12

QUESTION PAPER SERIES CODE
A

Centre Name : _____

Roll No. : _____

Name of Candidate : _____

S A U

Entrance Test for M.Phil./Ph.D. (Computer Science), 2015

[PROGRAMME CODE : PCS]

Time : 3 hours *Maximum Marks* : 70

INSTRUCTIONS FOR CANDIDATES

Candidates must carefully read the following instructions before attempting the Question Paper :

(i) Write your Name, Roll Number and Centre Name in the space provided for the purpose on the top of this Question Paper and in the OMR/Answer Sheet.

(ii) This Question Paper has Two Parts : Part—A and Part—B.

(iii) Part—A (Objective-type) has 30 questions of **1** mark each. All questions are compulsory.

(iv) Part—B (Objective-type) has 40 questions of **1** mark each. All questions are compulsory.

(v) **One-fourth of marks assigned to any question in both Part—A and Part—B will be deducted for wrong answers.**

(vi) *Symbols have their usual meanings.*

(vii) **Please darken the appropriate Circle of 'Question Paper Series Code' and 'Programme Code' on the OMR Sheet in the space provided.**

(viii) Part—A and Part—B (Multiple Choice) questions should be answered on OMR Sheet.

(ix) Answers written by the candidates inside the Question Paper will **NOT** be evaluated.

(x) Calculators and Log Tables may be used. Mobile Phones are **NOT** allowed.

(xi) Pages at the end have been provided for Rough Work.

(xii) **Return the Question Paper and the OMR/Answer Sheet** to the Invigilator at the end of the Entrance Test.

(xiii) **DO NOT FOLD THE OMR/ANSWER SHEET.**

INSTRUCTIONS FOR MARKING ANSWERS IN THE 'OMR SHEET'

Use BLUE/BLACK Ballpoint Pen Only

1. **Please ensure that you have darkened the appropriate Circle of 'Question Paper Series Code' and 'Programme Code' on the OMR Sheet in the space provided.**

   Example :

   Question Paper Series Code

   Write Question Paper Series Code A or B and darken the appropriate circle.

   ☐ A or B

   ● Ⓑ

   Programme Code

   Write Programme Code out of 14 codes given and darken the appropriate circle.

   Write Programme Code ☐

MEC	○	MAM	○	PCS	●
MSO	○	MLS	○	PBT	○
MIR	○	PEC	○	PAM	○
MCS	○	PSO	○	PLS	○
MBT	○	PIR	○		

2. Use only Blue/Black Ballpoint Pen to darken the Circle. Do not use Pencil to darken the Circle for Final Answer.
3. Please darken the whole Circle. ●
4. Darken ONLY ONE CIRCLE for each question as shown below in the example :

   Example :

Wrong	Wrong	Wrong	Wrong	Correct
● ⓑ ⓒ ●	Ⓐ ⓑ ⓒ ⓓ	Ⓐ ⓑ ⓒ Ⓓ	◉ ⓑ ⓒ ●	ⓐ ⓑ ⓒ ●

5. Once marked, no change in the answer is allowed.
6. Please do not make any stray marks on the OMR Sheet.
7. Please do not do any rough work on the OMR Sheet.
8. Mark your answer only in the appropriate circle against the number corresponding to the question.
9. **One-fourth of marks assigned to any question in both Part—A and Part—B will be deducted for wrong answers.**
10. Write your six-digit Roll Number in small boxes provided for the purpose; and also darken the appropriate circle corresponding to respective digits of your Roll Number as shown in the example below.

    Example :

    ROLL NUMBER

1	3	5	7	2	0
●	①	①	①	①	①
②	②	②	②	●	②
③	●	③	③	③	③
④	④	④	④	④	④
⑤	⑤	●	⑤	⑤	⑤
⑥	⑥	⑥	⑥	⑥	⑥
⑦	⑦	⑦	●	⑦	⑦
⑧	⑧	⑧	⑧	⑧	⑧
⑨	⑨	⑨	⑨	⑨	⑨
⓪	⓪	⓪	⓪	⓪	●

PART—A

1. Which of the following statements is false?

   (a) A proposition is a declarative sentence to which we can assign a truth value, both true and false.

   (b) Two propositional forms are equivalent if they have the same truth table.

   (c) A propositional form that is always true is called a tautology.

   (d) A propositional form that is always false is called a contradiction.

2. Which of the following statements is true about the relation $x^2 + y^2 = 25$?

   (a) It is a function because there exists one y-coordinate for each x-coordinate.

   (b) It is a function because there exists one x-coordinate for each y-coordinate.

   (c) It is not a function because there are multiple x-values for a given y-value.

   (d) It is not a function because there are multiple y-values for a given x-value.

3. The solution to the following linear system

   $$y = -2x + 5,\ 4x + 2y - 15 = 0$$

   is

   (a) $5, -5$

   (b) $5, -2{\cdot}5$

   (c) There is no solution

   (d) There are infinite solutions

4. Which of the following first-order predicate logic is wrong?

   (a) "There is a bunny who is a cute" : $\exists x\ \text{IsABunny}(x) \wedge \text{IsCute}(x)$

   (b) "Sister-in-law" : $\forall x, y\ \ \text{SisterInLaw}(x, y) \Rightarrow \exists z\ \ \text{Female}(x) \wedge \text{Spouse}(y, z) \wedge \text{Siblings}(x, z)$

   (c) "Every child who has a Chinpokomon card is cool" : $\forall x, y\ \text{Child}(x) \wedge \text{ChinpokomonCard}(y) \wedge \text{Owns}(x, y) \Rightarrow \text{Cool}(x)$

   (d) "There is only one Elvis" : $\exists x\ \text{IsElvis}(x) \wedge \exists y\ \text{IsElvis}(y) \Rightarrow x = y$

5. What does the following declaration mean?

```
int (* ptr) [10];
```

(a) ptr is an array of pointers to 10 integers

(b) ptr is an array of 10 integers

(c) ptr is a pointer to array

(d) ptr is a pointer to an array of 10 integers

6. What is the return value of the following function?

```
int fun (int a, int b, int c)
{
    if ((a >= b) && (c < b)) return b;
    else if (a >= b) return fun (a, c, b);
    else return fun (b, a, c);
}
```

(a) Maximum of a, b and c

(b) Minimum of a, b and c

(c) Finds the middle number of a, b and c

(d) None of the above

7. What is the output of the following C code?

```
# include <stdio.h>
int main () {
    int f = 0, g = 1;
    int i;
    for (i = 0; i < 8; i++) {
        printf ("%d", f);
        f = f + g;
        g = f – g;
    }
    printf ("\n");
    return 0;
}
```

(a) 0,1,1,1,3,6,12,24

(b) 0,1,1,0,1,1,0,1

(c) 0,1,1,2,3,5,8,13

(d) None of the above

8. What is the return value of the following function, if we pass 5 as an argument?

```
int func (int i) {
  if (i%2) return (i++);
  else return func (func (i–1));
}
```

(a) 5

(b) 15

(c) 25

(d) None of the above

9. A vertex of an equivalent triangle is (2, 3) and the opposite side is $x + y = 2$. The equations of the other sides are

(a) $(2 \pm \sqrt{3})x - y = 1 \pm 2\sqrt{3}$

(b) $(2 \pm \sqrt{3})x - y = 1 \mp 2\sqrt{3}$

(c) $(1 \pm 2\sqrt{3})x - y = 2 \pm 2\sqrt{3}$

(d) $(2 \pm \sqrt{3})x + y = 1 \pm 2\sqrt{3}$

10. Equation of a circle which passes through the point (3, 6) and touches the axes, is

(a) $x^2 + y^2 + 6x + 6y + 3 = 0$

(b) $x^2 + y^2 - 6x - 6y - 9 = 0$

(c) $x^2 + y^2 - 6x - 6y + 9 = 0$

(d) $x^2 + y^2 + 6x + 6y - 3 = 0$

11. The locus of the centres of the circles passing through the intersection of the circles $x^2 + y^2 = 1$ and $x^2 + y^2 - 2x + y = 0$ is

(a) $x + 2y = 0$

(b) $2x - y = 1$

(c) a circle

(d) a pair of lines

12. The vectors $\hat{i}+\hat{j}+\hat{k}$ and $\hat{i}+a\hat{j}+a^2\hat{k}$, when $a=\omega$ (complex cube root of unity) are

(a) orthonormal

(b) orthogonal

(c) parallel

(d) collinear

13. Which of the following is the 2421 code of the number $(6028)_{10}$?

(a) 0110 0000 0010 0111

(b) 1001 0011 0101 1010

(c) 1100 0000 0010 1101

(d) None of the above

14. When expressed as the product of maxterms, the function $y'z+wxy'+wxz'+w'x'z$ becomes

(a) $\Pi(1,2,4,6,7,8,10,11,15)$

(b) $\Pi(0,2,4,6,8,10,12,14,15)$

(c) $\Pi(0,1,2,4,6,7,8,10,12,15)$

(d) $\Pi(0,2,4,6,7,8,10,11,15)$

15. Which of the following is not a sequential component?

(a) Flip-flop

(b) Multiplexor

(c) Ring counter

(d) None of the above

16. A sequential circuit is represented by

(a) a state table

(b) a state diagram

(c) a finite-state machine

(d) All of the above

17. The eigenvalues of two matrices A and BAB^{-1} are

(a) the same

(b) different

(c) always zero

(d) all of magnitude 1

18. If the determinant of a matrix A is zero, then one of its eigenvalue is

(a) 1

(b) 0

(c) -1

(d) 2

19. For what value of a, is the system of equations $x+y+z=0$; $x+2y+3z=0$; $x+2y+az=0$ inconsistent?

(a) 3

(b) 2

(c) 1

(d) None of the above

20. Given that the matrix $M=\begin{bmatrix}\cos\omega t & -\sin\omega t & 0\\ \sin\omega t & \cos\omega t & 0\\ 0 & 0 & 1\end{bmatrix}$ is orthogonal, then M^{-1} is

(a) $\begin{bmatrix}\sin\omega t & \cos\omega t & 0\\ -\cos\omega t & \sin\omega t & 0\\ 0 & 0 & 1\end{bmatrix}$

(b) $\begin{bmatrix}\cos\omega t & +\sin\omega t & 0\\ -\sin\omega t & \cos\omega t & 0\\ 0 & 0 & 1\end{bmatrix}$

(c) $\begin{bmatrix}\sin\omega t & -\cos\omega t & 0\\ \cos\omega t & \sin\omega t & 0\\ 0 & 0 & 1\end{bmatrix}$

(d) None of the above

21. If a, b and c are the roots of the equation $x^3+px+q=0$ (with $p,\ q\neq 0$), then the value of the given determinant $\begin{vmatrix}a & b & c\\ b & c & a\\ c & a & b\end{vmatrix}$ is

(a) $-p^3$

(b) p^3-3q

(c) p^3

(d) p^3+3q

22. Which of the following would indicate that a data set is not bell-shaped?

(a) The range is equal to 5 standard deviations

(b) The range is larger than the interquartile range

(c) The mean is much smaller than the median

(d) There are no outliers

23. If the sum and product of the mean and variance of a binomial distribution are 24 and 128 respectively, then $(p+q)^n$ is

(a) $\left(\frac{1}{7}+\frac{1}{8}\right)^{12}$ (b) $\left(\frac{1}{4}+\frac{3}{4}\right)^{16}$

(c) $\left(\frac{1}{6}+\frac{5}{6}\right)^{24}$ (d) $\left(\frac{1}{2}+\frac{1}{2}\right)^{32}$

24. If X is a Poisson variate such that $P(2) = 9P(4) + 90P(6)$, then the mean of X is

(a) ± 1

(b) ± 2

(c) ± 3

(d) None of the above

25. Suppose that 5 percent of men and 0·25 percent of women are color-blind. A color-blind person is chosen at random. What is the probability of this person being male? Assume that there is equal number of males and females.

(a) 20/21

(b) 19/21

(c) 18/21

(d) None of the above

26. Which of the following is a valid objective function for a linear programming problem?

(a) Max $5xy$

(b) Min $4x + 3y + (2/3)z$

(c) Max $5x^2 + 6y^2$

(d) Min $(x_1 + x_2)/x_3$

27. For the optimization problem "Maximum $f(.)$ subject to $g(.) \leq 0$", a sufficient set of conditions for a local maximum to be a global maximum, is

(a) $f(.)$ convex and $g(.)$ convex

(b) $f(.)$ convex and $g(.)$ concave

(c) $f(.)$ concave and $g(.)$ convex

(d) $f(.)$ concave and $g(.)$ concave

28. Consider the Hessian H of $f(x_1, x_2)$. If $f(x_1, x_2)$ is concave, then the eigenvalues of H are

(a) $e_1 \geq e_2 \geq 0$

(b) $e_1 \leq 0, e_2 \leq 0$

(c) $e_1 \geq 0, e_2 \leq 0$

(d) $e_1 \leq 0, e_2 \geq 0$

29. What is the maximum possible value for the objective function in the following linear programming problem?

$$\text{Maximize } 12X + 10Y$$

subject to

$$4X + 3Y \leq 480$$
$$2X + 3Y \leq 360$$
$$X, Y \geq 0$$

(a) 360

(b) 480

(c) 1520

(d) 1560

30. If you want to find the least squares line of the form $y = ax + b$ for the given data (2, 0), (−1, 1), (1, 2), then which of the following error functions would you need to minimize in order to determine the values of a and b?

(a) $E(a, b) = (a + 2b)^2 + (a - b + 1)^2 + (a + b - 3)^2$

(b) $E(a, b) = (2a + b)^2 + (-a - b + 1)^2 + (a + b - 2)^2$

(c) $E(a, b) = (2a + b)^2 + (-a + b - 1)^2 + (a + b - 2)^2$

(d) $E(a, b) = (a + 2b)^2 + (-a - b + 1)^2 + (a + b - 2)^2$

PART—B

31. A binary tree of depth d is an almost complete binary tree, if

(a) each leaf in the tree is either at level d or at level $d-1$

(b) for any node n in the tree with a right descendent at level d all the left descendents of n that are leaves, are also at level d

(c) Both (a) and (b)

(d) None of the above

32. An adjacency matrix representation of a graph cannot contain information of

(a) nodes

(b) edges

(c) direction of edges

(d) parallel edges

33. What is the postfix form of the following prefix $*+ab-cd$?

(a) $ab+cd-*$

(b) $abc+*-$

(c) $ab+*cd-$

(d) $ab*+cd-$

34. The process of accessing data stored in a serial access memory is similar to manipulating data on a

(a) heap

(b) queue

(c) stack

(d) binary tree

35. In a circular linked list

(a) components are all linked together in some sequential manner

(b) there is no beginning and no end

(c) components are arranged hierarchically

(d) forward and backward traversals within the list is permitted

36. The searching technique that takes $O(1)$ time to find a data is

(a) linear search

(b) binary search

(c) hashing

(d) tree search

37. The quick sort algorithm exploits which of the following design techniques?

(a) Greedy

(b) Dynamic programming

(c) Divide and conquer

(d) Backtracking

38. Let there be an array of length N and the selection sort algorithm is used to sort it. How many times a swap function is called to complete the execution?

(a) $N \log N$ times

(b) $\log N$ times

(c) N times

(d) $N - 1$ times

39. Given two non-negative functions $f(n) = 5n^2 + 6n + 1$ and $g(n) = n^2$. The upper-bound value of C is

(a) 5

(b) 12

(c) 6

(d) 11

40. Dijkstra's algorithm

(a) has greedy approach to find all shortest paths

(b) has both greedy and dynamic approach to find all shortest paths

(c) has greedy approach to compute single-source shortest paths to all other vertices

(d) has both greedy and dynamic approach to compute single-source shortest paths to all other vertices

41. Determine the number of page faults when references to pages occur in the order –1, 2, 4, 5, 2, 1, 2, 4. Assume that the main memory can accommodate 3 pages and the main memory already has the pages, 1 and 2 with page 1 having been brought earlier than page 2. Assume LRU algorithm is used.

(a) 3

(b) 5

(c) 4

(d) None of the above

42. Consider the three processes *P*1, *P*2 and *P*3 shown in the table :

Process	*Arrival time*	*Time units required*
*P*1	0	5
*P*2	1	7
*P*3	3	4

The completion order of the three processes under the policies FCFS and RR2 (round robin scheduling with CPU quantum of 2 time units) are

(a) FCFS : *P*1, *P*2, *P*3; RR2 : *P*1, *P*2, *P*3

(b) FCFS : *P*1, *P*3, *P*2; RR2 : *P*1, *P*3, *P*2

(c) FCFS : *P*1, *P*2, *P*3; RR2 : *P*1, *P*3, *P*2

(d) FCFS : *P*1, *P*3, *P*2; RR2 : *P*1, *P*2, *P*3

43. The following program consists of three concurrent processes and three binary semaphores. The semaphores are initialized as *S*0 = 1, *S*1 = 0, *S*2 = 0 :

*Process P*0	*Process P*1	*Process P*2

while (true) {
wait (*S*0);
print '0';
release (*S*1);
release (*S*2);
}
	wait (*S*1);
	release (*S*0);
		wait (*S*2);
		release (*S*0);

How many times will process *P*0 print '0'?

(a) At least twice

(b) Exactly twice

(c) Exactly thrice

(d) Exactly once

44. What is the correct matching for the following pairs?

(A)	Disk scheduling	(1)	Round robin
(B)	Batch processing	(2)	SCAN
(C)	Time sharing	(3)	LIFO
(D)	Interrupt processing	(4)	FIFO

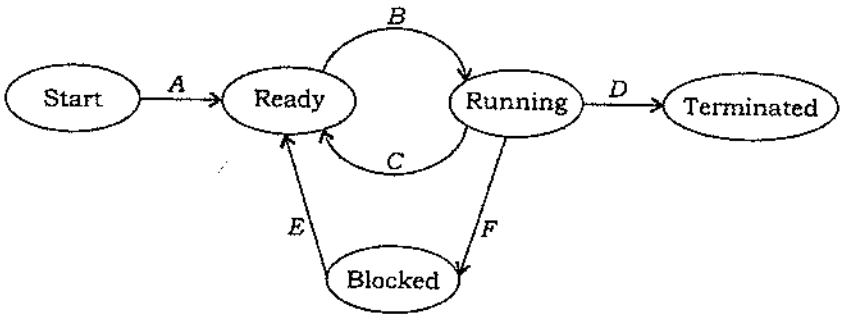
(a) (A)–(3), (B)–(4), (C)–(2), (D)–(1)

(b) (A)–(4), (B)–(3), (C)–(2), (D)–(1)

(c) (A)–(2), (B)–(4), (C)–(1), (D)–(3)

(d) (A)–(2), (B)–(1), (C)–(4), (D)–(3)

45. In the following process state transition diagram for a uniprocessor system, assume that there are always some processes in the ready state :



Now consider the following statements :

I. If a process makes a transition *D*, it would result in another process-making transition *A* immediately.

II. A process P_2 in blocked state can make transition *E* while another process P_1 is in running state.

III. The OS uses preemptive scheduling.

IV. The OS uses non-preemptive scheduling.

Which of the above statements are true?

(a) I and II

(b) I and III

(c) II and III

(d) II and IV

46. The number of 3's in the output of the following C program

```
main ( )
{
  printf ("1"); fork ( );
  printf ("2"); fork ( );
  fork ( ); printf ("3");
}
```

is

(a) 1

(b) 8

(c) 4

(d) 2

47. The program

```
main ( )
{
    printf ("x");
    fflush (stdout);
    system ("date");
}
```

(a) gives the same output as the program

```
main ( )
  {
    printf ("x\n");
    system ("date");
  }
```

(b) prints x before displaying date

(c) prints x after displaying date

(d) All of the above

48. Consider five processes $P0$ through $P4$; and three types of resources A (10 instances), B (5 instances) and C (7 instances). Consider the following snapshot of a system :

	Allocation	*Need*	*Available*
	A B C	*A B C*	*A B C*
P0	0 1 0	7 4 3	2 3 0
P1	3 0 2	0 2 0	
P2	3 0 2	6 0 0	
P3	2 1 1	0 1 1	
P4	0 0 2	4 3 1	

The safe execution sequence is

(a) $< P1, P3, P0, P4, P2 >$

(b) $< P2, P3, P4, P0, P1 >$

(c) $< P0, P3, P4, P1, P2 >$

(d) $< P1, P3, P4, P0, P2 >$

49. If the total number of available frames is 50 and there are two processes one of 10 pages and the other of 5 pages, then how much of memory would be proportionally allocated to each of these processes?

(a) Depends on the process requirements

(b) 33 and 16 frames respectively

(c) Memory is allocated equally for both

(d) 5 and 10 respectively

50. Suppose a disk has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143 and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is for blocks at cylinders—86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130.

Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for C-Scan disk-scheduling algorithm?

(a) 7081

(b) 1745

(c) 9769

(d) 9813

51. A dynamic partitioning scheme is being used and the following is the memory configuration at a given point in time :

20M	20M	40M	60M	20M	10M	60M	40M	20M	30M	40M	40M

The shaded areas are allocated blocks; the white areas are free blocks. The next three memory requests are for 40M, 20M and 10M. Indicate the starting address for each of the three blocks using the next fit placement algorithms.

(a) 80M, 20M, 120M

(b) 230M, 20M, 160M

(c) 80M, 120M, 160M

(d) 80M, 230M, 360M

52. Let M be a node that represents a 'if-then-else' node in a program graph. Let the number of paths from its 'if' part to 'end' node is y, and from the 'else' part to the 'end' node is z. If the number of paths from the 'start' node to the node M is x, then the total number of paths through M is

(a) $xy+z$

(b) $xz+y$

(c) $x+y+z$

(d) $x(y+z)$

53. Which of the following types of maintenance takes the maximum chunk of the total maintenance effort in a typical life cycle of a software product?

(a) Adaptive maintenance

(b) Corrective maintenance

(c) Preventive maintenance

(d) Perfective maintenance

54. Which of the following testing methods is normally used as the acceptance test for a software system?

(a) Regression testing

(b) Integration testing

(c) Unit testing

(d) Functional testing

55. The following program is to be tested for statement coverage :

```
begin
    if (a == b) {S1; exit;}
    else if (c == d) {S2;}
        else {S3; exit;}
    S4;
end
```

The test cases $T1$, $T2$, $T3$ and $T4$ given below are expressed in terms of the properties satisfied by the values of variables a, b, c and d. The exact values are not given.

$T1$: a, b, c and d are all equal

$T2$: a, b, c and d are all distinct

$T3$: $a = b$ and $c \mathrel{!}= d$

$T4$: $a \mathrel{!}= b$ and $c = d$

Which of the test suites given below ensures coverage of statements $S1$, $S2$, $S3$ and $S4$?

(a) $T1$, $T2$, $T3$ (b) $T2$, $T4$

(c) $T3$, $T4$ (d) $T1$, $T2$, $T4$

56. The reliability of a program be 0·8. The reliability of an equivalent program (i.e., another program that serves the same purpose) is 0·9. The probability that both the programs give the wrong result for the same input is

(a) 0·72

(b) 1·7

(c) 0·1

(d) 0·02

57. Which of the following is not necessary to apply agility to a software process?

(a) Eliminate the use of project planning and testing

(b) Only essential work products are produced

(c) Process allows team to streamline tasks

(d) Uses incremental product delivery strategy

58. One of the header fields in an IP datagram is the Time to Live (TTL) field. Which of the following statements best explains the need for this field?

(a) It can be used to prioritize packets

(b) It can be used to reduce delays

(c) It can be used to optimize throughput

(d) It can be used to prevent packet looping

59. A 2 km long broadcast LAN has 10^7 bps bandwidth and uses CSMA/CD. The signal travels along the wire at 2×10^8 m/s. What is the minimum packet size that can be used on this network?

(a) 50 bytes

(b) 100 bytes

(c) 200 bytes

(d) None of the above

60. Suppose Host *A* wants to send a large file to Host *B*. The path from Host *A* to Host *B* has three links of rates $R1 = 500$ kbps, $R2 = 2$ Mbps and $R3 = 1$ Mbps. Assuming no other traffic in the network, what is the throughput for the file transfer?

(a) 500 kbps

(b) 2 Mbps

(c) 1 Mbps

(d) 1·67 Mbps

61. A TCP message consisting of 2100 bytes is passes to IP for delivery across two networks. The first network can carry a maximum payload of 1200 bytes per frame and the second network can carry a maximum payload of 400 bytes per frame, excluding network overhead. Assume that IP overhead per packet is 20 bytes. What is the total IP overhead in the second network for this transmission?

(a) 40 bytes (b) 80 bytes

(c) 120 bytes (d) 160 bytes

62. Let $R = \{A, B, C, D, E, F\}$ be a relation schema with the following dependencies :

$$C \rightarrow F,\ E \rightarrow A,\ EC \rightarrow D,\ A \rightarrow B$$

Which of the following is a key for R?

(a) CD

(b) EC

(c) AE

(d) A

63. The dependency preservation decomposition is a property to decompose database schema *D*, in which each functional dependency $X \rightarrow Y$ specified in F

(a) appeared directly in one of the relation schemes R_i in the decomposed database schema *D*

(b) could be inferred from dependencies that appear in some R_i

(c) Both (a) and (b)

(d) None of the above

64. Which of the following is not an implementational data model?

(a) Relational

(b) Object-oriented

(c) Network

(d) UML

65. A specialization $\{S_1, S_2, \cdots, S_n\}$ of a superclass G is total if we always have

(a) $\sum S_i = G$

(b) $\bigcup S_i = G$

(c) $(\bigcup S_i)$ intersection $G = \varnothing$

(d) None of the above

66. MIPS stands for

(a) Microprocessor without Interlocked Pipeline Stages

(b) Microprocessor with Interlocked Pipeline Stages

(c) Both (a) and (b)

(d) None of the above

67. As per IEEE 754 floating-point standard, the fraction part of a double-precision floating number can be expressed with

(a) 23 bits

(b) 56 bits

(c) 52 bits

(d) 11 bits

68. In the biased notation for the 32-bit binary numbers, the most negative value is expressed by

(a) $00,,0000_{two}$

(b) $11,,1111_{two}$

(c) $10,,0000_{two}$

(d) None of the above

69. In a digital circuit the minimum time during which the input must remain valid after the clock edge is called the

(a) hold time

(b) setup time

(c) Both (a) and (b)

(d) None of the above

70. Code scheduling is a technique used for addressing the issue of

(a) data hazard

(b) control hazard

(c) structural hazard

(d) scheduling hazard

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