SEAL

Subject Code: **9210/TFU-COMPSC/ELG-II** **SET - (A)** Question Booklet No. 650045

परीक्षा केन्द्राध्यक्ष की मोहर Seal of Superintendent of Examination Centre	परीक्षार्थी द्वारा बॉल-प्वाइण्ट पेन से भरा जाए To be filled in by Candidate by Ball-Point pen only अनुक्रमांक Roll No.	उत्तर-शीट का क्रमांक Sl. No. of Answer-Sheet
	घोषणा : मैंने नीचे दिये गये निर्देश अच्छी तरह पढ़कर समझ लिए हैं। **Declaration : I have read and understood the instructions given below.**	
वीक्षक के हस्ताक्षर (Signature of Invigilator)..... वीक्षक के नाम (Name of Invigilator)	अभ्यर्थी के हस्ताक्षर (Signature of Candidate)..... अभ्यर्थी का नाम (Name of Candidate)	

Paper : II Subject : COMPUTER SCIENCE AND APPLICATIONS Time : 2 Hours Maximum Marks : 200

इस प्रश्न-पुस्तिका में पृष्ठों की संख्या Number of Pages in this Question Booklet	24	इस प्रश्न-पुस्तिका में प्रश्नों की संख्या Number of Questions in this Question Booklet	100

INSTRUCTION TO CANDIDATES

1. Immediately after getting the Booklet read instructions carefully, mentioned on the front and back page of the Question Booklet and do not open the seal given on the right hand side, unless asked by the invigilator. Do not accept a booklet without sticker-seal and do not accept an open booklet. As soon as you are instructed to open the booklet in the first 5 minutes you should compulsorily tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately within 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.
2. Write your Roll No., Answer-Sheet No., in the specified places given above and put your signature.
3. Make all entries in the OMR Answer-Sheet as per the given instructions, otherwise Answer-Sheet will not be evaluated.
4. For each question in the Question Booklet choose only one correct/most appropriate answer, out of four options given and darken the circle provided against that option in the OMR Answer-Sheet, bearing the same serial number of the question. Darken the circle with **Black or Blue ball-point pen** only.
5. Darken the circle of chosen option fully, otherwise answers will not be evaluated.

   Example : (A) ● (C) (D) If (B) is correct answer.
6. There are 100 objective type questions in this Booklet. All questions are compulsory and carry 2 marks each.
7. Do not write anything anywhere in the Question Booklet or on the Answer-Sheet except making entries in the specified places. Rough work is to be done in the space provided in this booklet.
8. When the examination is over, original OMR Answer Sheet is to be handed over to the invigilator before leaving the examination hall, while the Question Booklet and carbon copy of the Answer-Sheet can be retained by the candidate.
9. There is no negative marks for incorrect answer.
10. Use of any calculator/log table/mobile phone is prohibited.

अभ्यर्थियों के लिए निर्देश

1. प्रश्न-पुस्तिका मिलते ही मुख पृष्ठ एवं अंतिम पृष्ठ में दिए गए निर्देशों को अच्छी तरह पढ़ लें। दाहिनी ओर लगी सील को वीक्षक के कहने से पूर्व न खोलें। स्टीकर सील के बगैर प्रश्न पुस्तिका या खुले हुये प्रश्न पुस्तिका को स्वीकार न करें। प्रश्न पुस्तिका को खोलने के लिए जैसा ही कहा जायेगा प्रथम 5 मिनिट में अनिवार्यत: मुख पृष्ठ पर अंकित पृष्ठों की संख्या एवं प्रश्नों की संख्या को पुस्तिका में पृष्ठों की संख्या एवं प्रश्नों की संख्या से मिलान कर लेवें। पृष्ठों/प्रश्नों का छूटना या पुन: मुद्रित हो जाना या क्रम में नहीं रहना या अन्य किसी विरोधाभास के कारण प्राप्त त्रुटिपूर्ण प्रश्न पुस्तिका को इन्हीं 5 मिनिट के अंदर बदलवा लेवें। इसके पश्चात न ही प्रश्न पुस्तिका बदला जा सकता है और न ही कोई अतिरिक्त समय दिया जायेगा।
2. ऊपर दिए हुए निर्धारित स्थानों में अपना अनुक्रमांक, उत्तर-पुस्तिका का क्रमांक लिखें तथा अपने हस्ताक्षर करें।
3. ओ.एम.आर. उत्तर-शीट में समस्त प्रविष्टियां दिये गये निर्देशानुसार करें अन्यथा उत्तर-शीट का मूल्यांकन नहीं किया जाएगा।
4. प्रत्येक प्रश्न के उत्तर हेतु प्रश्न-पुस्तिका में प्रश्न के नीचे दिए गए चार विकल्पों में से सही/सबसे उपयुक्त केवल एक ही विकल्प का चयन कर ओ.एम.आर. उत्तर-शीट में उसी विकल्प वाले गोले को, जो उस प्रश्न के सरल क्रमांक से सम्बंधित हो, **काले या नीले बॉल-प्वाइण्ट पेन** से भरें।
5. सही उत्तर वाले गोले को अच्छी तरह से भरें, अन्यथा उत्तरों का मूल्यांकन नहीं होगा।

   उदाहरण : (A) ● (C) (D) यदि (B) उत्तर सही है।
6. प्रश्न-पुस्तिका में 100 वस्तुनिष्ठ प्रश्न दिए गए हैं। प्रत्येक प्रश्न के लिए 2 अंक निर्धारित है। सभी प्रश्न अनिवार्य है।
7. प्रश्न-पुस्तिका तथा उत्तर-शीट में निर्दिष्ट स्थानों पर प्रविष्टियां भरने के अतिरिक्त कहीं भी कुछ न लिखें। रफ़ कार्य, इस पुस्तिका में उपलब्ध स्थान पर करें।
8. परीक्षा समाप्ति के उपरान्त तथा कक्ष छोड़ने के पूर्व मूल ओ.एम.आर. उत्तर-शीट वीक्षक को सौंपा जाए। प्रश्न-पुस्तिका एवं उत्तर-शीट की कार्बन कॉपी परीक्षार्थी अपने साथ ले जा सकते हैं।
9. ऋणात्मक मूल्यांकन नहीं किया जावेगा।
10. किसी भी तरह के कैलकुलेटर/लॉग टेबल/मोबाइल फोन का प्रयोग वर्जित है।

SEAL

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

COMPUTER SCIENCE AND APPLICATIONS - II

1. The simplified Boolean Function of $F(x, y, z) = \Sigma(3, 4, 6, 7)$ is :

   (i) $F = yz + x'z$

   (ii) $F = yz' + xz'$

   (iii) $F = yz + xz'$

   (iv) $F = y'z + xz'$

   (A) (i) and (ii)

   (B) Only (ii)

   (C) Only (iii)

   (D) (ii) and (iii)

2. What is the return type of the function Math.random() in Java ?

   (A) void

   (B) int

   (C) double

   (D) char

3. Write the recurrence relation for *c-merge-sort* on a list of 'n' integers and 'c' is the number of sub-problems.

   (A) $T(n) = cT(n/2) + O(n)$

   (B) $T(n) = cT(n/c) + O(n)$

   (C) $T(n) = cT(n/2) + c$

   (D) $T(n) = T(n/c) + O(c)$

4. Which package consists the Buffered Reader and Scanner Classes ?

   (A) java.io, java.util

   (B) java.io

   (C) java.util

   (D) None of the above

5. The E-R model is expressed in terms of :

   (i) entity sets

   (ii) relationship sets

   (iii) The set of attributes of entities

   (iv) Functional relationship

   (A) (i) and (ii)

   (B) (i), (ii) and (iii)

   (C) (ii), (iii) and (iv)

   (D) (i), (ii) and (iv)

6. Consider the Grammar G whose productions are given by

   $S \rightarrow 0SB \mid 0B$

   $B \rightarrow 1$

   then the Grammar G is in :

   (A) Chomeskian normal form grammar

   (B) Greibaach normal form grammar

   (C) Regular form grammar

   (D) Context sensitive form grammar

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

7. Let $Q(x)$ stand for $x \in X$ and let $R = \{X: \sim Q(x)\}$, then R is the set whose members are exactly those objects that are not members of themselves. It explain the following :

(A) Post correspondence problem

(B) Rice theorem for undecidability

(C) Russell's paradox

(D) None of the above

8. Space complexity of Depth-First Iterative Deepening Search is as follows, where b is the branching factor and d is the depth :

(A) $O(b^d)$

(B) $O(bd)$

(C) $O(b+d)$

(D) None of the above

9. _____ ensures that no more than the allocated number of people are allocated at any given time in software scheduling.

(A) Time allocation

(B) Effort validation

(C) Defined milestone

(D) Effort distribution

10. Which of the following answer is **not** a general characteristic of ANN ?

(A) Learning

(B) Robustness

(C) Parallel processing

(D) Fast processor speed

11. What is the total length of the suffixes of a string X of length 'N' ?

(A) N^2

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

(C) N

(D) $N(N-1)$

12. Which of the following is **not** a well formed formula ?

(A) $\forall x[p(x) \rightarrow f(x) \wedge x]$

(B) $\forall x_1 \forall x_2 \forall x_3 [(x_1 = x_2 \wedge x_2 = x_3) \Rightarrow x_1 = x_3]$

(C) $\sim(p \rightarrow q) \rightarrow q$

(D) $[T \vee P(a, b)] \rightarrow \exists z\, Q(z)$

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

13. The boolean function $F_1 = xyz'$

(i) The function F_1 is equal to 0 if $x=1$, $y=1$ and $z'=1$; otherwise $F_1=0$

(ii) The function F_1 is equal to 1 if $x=1$, $y=1$ and $z'=0$; otherwise $F_1=0$

(iii) The function F_1 is equal to 1 if $x=1$, $y=1$ and $z'=1$; otherwise $F_1=1$

(iv) The function F_1 is equal to 1 if $x=0$, $y=1$ and $z'=1$; otherwise $F_1=0$

(A) Both (i) and (ii)

(B) Only (ii)

(C) Both (iii) and (iv)

(D) (i), (ii) and (iii)

14. In multi-level index :

(A) The data file is ordered by the attribute that is also the search key in the index file.

(B) The data file is ordered by an attribute that is different from the search key in the index file.

(C) An index structure consisting of two or more tiers of records when an upper tier's records point to the associated index records of the tier below.

(D) None of these

15. An outlier is :

(A) An input pattern which is not included in the test set.

(B) An input pattern which produces a classification error.

(C) An input pattern which is very different from the prototype vector of the patterns in the same class.

(D) An input pattern which is very similar to the prototype vector of the patterns in the same class.

16. Consider two raster systems with the resolutions of 640×480 and 1280×1024. How many pixels could be accessed per second in each of these systems by a display controller that refreshes the screen at a rate of 60 frames per second ?

(A) 1.8432×107 pixels/second

(B) 1.9432×109 pixels/second

(C) 1.78932×105 pixels/second

(D) 1.6532×107 pixels/second

17. Requirements for Multimedia Data Modeling and Retrieval is _____.

(A) Image indexing

(B) Phrase indexing

(C) Both (A) and (B)

(D) None of the above

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

18. During operation of a database query which files are used :

(A) DML and query language

(B) Query language and utilities

(C) Query language and data dictionary

(D) Data dictionary and transaction log

19. The logical configuration of shift register consist of a chain of flip-flops connected in a cascade, with the output of one flip-flop is connected as input to next flip-flop. This is true if :

(i) All flip-flops are not connected to another with each other.

(ii) Output of one flip-flop is complimented input to next flip-flop.

(iii) Each flip-flop is having separate clock pulse.

(iv) All flip-flops received common clock pulse that causes the shift from one stage to the next.

(A) (i), (ii) and (iv)

(B) (i), (iii) and (iv)

(C) (i) and (iii)

(D) Only (iv)

20. Clients access network-attached storage via a remote-procedure-call interface such as NFS for UNIX systems or _____ for windows machines.

(i) IFSCI

(ii) CIFS

(iii) NFSCI

(iv) SFSCI

(A) (i), (ii) and (iii)

(B) Only (ii)

(C) (ii) and (iii)

(D) (i) and (iv)

21. A binary operator * on set S is set to be associated whenever :

(i) $(x*y)*z = x*(y*z)$ for all $x, y, z \in S$

(ii) $(x*y*z) = x*y*z$ for all $x, y, z \neq S$

(iii) $x*y*z \neq (x*y*z)$ for all $x, y, z = S$

(iv) $x + (y*z) = (x+y)*z$ for all $x, y, z \neq S$

(A) Only (i)

(B) Only (iii)

(C) Both (ii) and (iii)

(D) Only (iv)

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

22. Which of the following is **correct** ?

```
#include<stdio.h>

int main()

{

char s1[20]={"abc"}, s2[20]={"aac"};

int i, j;

i=strcmp(s1, s2);

j=strcmp(s2, s1);

printf("i=%d and j=%d", i, j);

}
```

(A) i=1 and j=−1

(B) i=1 and j=1

(C) i=−1 and j=1

(D) i=0 and j=0

23. Equivalence partitioning comes under which of the following ?

(A) White box testing

(B) Black box testing

(C) Grey box testing

(D) None of the above

24. The lock-key scheme is a compromise between _____ lists and capability lists.

(i) data

(ii) program

(iii) output

(iv) access

(A) (i) and (ii)

(B) (ii) and (iii)

(C) Only (iii)

(D) Only (iv)

25. A* algorithm is a :

(A) Blind graph search

(B) Random search

(C) Heuristic search

(D) None of these

26. Suppose computers A and B have IP addresses 10.105.1.113 and 10.105.1.91 respectively. Both use the same net mask N. Which of the values of N given below should not be used, if A and B belong to the same network ?

(A) 255.255.255.0

(B) 255.255.255.128

(C) 255.255.255.192

(D) 255.255.255.224

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

27. The minimum time-complexity for training a SVM is $O(n^2)$. Then what sizes of datasets are not best suited for SVM's ?

(A) Small datasets

(B) Medium datasets

(C) Large datasets

(D) Size does not matter

28. Which of the following is **true** statement ?

(A) It is undecidable that whether a Turing Machine M halts on all inputs.

(B) PCP is undecidable for words over one symbol alphabet.

(C) Both (A) and (B) are true.

(D) Both (A) and (B) are false.

29. In Map-Reduce computing algorithm, which of the following is true ?

(A) Each Map-tasks are given to one or more chunks from a distributed file system.

(B) The key value pairs are collected by a master controller and sorted by key.

(C) Reduce tasks combine all values associated with a key on some manner.

(D) All of the above are true.

30. If two systems are connected to the same link, there is usually no need for :

(i) Data link layer

(ii) Network layer

(iii) Physical layer

(iv) Application layer

(A) Only (i)

(B) Only (ii)

(C) (i) and (ii)

(D) (ii) and (iii)

31. A signal is carrying data in which one data element recorded as one signal element ($r = 1$). If the bit rate is 100 kbps, what is the average value of baud rate if c is in between 0 and 1 ?

(i) 49 K baud

(ii) 51 K baud

(iii) 500 K baud

(iv) 50 K baud

(A) (i) and (iv)

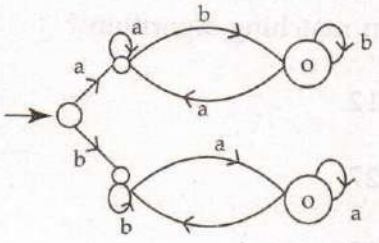
(B) (ii) and (iv)

(C) (i) and (iii)

(D) Only (iv)

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

32. Let the finite automaton M is denoted by the Transition diagram,



then M accepts the _____.

(A) All the strings with a double 'a'

(B) All the strings with different first and different last letter

(C) All the strings which contains three consecutive a's

(D) None of the above

33. Let $L = \{w \mid w \in \{a, b\}^*$ and number of a's and b's are divisible by 3 and 5 respectively$\}$, then the minimum state DFA accepting L has :

(A) 11 states

(B) 15 states

(C) 17 states

(D) 9 states

34. Which of the following is highest degree of integration in cloud computing ?

(A) SaaS

(B) PaaS

(C) CaaS

(D) AaaS

35. If the check bits do not compare with the stored parity, they generate a unique pattern, called syndrome, that can be used to :

(i) Correct the bit in error

(ii) Identify the word in error

(iii) Identify the bit in error

(iv) Not identify the bit in error

(A) (iii) and (iv)

(B) (ii) and (iv)

(C) (ii) and (iii)

(D) Only (iii)

36. Which of the following next header code in IPv6 is used to define encrypted security pay-load datagram ?

(A) 50

(B) 43

(C) 51

(D) 59

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

37. Digital signature uses which algorithm ?

(A) DES

(B) RSA

(C) AES

(D) Deffie Hellman Algorithm

38. Which of the following statement is **correct** ?

(A) Cavalier projection makes 45° angle with the projection plane

(B) Cavalier projection makes 63.4° angle with the projection plane

(C) Cabinet projection makes 63.4° angle with the projection plane

(D) Cabinet projection makes 65° angle with the projection plane

39. What is the time complexity of the given pseudo code ?

```
for i=1 to n;
    for j=i to n;
        for k=1 to j;
    x:=x+1;
```

(A) $O(n^2)$

(B) $O(n)$

(C) $O(i*j*k)$

(D) $O(n^3)$

40. How many comparisons are required to search for a pattern *abacab* in a string *abacaabadcabacabaabb* using Boyer-Moore Pattern matching algorithm ?

(A) 12

(B) 27

(C) 13

(D) 21

41. _____ are those applications which do not require datasets from other sites in distributed database.

(A) Global application

(B) Local application

(C) Common application

(D) None of these

42. What is the total number of spanning trees with 10 vertices in a complete graph ?

(A) 10^8

(B) 10^9

(C) 10^7

(D) 10^6

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

43. How many number of 2×1 MUX required to realize 2-input OR gate and 2-input XOR gate ?

(A) 2 and 1

(B) 1 and 1

(C) 1 and 2

(D) 1 and 3

44. What is complexity of the given recurrence relation ?

$T(n) = 2T(n/4) + \sqrt{n} + 43$

(A) $O(n \log n)$

(B) $O(n \log \sqrt{n})$

(C) $O(\sqrt{n})$

(D) $O(\sqrt{n} \log n)$

45. What is the output of the given C++ code ?

```
using namespace std;
class Test {
public:
Test(){cout<<"Inside Constructor" <<
endl;}
~Test(){cout<<"Destructor"<<endl;}
};
int main( ) {
try {
Test t1;
throw 10.00;
}
catch(int i) {
cout<<"UGCNET Exam"<<i<<endl;
}
catch(...) {
cout<<"CSET Exam" <<endl;
}
};
```

(A) Inside Constructor
Destructor
UGCNET Exam 50

(B) Inside Constructor
Destructor

(C) Inside Constructor
Destructor
CSET Exam

(D) UGCNET Exam 50

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

46. The period of a signal is 100 ms. What is its frequency in Kilohertz ?

(i) 10^{-1} kHz

(ii) 10^{2} kHz

(iii) 10^{-2} kHz

(iv) 10^{-3} kHz

(A) Only (ii) and (iii)

(B) Only (iv)

(C) Only (iii)

(D) Only (iii) and (iv)

47. Fuzzy logic based controller design is based on the following sequence :

(A) Fuzzy sets → Defuzzification → Rule evaluation

(B) Fuzzification → Rule evaluation → Defuzzification

(C) Rule evaluation → Fuzzification → Defuzzification

(D) Defuzzification → Rule evaluation → Fuzzification

48. The software requirements are implemented by its category in :

(A) Evolutionary development model

(B) Waterfall model

(C) Prototyping

(D) Iterative enhancement model

49. Which of the following represents coupling and cohesion ?

(A) Cause-effect graph

(B) Dependence graph

(C) Structure chart

(D) SRS

50. Let G be an undirected graph. Let $P(x, y)$ mean that there is a path from vertex x to vertex y. Express the sentence S1 and S2 in terms of P, quantifiers, logical connectives and equality, using variables that range over the vertices of G.

S1 : G has a vertex of degree zero

S2 : G has at least three connected components

(A) $\exists x \forall y\ P(x, y) \rightarrow x = y$ and $\exists x, y, z, \neg P(x, y) \wedge \neg P(x, z) \wedge \neg P(y, z)$.

(B) $\exists x \forall y\ P(x, y) \rightarrow x > y$ and $\exists x, y, z, \neg P(x, y) \wedge \neg P(x, z) \wedge \neg P(y, z)$.

(C) $\exists x \forall y\ P(x, y) \rightarrow x < y$ and $\exists x, y, z, \neg P(x, y) \wedge \neg P(x, z) \wedge \neg P(y, z)$.

(D) $\exists x \forall y\ P(x, y) \rightarrow x = y$ and $\exists x, y, z, \neg P(x, y) \wedge \neg P(x, z) \wedge P(y, z)$.

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

51. What is the output of the given C++ code ?

```
#include<iostream>
using namespace std;
int main()
{
int x1=49, x2=48, x3=150, x4=50;
int*arr[]={&x1, &x2, &x3, &x4};
cout<<*arr[*arr[3]-*arr[1]];
}
```

(A) Syntax error

(B) Garbage value

(C) Segmentation fault

(D) 150

52. Virtual machine is especially a challenge on dual-mode systems, where the underlying machine has only _____ mode and kernel mode.

(i) user

(ii) I/O

(iii) device

(iv) process

(A) only (i)

(B) (i) and (ii)

(C) (ii) and (iii)

(D) (iii) and (iv)

53. The basic algorithm of second-chance replacement is a FIFO replacement algorithm. When a page has been selected, however, we inspect its _____ bit.

(i) reference

(ii) first

(iii) middle

(iv) last

(A) Only (i)

(B) Only (ii)

(C) (ii) and (iii)

(D) Only (iii) and (iv)

54. Which of the following is the best description of mutation of GA ?

(A) Randomly change a small part of some string

(B) Randomly modify the strings using ranking

(C) Randomly pick strings to make the next generation

(D) Combine the genetic information from two strings

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

55. In a distributed operating system, users access _____ resources in the same way they access local resources.

(i) local

(ii) remote

(iii) own

(iv) no

(A) (i), (ii) and (iii)

(B) Only (ii)

(C) (iii) and (iv)

(D) (ii) and (iv)

56. Research and development in aspect oriented software development has primarily focus on :

(A) Software re-engineering

(B) Artificial programming

(C) Aspect oriented programming

(D) All of the above

57. The truth value of traditional set theory is _____ and that of Fuzzy set theory is _____.

(A) Either 0 or 1, between 0 and 1

(B) Between 0 and 1, either 0 or 1

(C) Between 0 and 1, between 0 and 1

(D) Either 0 or 1, either 0 or 1

58. How to define target in new page in HTML ?

(A) Click Here

(B) Click Here

(C) <a href="http://.....com/"target ="@blank">Click Here<t/a>

(D) Click Here

59. For a graph G with 6 vertices and 14 edges and minimum spanning tree cost is 32. What is the minimum cost if the cost of the edges are doubled in G ?

(A) 43

(B) 46

(C) 42

(D) 60

60. In Big-Data Analytics, Data Wrangler is :

(A) A Data cleaning and transformation tool

(B) No SQL query optimization tool

(C) Map-reduce algorithm tool

(D) None of the above

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

61. Software engineering process model does **not** include :

(A) Forward engineering

(B) Inventory analysis

(C) Reverse engineering

(D) Prototyping

62. Which of the following is best example for parallel sorting algorithm ?

(A) Bubble sort

(B) Quick sort

(C) Merge sort

(D) Bitonic sort

63. The neural network formed in three layers is best described by :

(A) input layer, processing layer, output layer

(B) input layer, control layer, output layer

(C) input layer, hidden layer, output layer

(D) None of the above

64. The process of eliminating existential quantifiers is known as :

(A) Resolution

(B) Unification

(C) Skolemisation

(D) None of these

65. _____ is a virtual file system that maintains "contract" information to manage which processes start when the system boots and must continue to run during operations.

(i) tmpfs

(ii) objfs

(iii) ctfs

(iv) lofs

(A) (i), (ii) and (iv)

(B) (ii) and (iv)

(C) Only (iii)

(D) (i) and (iv)

66. An analog signal has a bit rate of 8000 bps and a baud rate of 1000 baud. How many data elements are carried by each signal elements ? How many signal elements do we need ?

(i) 8 bit/baud and 256

(ii) 7 bit/baud and 255

(iii) 8 bit and 256

(iv) 8 baud and 256

(A) Only (i)

(B) (ii) and (iii)

(C) (i) and (ii)

(D) (iii) and (iv)

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

67. In how many different ways can the letters of the word 'READING' be arranged in such a way that the vowels always come together ?

(A) 360

(B) 480

(C) 720

(D) 5040

68. Consider a list of unsorted elements : 10 47 12 54 19 23

Which of the following is the sequence of elements in the list After Pass 3 when Bubble Sort algorithm applied ?

(A) 54 47 12 10 19 23

(B) 54 47 12 19 23 10

(C) 54 47 23 10 19 12

(D) 54 47 23 12 19 10

69. It seems that moderately tiny caches will have a big impact on :

(i) Performance

(ii) Output data

(iii) Input data

(iv) Resultant data

(A) (i)

(B) (ii) and (iii)

(C) (iii) and (iv)

(D) (ii) and (iv)

70. Suppose R is a relational schema and F is a set of functional dependencies. Further suppose R1 and R2 form a decomposition of R. Then the decomposition is lossless join decomposition of R if :

(A) $R1 \cap R2 \rightarrow R1$

(B) $R1 \cap R2 \rightarrow R2$

(C) Both $R1 \cap R2 \rightarrow R1$ and $R1 \cap R2 \rightarrow R2$

(D) Either $R1 \cap R2 \rightarrow R1 - R2$ or $R1 \cap R2 \rightarrow R2 - R1$

71. Which of the following statement is **false** ?

(A) Three address code is defined by the instructions of the form A = Bopd, where A, B, C are addresses and op is a binary or logical operator.

(B) Three address code is defined by the conditional jump such as
if A relop B goto L.
Where relop = {<, >, ≥, etc}.

(C) Three address code is defined by indexed assignments of the form, A = B[I] and A[I] = B.

(D) None of the above.

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

72. In general the hamming code is consist of k check bits and n data bits for a total of :

(i) $n+k$ bits

(ii) $n*k$ bits

(iii) $n^2-(n*k)$ bits

(iv) $\Sigma n-k$ bits

(A) (ii)

(B) (i)

(C) (iii)

(D) (iv)

73. Which of the following options are **correct** ?

(a) A complete graph with n vertices contains $n(n-1)/2$ edges.

(b) A finite graph is bipartite if and only if it contains no cycles of odd length.

(c) The sum of the degrees of the vertices of any finite graph is even.

(d) A directed graph where every vertex has the same number of incoming as outgoing paths there exists an Eulerian path for the graph.

(A) Statement (a), (b) are true and (c), (d) are false.

(B) Statement (a), (c) are true and (b), (d) are false.

(C) Statement (a), (b), (c), (d) are true.

(D) Statement (b), (c) are true and (a), (d) are false.

74. In virtual memory, even such programs which have a larger size than the main memory are allowed to be :

(i) not allocate

(ii) copy

(iii) stored

(iv) executed

(A) (i) and (iv)

(B) (ii) and (i)

(C) Only (iv)

(D) (iii) and (iv)

75. We can use a protocol to prevent or avoid _____, ensuring that the system will never enter a deadlock state.

(i) System

(ii) Input

(iii) Deadlocks

(iv) Output

(A) (i) and (ii)

(B) (ii) and (iii)

(C) Only (iii)

(D) Only (i) and (iv)

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

76. As an example of SJF scheduling, consider the following set of processes, with the length of CPU burst time, given in milliseconds :

Process	Burst Time
P_1	6
P_2	8
P_3	7
P_4	3

What is the average waiting time for all processes under non primitive scheduling ?

(i) 7 milliseconds

(ii) 6 milliseconds

(iii) 8 milliseconds

(iv) 5 milliseconds

(A) Only (i)

(B) Less than (i) but greater than (ii)

(C) Greater than (iii)

(D) Less than (iv)

77. For function $F(A, B, C, D) = \Sigma(2, 3, 8, 10, 11, 12, 14, 15)$, identify the minimum number of literals and minimum number of NAND gates required to realize the simplified function F.

(A) 5

(B) 7

(C) 6

(D) 4

78. The predicate like-read(P, B) incates the person P likes to read the book B.
Bill likes all books John likes
Display the books Bill like in proper order.

like-read("John", "Comp.Sc").

like-read("Bill", "Physics").

like-read("Bill", B) :- like-read("John", B).

? -like-read("Bill", B).

(A) Comp.Sc
Physics

(B) Physics
Comp.Sc

(C) Physics

(D) Comp.Sc

79. White box testing technique is also classified as :

(A) Design based testing

(B) Structural testing

(C) Error guessing technique

(D) None of the mentioned

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

80. Determine which of the following properties satisfies if the relation has a common factor greater than 1 ?

(A) Symmetric and reflexive only

(B) Symmetric only

(C) Reflexive only

(D) Transitive only

81. Frequent-Pattern growth Algorithm is _____.

(A) Classification Algorithm

(B) To Test Candidate Itemsets

(C) Clustering Algorithm

(D) None of the above

82. The memory unit of capacity of 1K word of 16 bits each. The memory can accommodate :

(i) 1K bytes

(ii) 2K bytes

(iii) 3K bytes

(iv) 0K bytes

(A) (i) and (ii)

(B) Only (ii)

(C) (ii) and (iii)

(D) (ii) and (iv)

83. The r's complement of an n-digit number N in base r is defined as :

(i) $r^n - N$ for $N \neq 0$ and 0 for $N = 0$

(ii) $N - r^n - N$ for $N \neq 0$ and 0 for $N = 0$

(iii) $N - r^n$ for $N \neq 0$ and 0 for $N = 0$

(iv) $r^n - N$ for $N = 0$ and 0 for $N \neq 0$

(A) Only (i)

(B) Both (i) and (ii)

(C) Only (ii)

(D) Both (iii) and (iv)

84. Which of the following is a project scheduling method that can be applied to software development ?

(A) PERT

(B) CPM

(C) CMM

(D) Both PERT and CMM

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

85. As an example considered following four processes with the length of the CPU burst time given in milliseconds :

Process	Arrival Time	Burst Time
P_1	0	8
P_2	1	4
P_3	2	9
P_4	3	5

What is the average waiting time for all processes under primitive scheduling ?

(i) 6 milliseconds

(ii) 6.5 milliseconds

(iii) 7 milliseconds

(iv) 7.5 milliseconds

(A) Only (i)

(B) Only (ii)

(C) Greater than (iii)

(D) Less than (i)

86. Which of the following parsing methods use the functions FIRST and FOLLOW ?

(A) Operator precedence parsing

(B) Recursive descent parsing

(C) LALR parsing

(D) None of the above

87. Which of the following operators can use friend functions for overloading ?

(A) = =

(B) [ ]

(C) ( )

(D) ->

88. Which of the following is **correct** for the given code snippet ?

```
int i;
for(i=0;i<10000000;i++);
```

(A) Syntax error

(B) Time delay loop

(C) Conditional selective loop

(D) Selective loop

89. What is the worst case running time for Find operation on a Tree with 'N' nodes on unbalanced Binary Search tree and AVL tree ?

(A) O(N) and O(N log N)

(B) O(N) and O(N)

(C) O(N log N) and O(N)

(D) O(N) and O(log N)

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

90. In addition to the accuracy of delivery, network reliability is measured by :

(i) The frequency of failure

(ii) The time it takes to recover from failure

(iii) The network robustness in the catastrophe

(iv) The content of message

(A) (i), (ii) and (iii)

(B) Only (iv)

(C) Only (ii)

(D) Only (i) and (iii)

91. An attribute for a non terminal A at a parse tree node N is defined by a semantic rule associated with the production at N. Then the attribute is _____.

(A) Inherited attribute

(B) Synthesized attribute

(C) Derived attribute

(D) None of the above

92. The relocation - register scheme provides an effective way to allow the operating system's size to change _____.

(i) static

(ii) at the end of allocation method

(iii) never

(iv) dynamically

(A) (ii) and (i)

(B) (ii) and (iii)

(C) Only (i)

(D) Only (iv)

93. Let L be the set of all strings over an alphabet {a, b} with exactly twice as many a's as b's then :

(A) L is accepted by a turing machine.

(B) L is accepted by a deterministic finite automaton.

(C) L is accepted by a linear bounded automaton.

(D) L is accepted by a push-down automaton.

94. Let S be a NP-Complete problem and Q and R be two other problems not known to be in NP. Q is polynomial time reducible to S and S is polynomial time reducible to R. Which one of the following statements is **true** ?

(A) R is NP Complete

(B) R is NP Hard

(C) Q is NP Complete

(D) Q is NP Hard

95. What is the minimum possible number of nodes required to draw an AVL tree of height 4 ?

(A) 11

(B) 12

(C) 13

(D) 15

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

96. A slotted ALOHA network transmits 200 bit frames using shared channel with a 200 kbps bandwidth. If the system produces 250 frames per second, then the throughput of the system is :

(A) 0.368

(B) 0.195

(C) 0.184

(D) 0.152

97. How many phases are there in SCRUM ?

(A) Two

(B) Three

(C) Four

(D) Zero

98. Which of the following statement is **true** ?

(A) Register Allocation and Assignment is one of the important characteristic of peephole optimization.

(B) Data Flow Analysis that derives the information about the flow of data in execution path is one of the properties of peephole optimization.

(C) Flow of Control optimization for eliminating unnecessary jumps is one of the important characteristic of peephole optimization.

(D) All three of the above are correct.

99. If it is possible to check every requirement by a cost-effective process, then the SRS is :

(A) Verifiable

(B) Traceable

(C) Modifiable

(D) Complete

100. What is the minimum sum-of-products expression of the function

$F(w, x, y, z) = \Pi M(1, 3, 4, 6, 7, 9, 11, 12, 15)$?

(A) $wx' + yz$

(B) $(w + x)(y + z)$

(C) $x'z' + xy'z + wyz'$

(D) $x'z + xyz$

- o O o -

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

SEAL

SET - A

उत्तर अंकित करने का समय : 2 घंटे

Time for marking answers : 2 Hours

अधिकतम अंक : 200

Maximum Marks : 200

नोट :

1. इस प्रश्न-पुस्तिका में 100 प्रश्न है - प्रत्येक प्रश्न 2 अंक का है। सभी प्रश्न हल करना अनिवार्य है।
2. प्रश्नों के उत्तर, दी गई **OMR** उत्तर-शीट (आंसर-शीट) पर अंकित कीजिए।
3. ऋणात्मक मूल्यांकन नहीं किया जावेगा।
4. किसी भी तरह के कैलकुलेटर या लॉग टेबल एवं मोबाइल फोन का प्रयोग वर्जित है।
5. **OMR** उत्तर-शीट (आंसर-शीट) का प्रयोग करते समय ऐसी कोई असावधानी न करें/बरतें जिससे यह फट जाये या उसमें मोड़ या सिलवट आदि पड़ जाये जिसके फलस्वरूप वह खराब हो जाये।

SEAL

Note :

1. There are **100** objective type questions in this booklet. **All** questions are **compulsory** and carry **2** marks each.
2. Indicate your answers on the **OMR** Answer-Sheet provided.
3. No negative marking will be done.
4. Use of any type of calculator or log table and mobile phone is prohibited.
5. While using **OMR** Answer-sheet care should be taken so that the Answer-sheet does not get torn or spoiled due to folds and wrinkles.

SEAL