

## CSIR UGC NET COMPUTER SCIENCE JUNE 2014 – PAPER II

### IFAS SOLVED PAPER



## CSIR NET 2020 RESULT



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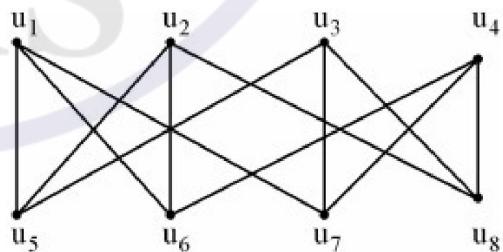
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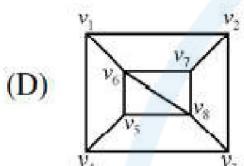
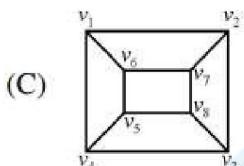
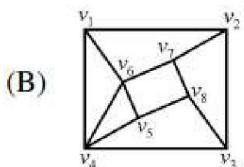
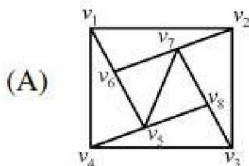
1. Infrared signals can be used for short range communication in a closed area using \_\_\_\_\_ propagation.  
 (A) ground  
 (B) sky  
 (C) line of sight  
 (D) space
  2. A bridge has access to \_\_\_\_\_ address in the same network.  
 (A) Physical  
 (B) Network  
 (C) Datalink  
 (D) Application
  3. The minimum frame length for 10 Mbps Ethernet is \_\_\_\_\_ bytes and maximum is \_\_\_\_\_ bytes.  
 (A) 64 & 128  
 (B) 128 & 1518  
 (C) 1518 & 3036  
 (D) 64 & 1518
  4. The bit rate of a signal is 3000 bps. If each signal unit carries 6 bits, the baud rate of the signal is \_\_\_\_\_.  
 (A) 500 baud/sec  
 (B) 1000 baud/sec  
 (C) 3000 baud/sec  
 (D) 18000 baud/sec.
  5. Match the following:
 

List – I	List – II
a. Physical layer	i. Allow resources to network access
b. Datalink layer	ii. Move packets from one destination to other
c. Network layer	iii. Process to process message delivery
d. Transport layer	iv. Transmission of bit stream
e. Application Layer	v. Formation of frames
- Codes:**
- |        |     |    |     |     |
|--------|-----|----|-----|-----|
| a      | b   | c  | d   | e   |
| (A) iv | v   | ii | iii | i   |
| (B) v  | iv  | i  | ii  | iii |
| (C) i  | iii | ii | v   | iv  |
| (D) i  | ii  | iv | iii | v   |
6. A grammar G is LL(1) if and only if the following conditions hold for two distinct productions  $A \rightarrow \alpha \mid \beta$ 
    - I.  $\text{First } (\alpha) \cap \text{First } (\beta) \neq \{\text{a}\}$  where a is some terminal symbol of the grammar.
    - II.  $\text{First } (\alpha) \cap \text{First } (\beta) \neq \lambda$
    - III.  $\text{First } (\alpha) \cap \text{Follow } (A) = \phi$  if  $\lambda \in \text{First } (\beta)$
 (A) I and II  
 (B) I and III  
 (C) II and III  
 (D) I, II and III
  7. Which of the following suffices to convert an arbitrary CFG to an LL(1) grammar?  
 (A) Removing left recursion alone  
 (B) Removing the grammar alone  
 (C) Removing left recursion and factoring the grammar  
 (D) None of the above
  8. A shift reduce parser suffers from  
 (A) shift reduce conflict only  
 (B) reduce conflict only  
 (C) both shift reduce conflict and reduce conflict  
 (D) shift handle and reduce handle conflicts
  9. The context free grammar for the language  $L = \{a^n b^m c^k \mid k = |n - m|, n \geq 0, m \geq 0, k \geq 0\}$  is  
 (A)  $S \rightarrow S_1 S_3, S_1 \rightarrow aS_1c \mid S_2 \mid \lambda, S_2 \rightarrow aS_2b \mid \lambda, S_3 \rightarrow aS_3b \mid S_4 \mid \lambda, S_4 \rightarrow bS_4c \mid \lambda$   
 (B)  $S \rightarrow S_1 S_3, S_1 \rightarrow aS_1S_2c \mid \lambda, S_2 \rightarrow aS_2b \mid \lambda, S_3 \rightarrow aS_3b \mid S_4 \mid \lambda, S_4 \rightarrow bS_4c \mid \lambda$   
 (C)  $S \rightarrow S_1 \mid S_2, S_1 \rightarrow aS_1S_2c \mid \lambda, S_2 \rightarrow aS_2b \mid \lambda, S_3 \rightarrow aS_3b \mid S_4 \mid \lambda, S_4 \rightarrow bS_4c \mid \lambda$   
 (D)  $S \rightarrow S_1 \mid S_3, S_1 \rightarrow aS_1c \mid S_2 \mid \lambda, S_2 \rightarrow aS_2b \mid \lambda, S_3 \rightarrow aS_3b \mid S_4 \mid \lambda, S_4 \rightarrow bS_4c \mid \lambda$
  10. The regular grammar for the language  $L = \{w \mid n_a(w) \text{ and } n_b(w) \text{ are both even}, w \in \{a, b\}^*\}$  is given by :  
 (Assume, p, q, r and s are states)
    - (A)  $p \rightarrow aq \mid br \mid \lambda, q \rightarrow bs \mid ap$   
 r  $\rightarrow$  as  $\mid$  bp, s  $\rightarrow$  ar  $\mid$  bq, p and s are initial and final states.
    - (B)  $p \rightarrow aq \mid br, q \rightarrow bs \mid ap$   
 r  $\rightarrow$  as  $\mid$  bp, s  $\rightarrow$  ar  $\mid$  bq, p and s are initial and final states.
    - (C)  $p \rightarrow aq \mid br \mid \lambda, q \rightarrow bs \mid ap$   
 r  $\rightarrow$  as  $\mid$  bp, s  $\rightarrow$  ar  $\mid$  bq p is both initial and final states.
    - (D)  $p \rightarrow aq \mid br, q \rightarrow bs \mid ap$   
 r  $\rightarrow$  as  $\mid$  bp, s  $\rightarrow$  ar  $\mid$  bq p is both initial and final states.

- 11. KPA in CMM stands for**  
 (A) Key Process Area  
 (B) Key Product Area  
 (C) Key Principal Area  
 (D) Key Performance Area
- 12. Which one of the following is not a risk management technique for managing the risk due to unrealistic schedules and budgets?**  
 (A) Detailed multi source cost and schedule estimation.  
 (B) Design cost  
 (C) Incremental development  
 (D) Information hiding
- 13. \_\_\_\_\_ of a system is the structure or structures of the system which comprise software elements, the externally visible properties of these elements and the relationship amongst them.**  
 (A) Software construction  
 (B) Software evolution  
 (C) Software architecture  
 (D) Software reuse
- 14. In function point analysis, the number of complexity adjustment factors is**  
 (A) 10  
 (B) 12  
 (C) 14  
 (D) 20
- 15. Regression testing is primarily related to**  
 (A) Functional testing  
 (B) Development testing  
 (C) Data flow testing  
 (D) Maintenance testing
- 16. How many different truth tables of the compound propositions are there that involve the propositions p & q?**  
 (A) 2  
 (B) 4  
 (C) 8  
 (D) 16
- 17. A Boolean function F is called self-dual if and only if**  
 $F(x_1, x_2, \dots, x_n) = F(\bar{x}_1, \bar{x}_2, \dots, \bar{x}_n)$   
**How many Boolean functions of degree n are self-dual?**  
 (A)  $2^n$   
 (B)  $(2)^{2^n}$   
 (C)  $(2)^{n^2}$   
 (D)  $(2)^{2^{n-1}}$
- 18. Which of the following statement(s) is (are) not correct?**  
 i. The 2's complement of 0 is 0.  
 ii. In 2's complement, the left most bit cannot be used to express a quantity.  
 iii. For an n-bit word (2's complement) which includes the sign bit, there are  $2^{n-1}$  positive integers,  $2^{n+1}$  negative integers and one 0 for a total of  $2^n$  unique states.  
 iv. In 2's complement the significant information is contained in the 1's of positive numbers and 0's of the negative numbers.  
 (A) i & iv  
 (B) i & ii  
 (C) iii  
 (D) iv
- 19. The notation  $\exists! xP(x)$  denotes the proposition “there exists a unique x such that  $P(x)$  is true”. Give the truth values of the following statements:**  
 I.  $\exists! xP(x) \rightarrow \exists xP(x)$   
 II.  $\exists! x \neg P(x) \rightarrow \neg \forall xP(x)$   
 (A) Both I & II are true.  
 (B) Both I & II are false.  
 (C) I – false, II – true  
 (D) I – true, II – false
- 20. Give a compound proposition involving propositions p, q and r that is true when exactly two of p, q and r are true and is false otherwise.**  
 (A)  $(p \vee q \wedge \neg r) \wedge (p \wedge \neg q \wedge r) \wedge (\neg p \wedge q \wedge r)$   
 (B)  $(p \wedge q \wedge \neg r) \wedge (p \vee q \wedge \neg r) \wedge (\neg p \wedge q \wedge r)$   
 (C)  $(p \wedge q \wedge \neg r) \vee (p \wedge \neg q \wedge r) \wedge (\neg p \wedge q \wedge r)$   
 (D)  $(p \wedge q \wedge \neg r) \vee (p \wedge \neg q \wedge r) \vee (\neg p \wedge q \wedge r)$
- 21. Consider the graph given below as:**



Which one of the following graph is isomorphic to the above graph?



22. The upper bound and lower bound for the number of leaves in a B-tree of degree K with height h is given by:
- $K^h$  and  $2[K/2]^{h-1}$
  - $K * h$  and  $2[K/2]^{h-1}$
  - $K^h$  and  $2[K/2]^{h-1}$
  - $K * h$  and  $2[K/2]^{h-1}$

23. Consider a complete bipartite graph  $k_{m,n}$ . For which values of m and n does this, complete graph have a Hamilton circuit
- $m = 3, n = 2$
  - $m = 2, n = 3$
  - $m = n \geq 2$
  - $m = n \geq 3$

24. Big-O estimates for the factorial function and the logarithm of the factorial function i.e.  $n!$  and  $\log n!$  is given by
- $O(n!)$  and  $O(n \log n)$
  - $O(n^n)$  and  $O(n \log n)$
  - $O(n!)$  and  $O(\log n!)$
  - $O(n^n)$  and  $O(\log n!)$

25. How many cards must be chosen from a deck to guarantee that at least
- two aces of two kinds are chosen.
  - two aces are chosen.
  - two cards of the same kind are chosen.
  - two cards of two different kinds are chosen.

- 50, 50, 14, 5
- 51, 51, 15, 7
- 52, 52, 14, 5
- 51, 51, 14, 5

26. Match the following with respect to the mobile computing technologies:

List – I List – II

List – I	List – II
a. GPRS	i. An integrated digital radio standard
b. GSM	ii. 3G wireless/Mobile technology
c. UMTS	iii. Nine different schemes for modulation and error correction
d. EDGE	iv. An emerging wireless service that offers a mobile data

Codes:

- | a       | b   | c  | d   |
|---------|-----|----|-----|
| (A) iii | iv  | ii | i   |
| (B) iv  | i   | ii | iii |
| (C) ii  | iii | iv | i   |
| (D) ii  | i   | iv | iii |

27. Object Request Broker (ORB) is

- A software program that runs on the client as well as on the application server.
  - A software program that runs on the client side only.
  - A software program that runs on the application server, where most of the components reside.
- I, II & III
  - I & II
  - II & III
  - I only

28. A software agent is defined as

- A software developed for accomplishing a given task.
  - A computer program which is capable of acting on behalf of the user in order to accomplish a given computational task.
  - An open source software for accomplishing a given task.
- I
  - II
  - III
  - All of the above

29. Match the following:

List – I	List – II
a. Classification	i. Principal component analysis
b. Clustering	ii. Branch and Bound
c. Feature Extraction	iii. K-nearest neighbour
d. Feature Selection	iv. K-means

**Codes:**

a	b	c	d
(A) iii	iv	ii	i
(B) iv	iii	i	ii
(C) iii	iv	i	ii
(D) iv	iii	ii	i

**30. SET, an open encryption and security specification model that is designed for protecting credit card transactions on the internet, stands for**

- (A) Secure Electronic Transaction
- (B) Secular Enterprise for Transaction
- (C) Security Electronic Transmission
- (D) Secured Electronic Termination

**31. In a paged memory management algorithm, the hit ratio is 70%. If it takes 30 nanoseconds to search Translation Look-aside Buffer (TLB) and 100 nanoseconds (ns) to access memory, the effective memory access time is**

- |            |            |
|------------|------------|
| (A) 91 ns  | (B) 69 ns  |
| (C) 200 ns | (D) 160 ns |

**32. Match the following:**

List – I	List – II
a. Multilevel feedback queue	i. Time-slicing
b. FCFS	ii. Criteria to move processes between queues
c. Shortest process next	iii. Batch processing
d. Round robin scheduling	iv. Exponential smoothening

**Codes:**

a	b	c	d
(A) i	iii	ii	iv
(B) iv	iii	ii	i
(C) iii	i	iv	i
(D) ii	iii	iv	i

**33. Consider a system with five processes  $P_0$  through  $P_4$  and three resource types  $R_1$ ,  $R_2$  and  $R_3$ . Resource type  $R_1$  has 10 instances,  $R_2$  has 5 instances and  $R_3$  has 7 instances. Suppose that at time  $T_0$ , the following snapshot of the system has been taken:**

**Allocation**

	$R_1$	$R_2$	$R_3$
$P_0$	0	1	0
$P_1$	2	0	0
$P_2$	3	0	2
$P_3$	2	1	1
$P_4$	0	2	2

**Max**

$R_1$	$R_2$	$R_3$
7	5	3
3	2	2
9	0	2
2	2	2
4	3	3

**Available**

$R_1$	$R_2$	$R_3$
3	3	2

Assume that now the process  $P_1$  requests one additional instance of type  $R_1$  and two instances of resource type  $R_3$ . The state resulting after this allocation will be

- (A) Ready state
- (B) Safe state
- (C) Blocked state
- (D) Unsafe state

**34. Match the following:**

List – I	List – II
a. Contiguous allocation	i. This scheme supports very large file sizes.
b. Linked allocation	ii. This allocation technique supports only sequential files.
c. Indexed allocation	iii. Number of disks required to access file is minimal.
d. Multi-level indexed	iv. This technique suffers from maximum wastage of space in storing pointers.

**Codes:**

a	b	c	d
(A) iii	iv	ii	i
(B) iii	ii	iv	i
(C) i	ii	iv	iii
(D) i	iv	ii	iii

**35. Which of the following commands will output “onetwothree”?**

- (A) for val; do echo-n \$val; done < one two three
- (B) for one two three; do echo-n; done
- (C) for n in one two three; do echo-n \$n; done
- (D) for n in one two three {echo -n \$ n}

**36. Mergesort makes two recursive calls. Which statement is true after these two recursive calls finish, but before the merge step?**

- (A) The array elements form a heap.
- (B) Elements in each half of the array are sorted amongst themselves.
- (C) Elements in the first half of the array are less than or equal to elements in second half of the array.
- (D) All of the above

- 37.** A text is made up of the characters  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$  and  $\sigma$  with the probability 0.12, 0.40, 0.15, 0.08 and 0.25 respectively. The optimal coding technique will have the average length of  
 (A) 1.7  
 (B) 2.15  
 (C) 3.4  
 (D) 3.8
- 38.** Searching for an element in the hash table requires  $O(1)$  time for the \_\_\_\_\_ time, whereas for direct addressing it holds for the \_\_\_\_\_ time.  
 (A) worst-case, average  
 (B) worst-case, worst-case  
 (C) average, worst-case  
 (D) best, average
- 39.** An algorithm is made up of 2 modules  $M_1$  and  $M_2$ . If time complexity of modules  $M_1$  and  $M_2$  are  $h(n)$  and  $g(n)$  respectively, the time complexity of the algorithm is  
 (A)  $\min(h(n), g(n))$   
 (B)  $\max(h(n), g(n))$   
 (C)  $h(n) + g(n)$   
 (D)  $h(n) * g(n)$
- 40.** What is the maximum number of parenthesis that will appear on the stack at any one time for parenthesis expression given by  
 (( ) ( )) ( ( ))  
 (A) 2  
 (B) 3  
 (C) 4  
 (D) 5
- 41. Match the following:**
- | List – I                   | List – II  |
|----------------------------|--|
| a. Automatic storage class | i. Scope of the variable is global.  |
| b. Register storage class  | ii. Value of the variable persists between different function calls.                 |
| c. Static storage class    | iii. Value stored in memory and local to the block in which the variable is defined. |
| d. External storage class  | iv. Value stored in CPU registers.   |
- Code:**
- | a       | b   | c  | d  |
|---------|-----|----|----|
| (A) iii | iv  | i  | ii |
| (B) iii | iv  | ii | i  |
| (C) iv  | iii | ii | i  |
| (D) iv  | iii | i  | ii |
- 42.** When we pass an array as an argument to a function, what actually gets passed?  
 (A) Address of the array  
 (B) Values of the elements of the array  
 (C) Base address of the array  
 (D) Number of elements of the array
- 43.** While (87) printf("computer"); The above C statement will  
 (A) print "computer" 87 times  
 (B) print "computer" 0 times  
 (C) print "computer" 1 times  
 (D) print "computer" infinite times
- 44.** A friend function can be used to  
 (A) avoid arguments between classes.  
 (B) allow access to classes whose source code is unavailable.  
 (C) allow one class to access an unrelated class.  
 (D) None of the above
- 45.** Which of the following is the correct value returned to the operating system upon the successful completion of a program?  
 (A) 0  
 (B) 1  
 (C) -1  
 (D) Program do not return a value.
- 46.** Manager's salary details are hidden from the employee. This is called as  
 (A) Conceptual level data hiding  
 (B) Physical level data hiding  
 (C) External level data hiding  
 (D) Local level data hiding
- 47.** Which of the following statements is false?  
 (A) Any relation with two attributes is in BCNF.  
 (B) A relation in which every key has only one attribute is in 2NF.  
 (C) A prime attribute can be transitively dependent on a key in 3NF relation.  
 (D) A prime attribute can be transitively dependent on a key in BCNF relation.
- 48.** A clustering index is created when \_\_\_\_\_.  
 (A) primary key is declared and ordered  
 (B) no key ordered  
 (C) foreign key ordered  
 (D) there is no key and no order

49. 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) AC

50. Match the following:

List – I	List – II		
a. DDL	i.	LOCK TABLE	
b. DML	ii.	COMMIT	
c. TCL	iii.	Natural Difference	
d. BINARY Operation	iv.	REVOKE	

Codes:

a	b	c	d
(A) ii	i	iii	iv
(B) i	ii	iv	iii
(C) iii	ii	i	iv
(D) iv	i	ii	iii

**CSIR UGC NET - COMPUTER SCIENCE & APPLICATIONS JUNE 2014 – PAPER II**

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**Answer Key**

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<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
C	C	B	D	C	B	B	B	A	C
<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
A	B	A	D	B	A	B	D	D	B
<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>
A	B	D	C	A	A	B	C	A	B
<b>31</b>	<b>32</b>	<b>33</b>	<b>34</b>	<b>35</b>	<b>36</b>	<b>37</b>	<b>38</b>	<b>39</b>	<b>40</b>
A	B	A	C	A	A	C	C	D	B
<b>41</b>	<b>42</b>	<b>43</b>	<b>44</b>	<b>45</b>	<b>46</b>	<b>47</b>	<b>48</b>	<b>49</b>	<b>50</b>
A	D	C	A	A	B	D	B	B	A



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