PAPER-III
COMPUTER SCIENCE AND APPLICATIONS

Signature and Name of Invigilator

1. (Signature) _____

   (Name) _____

2. (Signature) _____

   (Name) _____

OMR Sheet No. : ....

(To be filled by the Candidate)

Roll No. | | | | | | | | |

(In figures as per admission card)

Roll No._____

(In words)

| D | 8 | 7 | 1 | 2 |

Time : **2 ¹/₂ hours**]

[Maximum Marks : **150**

Number of Pages in this Booklet : **12**

Number of Questions in this Booklet : **75**

Instructions for the Candidates	
1. Write your roll number in the space provided on the top of this page.	1. पहले पृष्ठ के ऊपर नियत स्थान पर अपना रोल नम्बर लिखिए ।
2. This paper consists of seventy five multiple-choice type of questions.	2. इस प्रश्न-पत्र में पचहत्तर बहुविकल्पीय प्रश्न हैं ।
3. At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below :	3. परीक्षा प्रारम्भ होने पर, प्रश्न-पुस्तिका आपको दे दी जायेगी । पहले पाँच मिनट आपको प्रश्न-पुस्तिका खोलने तथा उसकी निम्नलिखित जाँच के लिए दिये जायेंगे, जिसकी जाँच आपको अवश्य करनी है :
(i) To have access to the Question Booklet, tear off the paper seal on the edge of this cover page. Do not accept a booklet without sticker-seal and do not accept an open booklet.	(i) प्रश्न-पुस्तिका खोलने के लिए उसके कवर पेज पर लगी कागज की सील को फाड़ लें । खुली हुई या बिना स्टीकर-सील की पुस्तिका स्वीकार न करें ।
(ii) **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 by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.**	(ii) **कवर पृष्ठ पर छपे निर्देशानुसार प्रश्न-पुस्तिका के पृष्ठ तथा प्रश्नों की संख्या को अच्छी तरह चैक कर लें कि ये पूरे हैं । दोषपूर्ण पुस्तिका जिनमें पृष्ठ/प्रश्न कम हों या दुबारा आ गये हों या सीरियल में न हों अर्थात् किसी भी प्रकार की त्रुटिपूर्ण पुस्तिका स्वीकार न करें तथा उसी समय उसे लौटाकर उसके स्थान पर दूसरी सही प्रश्न-पुस्तिका ले लें । इसके लिए आपको पाँच मिनट दिये जायेंगे । उसके बाद न तो आपकी प्रश्न-पुस्तिका वापस ली जायेगी और न ही आपको अतिरिक्त समय दिया जायेगा ।**
(iii) After this verification is over, the OMR Sheet Number should be entered on this Test Booklet.	(iii) इस जाँच के बाद OMR पत्रक की क्रम संख्या इस प्रश्न-पुस्तिका पर अंकित कर दें ।
4. Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item. **Example :** (A) (B) ● (D) where (C) is the correct response.	4. प्रत्येक प्रश्न के लिए चार उत्तर विकल्प (A), (B), (C) तथा (D) दिये गये हैं । आपको सही उत्तर के वृत्त को पेन से भरकर काला करना है जैसा कि नीचे दिखाया गया है । **उदाहरण** : (A) (B) ● (D) जबकि (C) सही उत्तर है ।
5. Your responses to the items are to be indicated in the **OMR Sheet given inside the Booklet only.** If you mark at any place other than in the circle in the OMR Sheet, it will not be evaluated.	5. प्रश्नों के उत्तर **केवल प्रश्न पुस्तिका के अन्दर दिये गये OMR पत्रक पर ही** अंकित करने हैं । यदि आप OMR पत्रक पर दिये गये वृत्त के अलावा किसी अन्य स्थान पर उत्तर चिह्नांकित करते हैं, तो उसका मूल्यांकन नहीं होगा ।
6. Read instructions given inside carefully.	6. अन्दर दिये गये निर्देशों को ध्यानपूर्वक पढ़ें ।
7. Rough Work is to be done in the end of this booklet.	7. कच्चा काम (Rough Work) इस पुस्तिका के अन्तिम पृष्ठ पर करें ।
8. If you write your Name, Roll Number, Phone Number or put any mark on any part of the OMR Sheet, except for the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, you will render yourself liable to disqualification.	8. यदि आप OMR पत्रक पर नियत स्थान के अलावा अपना नाम, रोल नम्बर, फोन नम्बर या कोई भी ऐसा चिह्न जिससे आपकी पहचान हो सके, अंकित करते हैं अथवा अभद्र भाषा का प्रयोग करते हैं, या कोई अन्य अनुचित साधन का प्रयोग करते हैं, तो परीक्षा के लिये अयोग्य घोषित किये जा सकते हैं ।
9. You have to return the test question booklet and Original OMR Sheet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are, however, allowed to carry duplicate copy of OMR Sheet on conclusion of examination.	9. आपको परीक्षा समाप्त होने पर प्रश्न-पुस्तिका एवं मूल OMR पत्रक निरीक्षक महोदय को लौटाना आवश्यक है और परीक्षा समाप्ति के बाद उसे अपने साथ परीक्षा भवन से बाहर न लेकर जायें । हालांकि आप परीक्षा समाप्ति पर OMR पत्रक की डुप्लीकेट प्रति अपने साथ ले जा सकते हैं ।
10. Use only Blue/Black Ball point pen.	10. केवल नीले/काले बाल प्वाईंट पेन का ही इस्तेमाल करें ।
11. Use of any calculator or log table etc., is prohibited.	11. किसी भी प्रकार का संगणक (कैलकुलेटर) या लाग टेबल आदि का प्रयोग वर्जित है ।
12. There is no negative marks for incorrect answers.	12. गलत उत्तरों के लिए कोई अंक काटे नहीं जाएँगे ।

COMPUTER SCIENCE AND APPLICATIONS
PAPER – III

Note : This paper contains **seventy five (75)** objective type questions of **two (2)** marks each. **All** questions are compulsory.

1. Eco system is a Frame work for
(A) Building a Computer System
(B) Building Internet Market
(C) Building Offline Market
(D) Building Market

2. The efficiency (E) and speed up (sp) for Multiprocessor with p processors satisfies :
(A) $E \leq p$ and $s_p \leq p$
(B) $E \leq 1$ and $s_p \leq p$
(C) $E \leq p$ and $s_p \leq 1$
(D) $E \leq 1$ and $s_p \leq 1$

3. Match the following :

List – I	List – II
a. Critical region	1. Hoares Monitor
b. Wait/signal	2. Mutual exclusion
c. Working set	3. Principal of locality
d. Dead lock	4. Circular wait

Codes :

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

4. The technique of temporarily delaying outgoing acknowledgements so that they can be hooked onto the next outgoing data frame is known as
(A) Bit stuffing
(B) Piggy backing
(C) Pipelining
(D) Broadcasting

5. _____ is process of extracting previously non known valid and actionable information from large data to make crucial business and strategic decisions.
(A) Data Management
(B) Data base
(C) Data Mining
(D) Meta Data

6. The aspect ratio of an image is defined as
(A) The ratio of width to its height measured in unit length.
(B) The ratio of height to width measured in number of pixels.
(C) The ratio of depth to width measured in unit length.
(D) The ratio of width to depth measured in number of pixels.

7. Which of the following features will characterize an OS as multi-programmed OS ?
(a) More than one program may be loaded into main memory at the same time.
(b) If a program waits for certain event another program is immediately scheduled.
(c) If the execution of a program terminates, another program is immediately scheduled.
(A) (a) only
(B) (a) and (b) only
(C) (a) and (c) only
(D) (a), (b) and (c) only

8. Using RSA algorithm, what is the value of cipher text C, if the plain text M = 5 and p = 3, q = 11 & d = 7 ?
(A) 33
(B) 5
(C) 25
(D) 26

9. You are given an OR problem and a XOR problem to solve. Then, which one of the following statements is true ?
(A) Both OR and XOR problems can be solved using single layer perception.
(B) OR problem can be solved using single layer perception and XOR problem can be solved using self organizing maps.
(C) OR problem can be solved using radial basis function and XOR problem can be solved using single layer perception.
(D) OR problem can be solved using single layer perception and XOR problem can be solved using radial basis function.

10. Match the following :

List – I	List – II
a. Application layer	1. TCP
b. Transport layer	2. HDLC
c. Network layer	3. HTTP
d. Data link layer	4. BGP

Codes :

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

11. The time complexities of some standard graph algorithms are given. Match each algorithm with its time complexity ? (n and m are no. of nodes and edges respectively)

a. Bellman Ford algorithm	1. $O(m \log n)$
b. Kruskals algorithm	2. $O(n^3)$
c. Floyd Warshall algorithm	3. $O(mn)$
d. Topological sorting	4. $O(n + m)$

Codes :

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

12. Let $V_1 = 2I - J + K$ and $V_2 = I + J - K$, then the angle between V_1 & V_2 and a vector perpendicular to both V_1 & V_2 shall be :
(A) $90°$ and $(-2I + J - 3K)$
(B) $60°$ and $(2I + J + 3K)$
(C) $90°$ and $(2I + J - 3K)$
(D) $90°$ and $(-2I - J + 3K)$

13. Consider a fuzzy set A defined on the interval X = [0, 10] of integers by the membership Junction

$$\mu_A(x) = \frac{x}{x + 2}$$

Then the α cut corresponding to $\alpha = 0.5$ will be
(A) {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
(B) {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
(C) {2, 3, 4, 5, 6, 7, 8, 9, 10}
(D) { }

14. Let $T(n)$ be the function defined by $T(n) = 1$ and $T(n) = 2T(n/2) + \sqrt{n}$, which of the following is TRUE ?

(A) $T(n) = O(\sqrt{n})$

(B) $T(n) = O(\log_2 n)$

(C) $T(n) = O(n)$

(D) $T(n) = O(n^2)$

15. In classful addressing, an IP address 123.23.156.4 belongs to _____ class format.

(A) A

(B) B

(C) C

(D) D

16. The Mandelbrot set used for the construction of beautiful images is based on the following transformation :

$$x_{n+1} = x_n^2 + z$$

Here,

(A) Both x & z are real numbers.

(B) Both x & z are complex numbers.

(C) x is real & z is complex.

(D) x is complex & z is real.

17. Which of the following permutations can be obtained in the output using a stack of size 3 elements assuming that input, sequence is 1, 2, 3, 4, 5 ?

(A) 3, 2, 1, 5, 4

(B) 5, 4, 3, 2, 1

(C) 3, 4, 5, 2, 1

(D) 3, 4, 5, 1, 2

18. In a Linear Programming Problem, suppose there are 3 basic variables and 2 non-basic variables, then the possible number of basic solutions are

(A) 6

(B) 8

(C) 10

(D) 12

19. Identify the following activation function :

$$\phi(V) = Z + \frac{1}{1 + \exp(-x * V + Y)},$$

Z, X, Y are parameters

(A) Step function

(B) Ramp function

(C) Sigmoid function

(D) Gaussian function

20. The no. of ways to distribute n distinguishable objects into k distinguishable boxes, so that n_i objects are placed into box i, i = 1, 2, ... k equals which of the following ?

(A) $\dfrac{n!}{n_1! + n_2! + ... + n_k!}$

(B) $\dfrac{n_1! + n_2! + ... + n_k!}{n_1!\ n_2!\ n_3!\ .....\ n_k!}$

(C) $\dfrac{n!}{n_1!\ n_2!\ n_3!\ .....\ n_k!}$

(D) $\dfrac{n_1!\ n_2!\ .....\ n_k!}{n_1! - n_2! - n_3!\ .....\ - n_k!}$

**21.** How many solutions do the following equation have

$$x_1 + x_2 + x_3 = 11$$

where $x_1 \geq 1, x_2 \geq 2, x_3 \geq 3$

(A) C(7, 11)

(B) C(11, 3)

(C) C(14, 11)

(D) C(7, 5)

22. Which provides an interface to the TCP/IP suit protocols in Windows95 and Windows NT ?

(A) FTP Active-X Control

(B) TCP/IP Active-X Control

(C) Calinsock Active-X Control

(D) HTML Active-X Control

23. What are the final values of Q_1 and Q_0 after 4 clock cycles, if initial values are 00 in the sequential circuit shown below :
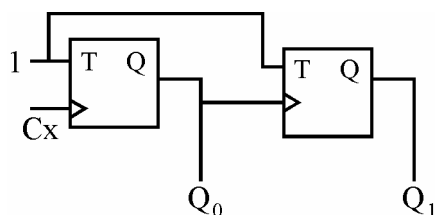
- (A) 11
- (B) 10
- (C) 01
- (D) 00

24. If dual has an unbounded solution, then its corresponding primal has

- (A) no feasible solution
- (B) unbounded solution
- (C) feasible solution
- (D) none of these

25. The number of distinct bracelets of five beads made up of red, blue, and green beads (two bracelets are indistinguishable if the rotation of one yield another) is,

- (A) 243
- (B) 81
- (C) 51
- (D) 47

26. Which are the classifications of data used in Mobile Applications ?

- (A) Private data, User data, Shared data.
- (B) Public data, User data, Virtual data.
- (C) Private data, Public data, Shared data.
- (D) Public data, Virtual data, User data.

27. In an enhancement of a CPU design, the speed of a floating point unit has been increased by 20% and the speed of a fixed point unit has been increased by 10%. What is the overall speed achieved if the ratio of the number of floating point operations to the number of fixed point operations is 2 : 3 and the floating point operation used to take twice the time taken by the fixed point operation in original design ?

- (A) 1.62
- (B) 1.55
- (C) 1.85
- (D) 1.285

28. The initial basic feasible solution to the following transportation problem using Vogel's approximation method is

	D_1	D_2	D_3	D_4	Supply
S_1	1	2	1	4	30
S_2	3	3	2	1	50
S_3	4	2	5	9	20
Demand	20	40	30	10	

- (A) $x_{11} = 20$, $x_{13} = 10$, $x_{21} = 20$, $x_{23} = 20$, $x_{24} = 10$, $x_{32} = 10$, Total cost = 180

- (B) $x_{11} = 20$, $x_{12} = 20$, $x_{13} = 10$, $x_{22} = 20$, $x_{23} = 20$, $x_{24} = 10$, Total cost = 180

- (C) $x_{11} = 20$, $x_{13} = 10$, $x_{22} = 20$, $x_{23} = 20$, $x_{24} = 10$, $x_{32} = 10$, Total cost = 180

- (D) None of the above

29. 58 lamps are to be connected to a single electric outlet by using an extension board each of which has four outlets. The number of extension boards needed to connect all the light is

(A) 29

(B) 28

(C) 20

(D) 19

30. Match the following with respect to the Mobile Computing Architecture.

a. Downlink control   1. 100 Mbps

b. Radio communication data rate   2. Residency latency (RL)

c. The average duration of user's stay in cell   3. Sending data from a BS to MD

d. FDDI bandwidth   4. 2-Mbps

Codes :

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

31. Which of the following flags are set when 'JMP' instruction is executed ?

(A) SF and CF

(B) AF and CF

(C) All flags

(D) No flag is set

32. A thread is a light weight process. In the above statement, weight refers to

(A) time

(B) number of resources

(C) speed

(D) All the above

33. The Z-buffer algorithm is used for Hidden surface removal of objects. The maximum number of objects that can be handled by this algorithm shall

(A) Depend on the application

(B) be arbitrary no. of objects

(C) Depend on the memory availability

(D) Depend on the processor

34. The power set of AUB, where A = {2, 3, 5, 7} and B = {2, 5, 8, 9} is

(A) 256

(B) 64

(C) 16

(D) 4

35. In Win32, which function is used to create Windows Applications ?

(A) Win APP

(B) Win API

(C) Win Main

(D) Win Void

36. Suppose a processor does not have any stack pointer registers, which of the following statements is true ?

(A) It cannot have subroutine call instruction.

(B) It cannot have nested subroutine calls.

(C) Interrupts are not possible.

(D) All subroutine calls and interrupts are possible.

37. Everything below the system call interface and above the physical hardware is known as ____ .

(A) Kernel

(B) Bus

(C) Shell

(D) Stub

38. Which is not the correct statement ?

(A) The class of regular sets is closed under homomorphisms.

(B) The class of regular sets is not closed under inverse homomorphisms.

(C) The class of regular sets is closed under quotient.

(D) The class of regular sets is closed under substitution.

39. When a programming Language has the capacity to produce new datatype, it is called as,

(A) Overloaded Language

(B) Extensible Language

(C) Encapsulated Language

(D) Abstraction Language

40. Which of the following operating system is better for implementing client-server network ?

(A) Windows 95

(B) Windows 98

(C) Windows 2000

(D) All of these

41. Consider a system having m resources of the same type. These resources are shared by 3 processes A, B and C which have peak demands of 3, 4 and 6 respectively. For what value of m deadlock will not occur ?

(A) 7

(B) 9

(C) 10

(D) 13

42. The grammar 'G1'

S → OSO| ISI | 0|1|∈ and the grammar 'G2' is

S → as |asb| X, X → Xa | a.

Which is the correct statement ?

(A) G1 is ambiguous, G2 is unambiguous

(B) G1 is unambiguous, G2 is ambiguous

(C) Both G1 and G2 are ambiguous

(D) Both G1 and G2 are unambiguous

43. Consider n processes sharing the CPU in round robin fashion. Assuming that each process switch takes s seconds. What must be the quantum size q such that the overhead resulting from process switching is minimized but, at the same time each process is guaranteed to get its turn at the CPU at least every t seconds ?

(A) $q \le \dfrac{t - ns}{n - 1}$

(B) $q \ge \dfrac{t - ns}{n - 1}$

(C) $q \le \dfrac{t - ns}{n + 1}$

(D) $q \ge \dfrac{t - ns}{n + 1}$

44. The Default Parameter Passing Mechanism is called as

(A) Call by Value

(B) Call by Reference

(C) Call by Address

(D) Call by Name

45. Which of the following regular expression identities are true ?

(A) $(r + s)^* = r^* s^*$

(B) $(r + s)^* = r^* + s^*$

(C) $(r + s)^* = (r^* s^*)^*$

(D) $r^* s^* = r^* + s^*$

46. Two graphs A and B are shown below : Which one of the following statement is true ?
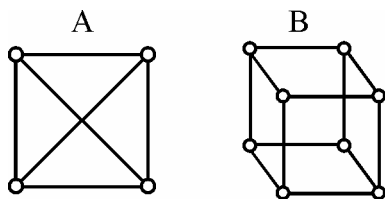
(A) Both A and B are planar.
(B) Neither A nor B is planar.
(C) A is planar and B is not.
(D) B is planar and A is not.

47. The minimum number of states of the non-deterministic finite automation which accepts the language
$\{a\,b\,a\,b^n | n \geq 0\} \cup \{a\,b\,a^n | n \geq 0\}$ is
(A) 3   (B) 4
(C) 5   (D) 6

48. Functions defined with class name are called as
(A) Inline function
(B) Friend function
(C) Constructor
(D) Static function

49. Let f be the fraction of a computation (in terms of time) that is parallelizable, P the number of processors in the system, and s_p the speed up achievable in comparison with sequential execution – then the s_p can be calculated using the relation :

(A) $\dfrac{1}{1 - f - f/P}$

(B) $\dfrac{P}{P - f(P + 1)}$

(C) $\dfrac{1}{1 - f + f/P}$

(D) $\dfrac{P}{P + f(P - 1)}$

50. Which of the following definitions generates the same Language as L, where $L = \{WW^R \mid W \in \{a, b\}*\}$
(A) $S \rightarrow asb|bsa| \in$
(B) $S \rightarrow asa|bsb| \in$
(C) $S \rightarrow asb|bsa|asa|bsb| \in$
(D) $S \rightarrow asb|bsa|asa|bsb$

51. Suppose there are $\log_n$ sorted lists of n $\log_n$ elements each. The time complexity of producing a sorted list of all these elements is
(use heap data structure)
(A) $O\,(n \log \log_n)$
(B) $\theta\,(n \log_n)$
(C) $\Omega\,(n \log_n)$
(D) $\Omega\,(n^{3/2})$

52. Consider the program below in a hypothetical programming language which allows global variables and a choice of static or dynamic scoping
```
int i;
program Main( )
    {
       i = 10;
       call f ( );
    }
    procedure f( )
    {
       int i = 20;
       call g ( );
    }
    procedure g( )
    {
       print i;
    }
```
Let *x* be the value printed under static scoping and y be the value printed under dynamic scoping. Then *x* and y are
(A) *x* = 10, y = 20
(B) *x* = 20, y = 10
(C) *x* = 20, y = 20
(D) *x* = 10, y = 10

53. If the parse tree of a word w generated by a Chomsky normal form grammar has no path of length greater than i, then the word w is of length

(A) no greater than 2^{i+1}

(B) no greater than 2^i

(C) no greater than 2^{i-1}

(D) no greater than i

54. The Object Modelling Technique (OMT) uses the following three kinds of model to describe a system

(A) Class Model, Object Model and Analysis Model.

(B) Object Model, Dynamic Model, and Functional Model.

(C) Class Model, Dynamic Model and Functional Model.

(D) Object Model, Analysis Model and Dynamic Model.

55. The factors that determine the quality of a software system are

(A) correctness, reliability

(B) efficiency, usability, maintain-ability

(C) testability, portability, accuracy, error tolerances, expandability, access control, audit.

(D) All of the above

56. If a relation with a Schema R is decomposed into two relations R_1 and R_2 such that $(R_1 \cup R_2) = R_1$ then which one of the following is to be satisfied for a lossless joint decomposition ($\rightarrow$ indicates functional dependency)

(A) $(R_1 \cap R_2) \rightarrow R_1$ or $R_1 \cap R_2 \rightarrow R_2$

(B) $R_1 \cap R_2 \rightarrow R_1$

(C) $R_1 \cap R_2 \rightarrow R_2$

(D) $R_1 \cap R_2 \rightarrow R_1$ and $R_1 \cap R_2 \rightarrow R_2$

57. Given the following statements :

(i) Recursive enumerable sets are closed under complementation.

(ii) Recursive sets are closed under complementation.

Which is/are the correct statements ?

(A) only (i)

(B) only (ii)

(C) both (i) and (ii)

(D) neither (i) nor (ii)

58. Skolmization is the process of

(A) bringing all the quantifiers in the beginning of a formula in FDL.

(B) removing all the universal quantifiers.

(C) removing all the existential quantifiers.

(D) all of the above.

59. Which level of Abstraction describes how data are stored in the data base ?

(A) Physical level

(B) View level

(C) Abstraction level

(D) Logical level

60. The transform which possesses the "multi-resolution" property is

(A) Fourier transform

(B) Short-time-Fourier transform

(C) Wavelet transform

(D) Karhunen-Loere transform

61. Which one is a collection of templates and rules ?

(A) XML

(B) CSS

(C) DHTML

(D) XSL

62. A program P calls two subprograms P_1 and P_2. P_1 can fail 50% times and P_2 40% times. Then P can fail

(A) 50%

(B) 60%

(C) 10%

(D) 70%

63. Third normal form is based on the concept of _____.

(A) Closure Dependency

(B) Transitive Dependency

(C) Normal Dependency

(D) Functional Dependency

64. If the Fourier transform of the function f(x, y) is F(m, n), then the Fourier transform of the function f(2x, 2y) is :

(A) $\frac{1}{4}F\left(\frac{m}{2}, \frac{n}{2}\right)$

(B) $\frac{1}{4}F(2m, 2n)$

(C) $\frac{1}{4}F(m, n)$

(D) $\frac{1}{4}F\left(\frac{m}{4}, \frac{n}{4}\right)$

65. _____ establishes information about when, why and by whom changes are made in a software.

(A) Software Configuration Management.

(B) Change Control.

(C) Version Control.

(D) An Audit Trail.

66. Match the following with respect to HTML tags and usage.

a. CITE   1. Italic representation

b. EM   2. Represents output from programmes

c. VAR   3. Represents to other source

d. SAMP   4. Argument to a programme

Codes :

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

67. An expert system shell is an expert system without

(A) domain knowledge

(B) explanation facility

(C) reasoning with knowledge

(D) all of the above

68. An example of a dictionary-based coding technique is

(A) Run-length coding

(B) Huffman coding

(C) Predictive coding

(D) LZW coding

69. Which is the method used to retrieve the current state of a check box ?

(A) get State ( )

(B) put State ( )

(C) retrieve State ( )

(D) write State ( )

70. Referential integrity is directly related to

(A) Relation key

(B) Foreign key

(C) Primary key

(D) Candidate key

71. You are given four images represented as

$$I_1 = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}, I_2 = \begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix},$$

$$I_3 = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}, I_4 = \begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}$$

The value of entropy is maximum for image

(A) I_1

(B) I_2

(C) I_3

(D) I_4

72. A cryptarithmetic problem of the type

SEND

+ MORE

MONEY

Can be solved efficiently using

(A) depth first technique

(B) breadth first technique

(C) constraint satisfaction technique

(D) bidirectional technique

73. Match the following :

a. Supervised learning	1. The decision system receives rewards for its action at the end of a sequence of steps.
b. Unsupervised learning	2. Manual labels of inputs are not used.
c. Re-inforcement learning	3. Manual labels of inputs are used.
d. Inductive learning	4. System learns by example

Codes :

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

74. A^* algorithm is guaranteed to find an optimal solution if

(A) h' is always 0.

(B) g is always 1.

(C) h' never overestimates h.

(D) h' never underestimates h.

75. Let $\theta(x, y, z)$ be the statement "x + y = z" and let there be two quantifications given as

(i) $\forall x \, \forall y \, \exists Z \, \theta(x, y, z)$

(ii) $\exists Z \, \forall x \, \forall y \, \theta(x, y, z)$

Where x, y, z are real numbers. Then which one of the following is correct ?

(A) (i) is true and (ii) is true.

(B) (i) is true and (ii) is false.

(C) (i) is false and (ii) is true.

(D) (i) is false and (ii) is false.

Space For Rough Work

UGC - NET DECEMBER 2012

ANSWER KEYS (PAPER III)

SUBJECT : (87) COMPUTER SCIENCE AND APPLICATIONS

Q.No.	SC87
Q01	B
Q02	B
Q03	A
Q04	B
Q05	C
Q06	A
Q07	D
Q08	D
Q09	D
Q10	C
Q11	A
Q12	D
Q13	C
Q14	C
Q15	A
Q16	B
Q17	C
Q18	C
Q19	C
Q20	C
Q21	D
Q22	C
Q23	D
Q24	A
Q25	C
Q26	C
Q27	A
Q28	C
Q29	D
Q30	B
Q31	D
Q32	B
Q33	B
Q34	B
Q35	C
Q36	D
Q37	A
Q38	B
Q39	B
Q40	C
Q41	D
Q42	B
Q43	B
Q44	A
Q45	C

Q46	A
Q47	C
Q48	C
Q49	C
Q50	B
Q51	A
Q52	D
Q53	C
Q54	B
Q55	D
Q56	A
Q57	B
Q58	C
Q59	A
Q60	C
Q61	D
Q62	D
Q63	B
Q64	A
Q65	D
Q66	A
Q67	A
Q68	D
Q69	A
Q70	B
Q71	C
Q72	C
Q73	D
Q74	C
Q75	B