.
 (a) $E_1 - E_2 = E_2 - E_1$ (b) $E_1 \cap E_2 = E_2 \cap E_1$
 (c) $(E_1 \cup E_2) \cup E_3 = E_1 \cup (E_2 \cup E_3)$ (d) $(E_1 \cap E_2) \cap E_3 = E_1 \cap (E_2 \cap E_3)$
131. Consider the Relation (ABCDEF) with dependencies $F: \{A \rightarrow C, C \rightarrow D, B \rightarrow E, E \rightarrow F\}$
 Find the 2 NF relations
 (a) ACDF, ABE (b) ACD, BEF (c) BEF, ABCD (d) ACD, BEF, AB
132. Match the following:
 P. Primary Index 1. Dense Index
 Q. Clustered Index 2. Require physical ordering of the rows and unique value in the column
 R. Secondary Index on key 3. Multi level index
 S. B/B+ tree index 4. Requires physical ordering of the rows and they are not unique in the column
- Codes:
 P Q R S
 (a) 2 1 4 3
 (b) 2 4 1 3
 (c) 2 3 4 1
 (d) 4 2 3 1
133. Consider a schedule $T1: R(X), T2: R(Y), T3: W(X), T2: R(X), T1: R(Y)$. If the schedule given is conflict or view serializable, then it is equivalent to which serial schedule.
 (a) $T1 \rightarrow T2 \rightarrow T3$ (b) $T1 \rightarrow T3 \rightarrow T2$ (c) $T3 \rightarrow T2 \rightarrow T1$ (d) $T2 \rightarrow T3 \rightarrow T3$

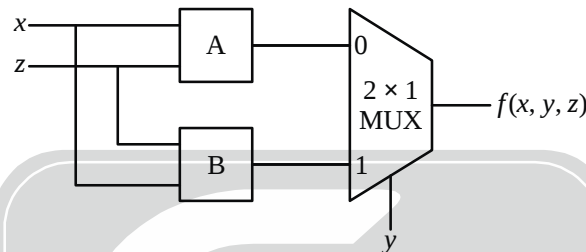
134. Which of the following statement is false?
 (a) Beam penetration method uses only one gun while Shadow mask approach uses 3 guns.
 (b) Random scan display draws smooth and continuous lines.
 (c) In DVST primary gun deposit the positive charge distribution on collector as the information of the image to be displayed on the screen.
 (d) Plasma panel devices are excellent as far as color reproduction, life expectancy and viewing angle is concern but they are fragile and uses lots of power.
135. Consider 3 raster system with resolution 640×480 , 1280×1024 , and 2560×2048 . How much storage is required for each system if 24 bits per pixel are to be stored?
 (a) 900 KB, 3.75 MB, 15 MB (b) 900 MB, 3.75 MB, 15 MB
 (c) 900 KB, 3.75 KB, 15 KB (d) None of the above
136. What is the equation of the straight line PQ where Q(3,5,8) and P(2,4,5)?
 (a) $x = 3 - t, y = 5 - t, z = 8 - 3t$ (b) $x = 3 + t, y = 5 + t, z = 8 + 3t$
 (c) $x = 2 + t, y = 4 + t, z = 5 + 3t$ (d) $x = 2 - t, y = 4 - t, z = 5 - 3t$
137. What is the perspective projection onto the plane $z = d$ where the center of projection is at origin(0, 0, 0)
 (a) $\begin{pmatrix} d & 0 & 0 & 0 \\ 0 & d & 0 & 0 \\ 0 & 0 & d & 1 \\ 0 & 0 & 0 & 1 \end{pmatrix}$ (b) $\begin{pmatrix} d & 0 & 0 & 0 \\ 0 & d & 0 & 0 \\ 0 & 0 & d & 1 \\ 0 & 0 & 0 & 0 \end{pmatrix}$ (c) $\begin{pmatrix} d & 0 & 0 & 0 \\ 0 & d & 0 & 0 \\ 0 & 0 & 1 & d \\ 0 & 0 & 0 & 1 \end{pmatrix}$ (d) $\begin{pmatrix} 0 & 0 & 0 & d \\ 0 & d & 0 & 0 \\ 0 & 0 & d & 1 \\ 0 & 0 & 0 & 1 \end{pmatrix}$
138. Which of the following statement is are true?
 (a) The resolution of two clauses is a horn clauses.
 (b) A clause containing 1 positive literal and atleast 1 negative literal is known as positive or definite horn clause.
 (c) A clause containing atmost one positive literal is called Horn clause
 (d) all of the above
139. Which are the possible color respectively of A,B,C,D,E
- 
- (a) Red, Blue, Green, Blue, Red (b) Blue, Red, Red, Green, Blue
 (c) Blue, Blue, Green, Blue, Red (d) Green, Red, Green, Blue, Blue
140. If $h_1(n)$ and $h_2(n)$ both are admissible heuristics then
 (a) $\text{Min}(h_1(n), h_2(n))$ is also admissible and dominates its components.
 (b) $\text{Sum}(h_1(n), h_2(n))$ is also admissible and dominates its components.
 (c) $\text{Avg}(h_1(n), h_2(n))$ is also admissible and dominates its components.
 (d) None of the above
141. If the heuristic is completely uninformative and edge cost all are same in A^* then A^* is equivalent to
 (a) BFS (b) DFS (c) UCS (d) Best First Search
142. Let MN and AB is the number of nodes examined in MinMax search and alpha beta pruning in game playing then which of the following is true?
 (a) $MN \leq AB$ (b) $MN \geq AB$ (c) $MN = AB$ (d) $MN = 2AB + 5$

143. Consider the following part of a two-player game tree.



If we apply the alpha beta pruning which of the following nodes will be pruned?

- (a) {G,H,I} (b) {A,D,G} (c) {C,E,I} (d) {F,H,I}
144. A Boolean function $f(x, y, z)$ takes the value '1' whenever majority of the variables x, y, z are '0', we are trying to implement this function ' f ' using a (2×1) -MUX and 2 logic gates labelled A and B as below. A and B could be replaced by



- (a) OR, AND (b) AND, OR (c) NAND, NOR (d) NOR, NAND
145. The minimal expression for $f(x, y, z)$ is

yz \ x	00	01	11	10
0	A		1	$\bar{A}$
1	1	$\bar{A}$	A	

- (a) $(y \oplus z)A + (x \oplus y)\bar{A}$ (b) $(y \odot z)A + (x \odot y)\bar{A}$
 (c) $(y \oplus z)A + (x \odot y)\bar{A}$ (d) $(y \odot z)A + (x \oplus y)\bar{A}$
146. Given $(2x7)_8 + (y65)_8 = (6yx)_8$, (x, y) pair that satisfies this equation to
 (a) (2, 3) (b) (4, 3) (c) (3, 2) (d) (3, 4)
147. The probability of getting an output of '1' in the truth table of n -variables EX-OR functions would be
 (a) less than 0.5 (b) equals 0.5 (c) greater than 0.5 (d) depends on value of n
148. 'TRAP' interrupt in 8085 microprocessor executes service routine from interrupt vector location
 (a) 0024H (b) 0034H (c) 0075H (d) 0000H
149. Average CPI for a programs consisting of 50 instructions on a 5-stage pipelined processor where 20 % instructions have one stall cycle each would be
 (a) 1.20 (b) 1.28 (c) 1.5 (d) None of these
150. Consider that the memory is byte addressable with size 32 bits and the program has been loaded starting from memory location 1000 (decimal). If an interrupt occurs while the CPU has been halted after executing the HALT instruction, the return address (in decimal) saved in the stack will be
 (a) 1028 (b) 1024 (c) 1020 (d) 1007



NTA-UGC-NET-COMPUTER SCIENCE & APPLICATIONS

Date: 28-11-2019

Test Series-C

ANSWER KEY

PAPER – I

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

PAPER – II

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

