www.prepp.in

Prepp
Your Personal Exams Guide

UGC NET PAPER 3 NOVEMBER 05, 2017 SHIFT 1 COMPUTER SCIENCE AND APPLICATIONS QUESTION PAPER

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

1. In 8085 microprocessor which of the following flag(s) is (are) affected by an arithmetic operation ?

(1) AC flag Only (2) CY flag Only (3) Z flag Only (4) AC, CY, Z flags

2. In 8085 microprocessor the address bus is of bits.

(1) 4 (2) 8 (3) 16 (4) 32

3. In the architecture of 8085 microprocessor match the following :

(a)	Processing unit	(i)	Interrupt
(b)	Instruction unit	(ii)	General purpose Register
(c)	Storage and Interface unit	(iii)	ALU
		(iv)	Timing and Control

Code :

	(a)	**(b)**	**(c)**
(1)	(iv)	(i)	(ii)
(2)	(iii)	(iv)	(ii)
(3)	(ii)	(iii)	(i)
(4)	(i)	(ii)	(iv)

4. Which of the following addressing mode is best suited to access elements of an array of contiguous memory locations ?

(1) Indexed addressing mode (2) Base Register addressing mode

(3) Relative address mode (4) Displacement mode

www.prepp.in

Prepp
Your Personal Exams Guide

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

(1) In memory - mapped I/O, the CPU can manipulate I/O data residing in interface registers that are not used to manipulate memory words.

(2) The isolated I/O method isolates memory and I/O addresses so that memory address range is not affected by interface address assignment.

(3) In asynchronous serial transfer of data the two units share a common clock.

(4) In synchronous serial transmission of data the two units have different clocks.

6. A micro-instruction format has micro-ops field which is divided into three subfields F1, F2, F3 each having seven distinct micro-operations, condition field CD for four status bits, branch field BR having four options used in conjunction with address field ADF. The address space is of 128 memory locations. The size of micro-instruction is :

(1) 17 bits (2) 20 bits (3) 24 bits (4) 32 bits

7. Consider the following four schedules due to three transactions (indicated by the subscript) using read and write on a data item X, denoted by r(X) and w(X) respectively. Which one of them is conflict serializable ?

S_1 : $r_1(X)$; $r_2(X)$; $w_1(X)$; $r_3(X)$; $w_2(X)$

S_2 : $r_2(X)$; $r_1(X)$; $w_2(X)$; $r_3(X)$; $w_1(X)$

S_3 : $r_3(X)$; $r_2(X)$; $r_1(X)$; $w_2(X)$; $w_1(X)$

S_4 : $r_2(X)$; $w_2(X)$; $r_3(X)$; $r_1(X)$; $w_1(X)$

(1) S_1 (2) S_2 (3) S_3 (4) S_4

8. Suppose a database schedule S involves transactions T_1, T_2, ..., T_n. Consider the precedence graph of S with vertices representing the transactions and edges representing the conflicts. If S is serializable, which one of the following orderings of the vertices of the precedence graph is guaranteed to yield a serial schedule ?

(1) Topological order (2) Depth - first order

(3) Breadth - first order (4) Ascending order of transaction indices

9. If every non-key attribute is functionally dependent on the primary key, then the relation is in .

(1) First normal form (2) Second normal form

(3) Third normal form (4) Fourth normal form

www.prepp.in

Prepp
Your Personal Exams Guide

10. Consider a relation R (A, B, C, D, E, F, G, H), where each attribute is atomic, and following functional dependencies exist.

$CH \rightarrow G$

$A \rightarrow BC$

$B \rightarrow CFH$

$E \rightarrow A$

$F \rightarrow FG$

The relation R is

(1) in 1NF but not in 2NF
(2) in 2NF but not in 3NF
(3) in 3NF but not in BCNF
(4) in BCNF

11. Given two relations R_1(A, B) and R_2(C, D), the result of following query

Select distinct A, B

from R_1, R_2

is guaranteed to be same as R_1 provided one of the following condition is satisfied.

(1) R_1 has no duplicates and R_2 is empty.
(2) R_1 has no duplicates and R_2 is non - empty.
(3) Both R_1 and R_2 have no duplicates.
(4) R_2 has no duplicates and R_1 is non - empty.

12. Consider a schema R(A, B, C, D) and following functional dependencies.

$A \rightarrow B$

$B \rightarrow C$

$C \rightarrow D$

$D \rightarrow B$

Then decomposition of R into R_1(A, B), R_2(B, C) and R_3(B, D) is

(1) Dependency preserving and lossless join.
(2) Lossless join but not dependency preserving.
(3) Dependency preserving but not lossless join.
(4) Not dependency preserving and not lossless join.

www.prepp.in

Prepp
Your Personal Exams Guide

13. Which of the following is **not** a component of Memory tube display ?

(1) Flooding gun (2) Collector (3) Ground (4) Liquid Crystal

14. Which of the following is **not** true in case of Oblique Projections ?

(1) Parallel projection rays are not perpendicular to the viewing plane.

(2) Parallel lines in space appear parallel on the final projected image.

(3) Used exclusively for pictorial purposes rather than formal working drawings.

(4) Projectors are always perpendicular to the plane of projection.

15. With respect to CRT, the horizontal retrace is defined as :

(1) The path an electron beam takes when returning to the left side of the CRT.

(2) The path an electron beam takes when returning to the right side of the CRT.

(3) The technique of turning the electron beam off while retracing.

(4) The technique of turning the electron beam on/off while retracing.

16. Find the equation of the circle $x^2+y^2=1$ in terms of $x'y'$ coordinates, assuming that the xy coordinate system results from a scaling of 3 units in the x' direction and 4 units in the y' direction.

(1) $3(x')^2+4(y')^2=1$ (2) $\left(\frac{x'}{3}\right)^2+\left(\frac{y'}{4}\right)^2=1$

(3) $(3x')^2+(4y')^2=1$ (4) $\frac{1}{3}(x')^2+\frac{1}{4}(y')^2=1$

17. Find the normalization transformation that maps a window whose lower left corner is at (1, 1) and upper right corner is at (3, 5) onto a viewport that is the entire normalized device screen.

(1) $\begin{pmatrix} \frac{1}{2} & 0 & \frac{-1}{2} \\ 0 & \frac{1}{4} & \frac{-1}{4} \\ 0 & 0 & 1 \end{pmatrix}$ (2) $\begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \\ 0 & \frac{-1}{4} & \frac{1}{4} \\ 1 & 1 & 1 \end{pmatrix}$ (3) $\begin{pmatrix} \frac{1}{2} & 0 & \frac{-1}{2} \\ 0 & \frac{1}{4} & \frac{1}{4} \\ 1 & 0 & 0 \end{pmatrix}$ (4) $\begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \\ 0 & \frac{1}{4} & \frac{-1}{4} \\ 1 & 0 & 0 \end{pmatrix}$

www.prepp.in

Prepp
Your Personal Exams Guide

18. The three aspects of Quantization, programmers generally concerned with are :

(1) Coding error, Sampling rate and Amplification

(2) Sampling rate, Coding error and Conditioning

(3) Sampling rate, Aperture time and Coding error

(4) Aperture time, Coding error and Strobing

19. The logic of pumping lemma is an example of

(1) iteration

(2) recursion

(3) the divide and conquer principle

(4) the pigeon - hole principle

20. Heap allocation is required for languages that :

(1) use dynamic scope rules

(2) support dynamic data structures

(3) support recursion

(4) support recursion and dynamic data structures

21. Pumping lemma for regular language is generally used for proving :

(1) whether two given regular expressions are equivalent

(2) a given grammar is ambiguous

(3) a given grammar is regular

(4) a given grammar is not regular

22. Which of the following problems is undecidable ?

(1) To determine if two finite automata are equivalent

(2) Membership problem for context free grammar

(3) Finiteness problem for finite automata

(4) Ambiguity problem for context free grammar

www.prepp.in

Prepp
Your Personal Exams Guide

23. Finite state machine can recognize language generated by .

(1) Only context free grammar
(2) Only context sensitive grammar
(3) Only regular grammar
(4) any unambiguous grammar

24. The language $L = \{a^i b c^i \mid i \geqslant 0\}$ over the alphabet {a, b, c} is :

(1) a regular language.
(2) not a deterministic context free language but a context free language.
(3) recursive and is a deterministic context free language.
(4) not recursive.

25. Suppose we want to download text documents at the rate of 100 pages per second. Assume that a page consists of an average of 24 lines with 80 characters in each line. What is the required bit rate of the channel ?

(1) 192 kbps
(2) 512 kbps
(3) 1.248 Mbps
(4) 1.536 Mbps

26. Quadrature Amplitude Modulation means changing both :

(1) Frequency and phase of the carrier.
(2) Frequency and Amplitude of the carrier.
(3) Amplitude and phase of the carrier.
(4) Amplitude and Wavelength of the carrier.

27. If a file consisting of 50,000 characters takes 40 seconds to send, then the data rate is

(1) 1 kbps
(2) 1.25 kbps
(3) 2 kbps
(4) 10 kbps

www.prepp.in

Prepp
Your Personal Exams Guide

28. Match the following :

List - I		List - II	
(a)	Data link layer	(i)	Encryption
(b)	Network layer	(ii)	Connection control
(c)	Transport layer	(iii)	Routing
(d)	Presentation layer	(iv)	Framing

Code :

	(a)	(b)	(c)	(d)
(1)	(iv)	(iii)	(i)	(ii)
(2)	(iii)	(iv)	(ii)	(i)
(3)	(iv)	(ii)	(iii)	(i)
(4)	(iv)	(iii)	(ii)	(i)

29. The address of a class B host is to be split into subnets with a 6 - bit subnet number. What is the maximum number of subnets and maximum number of hosts in each subnet ?

(1) 62 subnets and 1022 hosts
(2) 64 subnets and 1024 hosts
(3) 62 subnets and 254 hosts
(4) 64 subnets and 256 hosts

30. Which of the following statements are **true** ?

(a) The fragmentation fields in the base header section of IPv4 have moved to the fragmentation extension header in IPv6.

(b) The authentication extension header is new in IPv6.

(c) The record route option is not implemented in IPv6.

Code :

(1) (a) and (b) Only
(2) (b) and (c) Only
(3) (a) and (c) Only
(4) (a), (b) and (c)

31. Consider a full binary tree with n internal nodes, internal path length i, and external path length e. The internal path length of a full binary tree is the sum, taken over all nodes of the tree, of the depth of each node. Similarly, the external path length is the sum, taken over all leaves of the tree, of the depth of each leaf.

Which of the following is **correct** for the full binary tree?

(1) $e = i + n$
(2) $e = i + 2n$
(3) $e = 2i + n$
(4) $e = 2^n + i$

www.prepp.in

Prepp
Your Personal Exams Guide

32. You are given a sequence of n elements to sort. The input sequence consists of $\frac{n}{k}$ subsequences, each containing k elements. The elements in a given subsequence are all smaller than the elements in the succeeding subsequence and larger than the elements in the preceding subsequence. Thus, all that is needed to sort the whole sequence of length n is to sort the k elements in each of the $\frac{n}{k}$ subsequences.

The lower bound on the number of comparisons needed to solve this variant of the sorting problem is :

(1) $\Omega(n)$ (2) $\Omega\left(\frac{n}{k}\right)$ (3) $\Omega(n \lg k)$ (4) $\Omega\left(\frac{n}{k} \lg \frac{n}{k}\right)$

33. Consider the recurrence relation :

$$T(n) = 8T\left(\frac{n}{2}\right) + Cn, \text{ if } n > 1$$
$$= b, \text{ if } n = 1$$

Where b and c are constants.

The order of the algorithm corrosponding to above recurrence relation is :

(1) n (2) n^2 (3) $n \lg n$ (4) n^3

34. Consider the following two sequences :

X = <B, C, D, C, A, B, C>

and Y = <C, A, D, B, C, B>

The length of longest common subsequence of X and Y is :

(1) 5 (2) 3 (3) 4 (4) 2

35. A text is made up of the characters a, b, c, d, e each occurring with the probability 0.11, 0.40, 0.16, 0.09 and 0.24 respectively. The optimal Huffman coding technique will have the average length of :

(1) 2.40 (2) 2.16 (3) 2.26 (4) 2.15

36. An undirected graph G (V, E) contains n (n > 2) nodes named $v_1, v_2, ..., v_n$. Two nodes v_i and v_j are connected if and only if $0 < |i - j| \leq 2$. Each edge (v_i, v_j) is assigned a weight $i + j$.

The cost of the minimum spanning tree of such a graph with 10 nodes is :

(1) 88 (2) 91 (3) 49 (4) 21

www.prepp.in

Prepp
Your Personal Exams Guide

37. An XML document that adheres to syntax rules specified by XML 1.0 specification in that it must satisfy both physical and logical structured, is called :

(1) Well - formed (2) Reasonable (3) Valid (4) Sophisticated

38. Which of the following statement(s) is/are TRUE regarding Java Servelets ?

(a) A Java Servelet is a server-side component that runs on the web server and extends the capabilities of a server.

(b) A Servelet can use the user interface classes like AWT or Swing.

Code :

(1) Only (a) is TRUE. (2) Only (b) is TRUE.

(3) Both (a) and (b) are TRUE. (4) Neither (a) nor (b) is TRUE.

39. Consider the following HTML table definition :

```
<table border = 1>
    <tr>
        <td colspan = 2> Text A </td>
    </tr>
    <tr>
        <td> Text B </td>
        <td> Text C </td>
    </tr>
    <tr>
        <td rowspan = 2> Text D </td>
        <td> Text E </td>
    </tr>
    <tr>
        <td> Text F </td>
    </tr>
</table>
```

The above HTML code would render on screen as :

(1)

Text A	
Text B	Text C
Text D	Text E
Text F	

(2)

Text A	Text B
Text C	
Text D	Text E
	Text F

(3)

Text A	
Text B	Text C
Text D	Text E
	Text F

(4)

Text A	
Text B	Text C
Text D	Text E
Text F	

www.prepp.in

Prepp
Your Personal Exams Guide

40. Which of the following statements is/are TRUE ?

(a) In HTML, character entities are used to incorporate external content into a web page, such as images.

(b) Once a web server returns a cookie to a browser, the cookie will be included in all future requests from the browser to the same server.

Code :

(1) Only (a) is TRUE.
(2) Only (b) is TRUE.
(3) Both (a) and (b) are TRUE.
(4) Neither (a) nor (b) is TRUE.

41. Which of the following statements is/are TRUE regarding JAVA ?

(a) Constants that cannot be changed are declared using the 'static' keyword.

(b) A class can only inherit one class but can implement multiple interfaces.

Code :

(1) Only (a) is TRUE.
(2) Only (b) is TRUE.
(3) Both (a) and (b) are TRUE.
(4) Neither (a) nor (b) is TRUE.

42. What is the output of the following JAVA program ?

```
Class Test
{
    public static void main (String [ ] args)
    {
        Test obj = new Test ( );
        obj.start ( );
    }
    void start ( )
    {
        String stra="do";
        String strb = method (stra);
        System.out.print(":" + stra + strb);
    }
    String method (String stra)
    {
            stra=stra+"good";
            System.out.print (stra);
            return "good";
    }
}
```

(1) dogood : dogoodgood
(2) dogood : gooddogood
(3) dogood : dodogood
(4) dogood : dogood

www.prepp.in

Prepp
Your Personal Exams Guide

43. Statistical software quality assurance in software engineering involves .

(1) using sampling in place of exhaustive testing of software.

(2) surveying customers to find out their opinions about product quality.

(3) tracing each defect to its underlying cause, isolating the vital few causes, and moving to correct them.

(4) tracing each defect to its underlying causes, and using the Pareto principle to correct each problem found.

44. Which of the following statements is/are FALSE with respect to software testing ?

S1 : White-box tests are based on specifications; better at telling whether program meets specification, better at finding errors of ommission.

S2 : Black-box tests are based on code; better for finding crashes, out of bounds errors, file not closed errors.

S3 : Alpha testing is conducted at the developer's site by a team of highly skilled testers for software that is developed as a product to be used by many customers.

(1) Only S1 and S2 are FALSE. (2) Only S1 and S3 are FALSE.

(3) Only S2 and S3 are FALSE. (4) All of S1, S2, and S3 are FALSE.

45. A signal processor software is expected to operate for 91.25 days after repair, and the mean software repair time is expected to be 5 minutes. Then, the availability of the software is :

(1) 96.9862% (2) 97.9862% (3) 98.9962% (4) 99.9962%

46. Consider the method mcq ( ) :

```
int mcq (boolean a, boolean b, boolean c, boolean d)
{
    int ans=1;
    if (a) {ans = 2;}
    else if (b) {ans = 3;}
    else if (c) {
            if (d) {ans=4;}
        }
    return ans ;
}
```

If

M1 = Number of tests to exhaustively test mcq ( );

M2 = Minimum number of tests to achieve full statement coverage for mcq ( ); and

M3 = Minimum number of tests to achieve full branch coverage for mcq ( );

then (M1, M2, M3) = .

(1) (16, 3, 5) (2) (8, 5, 3) (3) (8, 3, 5) (4) (16, 4, 4)

www.prepp.in

Prepp
Your Personal Exams Guide

47. A simple stand - alone software utility is to be developed in 'C' programming by a team of software experts for a computer running Linux and the overall size of this software is estimated to be 20,000 lines of code. Considering (a, b) = (2.4, 1.05) as multiplicative and exponention factor for the basic COCOMO effort estimation equation and (c, d) = (2.5, 0.38) as multiplicative and exponention factor for the basic COCOMO development time estimation equation, approximately how long does the software project take to complete ?

(1) 10.52 months (2) 11.52 months (3) 12.52 months (4) 14.52 months

48. In Software Configuration Management (SCM), which of the following is a use-case supported by standard version control systems ?

(a) Managing several versions or releases of a software

(b) Filing bug reports and tracking their progress

(c) Allowing team members to work in parallel

(d) Identifying when and where a regression occurred

Code :

(1) Only (a), (c), and (d) (2) Only (a), (b), and (c)

(3) Only (a), (b), and (d) (4) Only (b), (c), and (d)

49. Consider the following four processes with the arrival time and length of CPU burst given in milliseconds :

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

The average waiting time for preemptive SJF scheduling algorithm is .

(1) 6.5 ms (2) 7.5 ms (3) 6.75 ms (4) 7.75 ms

50. Consider a virtual page reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1 Suppose a demand paged virtual memory system running on a computer system such that the main memory has 3 page frames. Then page replacement algorithm has minimum number of page faults.

(1) FIFO (2) LIFO (3) LRU (4) Optimal

www.prepp.in

Prepp
Your Personal Exams Guide

51. User level threads are threads that are visible to the programmer and are unknown to the kernel. The operating system kernel supports and manages kernel level threads. Three different types of models relate user and kernel level threads.

Which of the following statements is/are true ?

(a) (i) The Many - to - one model maps many user threads to one kernel thread

(ii) The one - to - one model maps one user thread to one kernel thread

(iii) The many - to - many model maps many user threads to smaller or equal kernel threads

(b) (i) Many - to - one model maps many kernel threads to one user thread

(ii) One - to - one model maps one kernel thread to one user thread

(iii) Many - to - many model maps many kernel threads to smaller or equal user threads

Code :

(1) (a) is true; (b) is false

(2) (a) is false; (b) is true

(3) Both (a) and (b) are true

(4) Both (a) and (b) are false

52. Consider a system with five processes P_0 through P_4 and three resource types A, B and C. Resource type A has seven instances, resource type B has two instances and resource type C has six instances suppose at time T_0 we have the following allocation.

Process	Allocation			Request			Available		
	A	B	C	A	B	C	A	B	C
P_0	0	1	0	0	0	0	0	0	0
P_1	2	0	0	2	0	2			
P_2	3	0	3	0	0	0			
P_3	2	1	1	1	0	0			
P_4	0	2	2	0	0	2			

If we implement Deadlock detection algorithm we claim that system is .

(1) Semaphore

(2) Deadlock state

(3) Circular wait

(4) Not in deadlock state

53. Consider a disk queue with requests for I/O to blocks on cylinders 98, 183, 37, 122, 14, 124, 65, 67. Suppose SSTF disk scheduling algorithm implemented to meet the requests then the total number of head movements are if the disk head is initially at 53.

(1) 224 (2) 248 (3) 236 (4) 240

www.prepp.in

Prepp
Your Personal Exams Guide

54. The Bounded buffer problem is also known as

(1) Producer - consumer problem (2) Reader - writer problem

(3) Dining Philosophers problem (4) Both (2) and (3)

55. In Artificial Intelligence (AI), which agent deals with happy and unhappy state ?

(1) Simple reflex agent (2) Model based agent

(3) Learning agent (4) Utility based agent

56. If b is the branching factor and m is the maximum depth of the search tree, what is the space complexity of greedy search ?

(1) O (b + m) (2) O (bm) (3) $O(b^m)$ (4) $O(m^b)$

57. Let P, Q, R and S be Propositions. Assume that the equivalences $P \Leftrightarrow (Q \vee \neg Q)$ and $Q \Leftrightarrow R$ hold. Then the truth value of the formula $(P \wedge Q) \Rightarrow ((P \wedge R) \vee S)$ is always :

(1) True (2) False

(3) Same as truth table of Q (4) Same as truth table of S

58. "If X, then Y unless Z" is represented by which of the following formulae in propositional logic ?

(1) $(X \wedge Y) \rightarrow \neg Z$ (2) $(X \wedge \neg Z) \rightarrow Y$ (3) $X \rightarrow (Y \wedge \neg Z)$ (4) $Y \rightarrow (X \wedge \neg Z)$

59. Consider the following two well-formed formulas in prepositional logic.

F1 : $P \Rightarrow \neg P$

F2 : $(P \Rightarrow \neg P) \vee (\neg P \Rightarrow P)$

Which of the following statements is correct ?

(1) F1 is Satisfiable, F2 is valid (2) F1 is unsatisfiable, F2 is Satisfiable

(3) F1 is unsatisfiable, F2 is valid (4) F1 and F2 both are Satisfiable

60. Standard planning algorithms assume environment to be

(1) Both deterministic and fully observable

(2) Neither deterministic nor fully observable

(3) Deterministic but not fully observable

(4) Not deterministic but fully observable

www.prepp.in

Prepp
Your Personal Exams Guide

61. Which of the following statements is **not** correct ?

(1) Every recursive language is recursively enumerable.

(2) $L = \{0^n 1^n 0^n \mid n = 1, 2, 3, ...\}$ is recursively enumerable.

(3) Recursive languages are closed under intersection.

(4) Recursive languages are not closed under intersection.

62. Context free grammar is not closed under :

(1) Concatenation (2) Complementation

(3) Kleene Star (4) Union

63. Consider the following languages :

$L_1 = \{a^m b^n \mid m \neq n\}$

$L_2 = \{a^m b^n \mid m = 2n+1\}$

$L_3 = \{a^m b^n \mid m \neq 2n\}$

Which one of the following statement is correct ?

(1) Only L_1 and L_2 are context free languages

(2) Only L_1 and L_3 are context free languages

(3) Only L_2 and L_3 are context free languages

(4) L_1, L_2 and L_3 are context free languages

64. A 4×4 DFT matrix is given by :

$$\frac{1}{2}\begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & x & -1 & y \\ 1 & -1 & 1 & -1 \\ 1 & -j & -1 & j \end{bmatrix}$$

$(j^2 = -1)$

Where values of x and y are , respectively.

(1) $1, -1$ (2) $-1, 1$ (3) $-j, j$ (4) $j, -j$

65. Entropy of a discrete random variable with possible values $\{x_1, x_2, ..., x_n\}$ and probability density function P(X) is :

$$H(X) = -\sum_{i=1}^{n} P(x_i) \log_b P(x_i)$$

The value of b gives the units of entropy. The unit for $b = 10$ is :

(1) bits (2) bann (3) nats (4) deca

www.prepp.in

Prepp
Your Personal Exams Guide

66. For any binary (n, h) linear code with minimum distance (2t+1) or greater $n - h \geq \log_2 \left[\sum_{i=0}^{\alpha} \binom{n}{i} \right]$ where α is :

(1) $2t+1$ (2) $t+1$ (3) $t-1$ (4) t

67. Which of the following is a valid reason for causing degeneracy in a transportation problem ? Here m is no. of rows and n is no. of columns in transportation table.

(1) When the number of allocations is $m+n-1$.

(2) When two or more occupied cells become unoccupied simultaneously.

(3) When the number of allocations is less than $m+n-1$.

(4) When a loop cannot be drawn without using unoccupied cells, except the starting cell of the loop.

68. Consider the following LPP :

Max $Z = 15x_1 + 10x_2$

Subject to the constraints

$4x_1 + 6x_2 \leq 360$

$3x_1 + 0x_2 \leq 180$

$0x_1 + 5x_2 \leq 200$

$x_1, x_2 \geq 0$

The solution of the LPP using Graphical solution technique is :

(1) $x_1 = 60, x_2 = 0$ and $Z = 900$ (2) $x_1 = 60, x_2 = 20$ and $Z = 1100$

(3) $x_1 = 60, x_2 = 30$ and $Z = 1200$ (4) $x_1 = 50, x_2 = 40$ and $Z = 1150$

69. Consider the following LPP :

Min $Z = 2x_1 + x_2 + 3x_3$

Subject to :

$x_1 - 2x_2 + x_3 \geq 4$

$2x_1 + x_2 + x_3 \leq 8$

$x_1 - x_3 \geq 0$

$x_1, x_2, x_3 \geq 0$

The solution of this LPP using Dual Simplex Method is :

(1) $x_1 = 0, x_2 = 0, x_3 = 3$ and $Z = 9$ (2) $x_1 = 0, x_2 = 6, x_3 = 0$ and $Z = 6$

(3) $x_1 = 4, x_2 = 0, x_3 = 0$ and $Z = 8$ (4) $x_1 = 2, x_2 = 0, x_3 = 2$ and $Z = 10$

www.prepp.in

Prepp
Your Personal Exams Guide

70. Consider a Takagi - Sugeno - Kang (TSK) Model consisting of rules of the form :

If x_1 is Λ_{i1} and ... and x_r is Λ_{ir}

THEN $y = f_i(x_1, x_2, ..., x_r) = b_{i0} + b_{i1} x_1 + ... + b_{ir} x_r$

assume, α_i is the matching degree of rule i, then the total output of the model is given by :

(1) $$y = \sum_{i=1}^{L} \alpha_i f_i (x_1, x_2, ..., x_r)$$

(2) $$y = \frac{\sum_{i=1}^{L} \alpha_i f_i (x_1, x_2, ..., x_r)}{\sum_{i=1}^{L} \alpha_i}$$

(3) $$y = \frac{\sum_{i=1}^{L} f_i (x_1, x_2, ..., x_r)}{\sum_{i=1}^{L} \alpha_i}$$

(4) $$y = \max_i [\alpha_i f_i (x_1, x_2 ..., x_r)]$$

71. Consider a single perceptron with sign activation function. The perceptron is represented by weight vector $[0.4 \ -0.3 \ 0.1]^t$ and a bias $\theta = 0$. If the input vector to the perceptron is $X = [0.2 \ 0.6 \ 0.5]$ then the output of the perceptron is :

(1) 1 (2) 0 (3) -0.05 (4) -1

72. The Sigmoid activation function $f(t)$ is defined as :

(1) $$\frac{1}{\exp(t) + \exp(-t)}$$ (2) $t \exp(-t)$

(3) $$\frac{1}{1 + \exp(t)}$$ (4) $$\frac{1}{1 + \exp(-t)}$$

www.prepp.in

Prepp
Your Personal Exams Guide

73. Consider the following statements :

(a) UNIX provides three types of permissions
- Read
- Write
- Execute

(b) UNIX provides three sets of permissions
- permission for owner
- permission for group
- permission for others

Which of the above statement/s is/are **true** ?

(1) Only (a) (2) Only (b)
(3) Both (a) and (b) (4) Neither (a) nor (b)

74. Which of the following routing technique / techniques is / are used in distributed systems ?

(a) Fixed Routing
(b) Virtual Routing
(c) Dynamic Routing

Code :

(1) (a) only (2) (a) and (b) only (3) (c) only (4) All (a), (b), (c)

75. Match the following WINDOWS system calls and UNIX system calls with reference to process control and File manipulation.

	Windows		**UNIX**
(a)	Create - process ( )	(i)	Open ( )
(b)	WaitForSingleObject ( )	(ii)	Close ( )
(c)	CreateFile ( )	(iii)	Fork ( )
(d)	CloseHandle ( )	(iv)	Wait ( )

Code :

	(a)	**(b)**	**(c)**	**(d)**
(1)	(iii)	(iv)	(i)	(ii)
(2)	(iv)	(iii)	(i)	(ii)
(3)	(iv)	(iii)	(ii)	(i)
(4)	(iii)	(iv)	(ii)	(i)

- o O o -

www.prepp.in

Prepp
Your Personal Exams Guide

Space For Rough Work

Prepp
Your Personal Exams Guide