Subject Code : 7210/TFU-COMPSC/GLE-II

Question Booklet No. 552115

परीक्षा केन्द्राध्यक्ष की मोहर Seal of Superintendent of Examination Centre	परीक्षार्थी द्वारा बॉल-प्वाइण्ट पेन से भरा जाए To be filled in by Candidate by Ball-Point pen only अनुक्रमांक Roll No.	उत्तर-शीट का क्रमांक Sl. No. of Answer-Sheet
C.G. SET- 2017 Paper-II nputer Sciences and Applications	**घोषणा : मैंने नीचे दिये गये निर्देश अच्छी तरह पढ़कर समझ लिए हैं।** **Declaration : I have read and understood the instructions given below.**	
वीक्षक के हस्ताक्षर (Signature of Invigilator)..... वीक्षक के नाम (Name of Invigilator)	अभ्यर्थी के हस्ताक्षर (Signature of Candidate)..... अभ्यर्थी का नाम (Name of Candidate)	

Paper : II **Subject :** **COMPUTER SCIENCE AND APPLICATIONS** **Time : 1 Hour 15 Minutes** **Maximum Marks : 100**

इस प्रश्न-पुस्तिका में पृष्ठों की संख्या Number of Pages in this Question Booklet	**16**	इस प्रश्न-पुस्तिका में प्रश्नों की संख्या Number of Questions in this Question Booklet	**50**

INSTRUCTION TO CANDIDATES

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

   Example : (A) ● (C) (D) **If (B) is correct answer.**
6. There are **50** objective type questions in this Booklet. All questions are compulsory and carry **2** marks each.
7. Do not write anything anywhere in the Question Booklet or on the Answer-Sheet except making entries in the specified places. Rough work is to be done in the space provided in this booklet.
8. When the examination is over, original OMR Answer Sheet is to be handed over to the invigilator before leaving the examination hall, while the Question Booklet and carbon copy of the Answer-Sheet can be retained by the candidate.
9. There is no negative marks for incorrect answer.
10. Use of any calculator/log table/mobile phone is prohibited.

अभ्यर्थियों के लिए निर्देश

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

   उदाहरण : (A) ● (C) (D) **यदि (B) उत्तर सही है।**
6. प्रश्न-पुस्तिका में 50 वस्तुनिष्ठ प्रश्न दिए गए हैं। प्रत्येक प्रश्न के लिए 2 अंक निर्धारित है। सभी प्रश्न अनिवार्य है।
7. प्रश्न-पुस्तिका तथा उत्तर-शीट में निर्दिष्ट स्थानों पर प्रविष्टियां भरने के अतिरिक्त कहीं भी कुछ न लिखें। रफ कार्य, इस पुस्तिका में उपलब्ध स्थान पर करें।
8. परीक्षा समाप्ति के उपरान्त तथा कक्ष छोड़ने के पूर्व मूल ओ.एम.आर. उत्तर-शीट वीक्षक को सौंपा जाए। प्रश्न-पुस्तिका एवं उत्तर-शीट की कार्बन कॉपी परीक्षार्थी अपने साथ ले जा सकते हैं।
9. ऋणात्मक मूल्यांकन नहीं किया जावेगा।
10. किसी भी तरह के कैलकुलेटर/लॉग टेबल/मोबाइल फोन का प्रयोग वर्जित है।

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

COMPUTER SCIENCE AND APPLICATIONS - II

1. Three boys and four girls have to sit in a row with all arrangements are equally likely. What is the probability that no two boys will sit next to each other ?

(A) $1/7$

(B) $2/7$

(C) $3/7$

(D) $4/7$

2. If $f(x) = 3x^2 + x^3 \log x$ then $f(x)$ is :

(A) O (x^2)

(B) O (x^3)

(C) O (x)

(D) O (1)

3. A set X is called _____ if it is either empty or there exists a positive integer n and some bijection from (1, _ _ _ _ _ _, n) to X.

(A) Infinite

(B) Finite

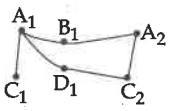
(C) Unlimited

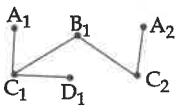
(D) Not complete

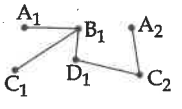
4. A rural college invites four distinguished professors A, B, C, D from a city to give regular, contributory lectures on certain days of the week as shown in the following table :

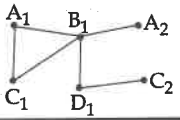
Day / Prof	S	M	T	W	Th	F	Sa
A	X	X	X		X	X	
B			X	X	X		
C		X				X	X
D	X						X

The college wishes to accommodate them in single room in a hotel on the days of their lectures. Although the same professor may be accommodated in different rooms on different visits, he is too dignified to be asked to change his room during a continuous period of stay. Moreover, every professor insist upon knowing in advance which room he has to go to depending on the day of his arrival. Design a weekly schedule of allotments of the rooms to the professors, using as few rooms as possible : which of the following graph is correct solution for this problem :

(A) 

(B) 

(C) 

(D) 

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

5. Consider the following two statements :

S1 : $\{O^{2n} \mid n \geq 1\}$ is a regular language

S2 : $\{O^m 1^n O^{m+n} \mid m \geq 1 \text{ and } n \geq 1\}$ is a regular language. Which of the following is correct ?

(A) Only S1 is correct

(B) Only S2 is correct

(C) Both S1 and S2 are correct

(D) None of S1 and S2 are correct

6. If P, Q, R are three predicates then $7P \wedge 7Q \wedge R$ is a min term of _____.

(A) $P \vee Q$

(B) $P \wedge R$

(C) $7P \wedge 7Q \wedge R$

(D) $P \wedge Q \wedge R$

7. For high speed operations which of the following logic families are well suited ?

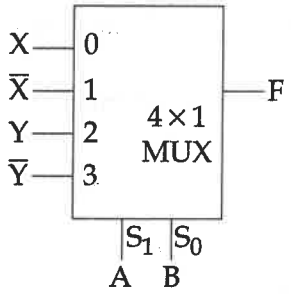
(A) CMOS

(B) MOS

(C) ECL

(D) TTL

8. The output of the following Multiplexer is :



(A) $\overline{A}(\overline{B}X + B\overline{X}) + A(\overline{B}Y + B\overline{Y})$

(B) $X\overline{X} + Y\overline{Y} + AB$

(C) $AX\overline{Y} + BY\overline{X} + AB$

(D) None of above

9. Consider the following statements :

P1 : $((A \leftrightarrow B) \wedge C) \equiv ((A \cap C) \leftrightarrow (B \cap C))$

P2 : $((A \leftrightarrow B) \vee C) \equiv ((A \cup C) \leftrightarrow (B \cup C))$

Which of the following is true ?

(A) P1 is valid but not P2

(B) P2 is valid but not P1

(C) P1 and P2 are valid

(D) P1 and P2 are both not valid

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

10. Let $k = 2^n$. A circuit is built by giving the output of an n - bit binary counter as input to an n to 2^n bit decoder. The composite circuit is equivalent to :

(A) k - bit binary up counter

(B) k - bit binary down counter

(C) k - bit ring counter

(D) k - bit Johnson counter

11. The output of the following program is :

```
int main ()
{
int int_array [ ] = { 31, 54, 77, 52, 93};
int * ptrint;
ptrint = int_array;
for (int J = 0 ; J < 5 ; J++)
cout << * (ptrint ++) << end l;
return 0;
}
```

(A) 52

(B) 54

(C) 62

(D) 77

12. What will be the output of following program ?

```
# include < stdio. h >
int main ()
{
    int x ;
    x = 5 ;
    x = 10 ;
    printf("++x = %d \n", x++);
    return 0 ;
}
```

(A) 10

(B) 5

(C) 11

(D) 6

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

13. What is a statement in C++ language to declare f as a function taking an argument of type int and returning a Floating point number ?

(A) int float (f)

(B) int f(float)

(C) float f(int)

(D) float int(f)

14. What is the output of following code ?

```
# include < stdio.h >

main ()

    {

        int ii = 5 ;

        printf#("%d", ++ii++) ;

    }
```

(A) Runtime Error

(B) Compiler Error

(C) 7

(D) 8

15. A student writes the following code to print integer from 0 to 9. What will happen when the code runs ?

```
# include < stdio.h >

# include < conio.h >

void main ()

{

    Static int i;

    Clrscr();

    for(i=0 ; i <=9;) ;

    {

    printf ("\n value is % d", i) ;

    i++;

    }

    getch() ;

}
```

(A) 0 to 9 will be printed

(B) compiler error will occur

(C) program will enter into infinite loop

(D) only 0 will be printed

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

16. What is the main focus of the data flow model for a database application ?

(A) specifies decision and control information

(B) processing requirements and flow of data

(C) process data semantics and control information

(D) process data, data - semantics and integrity constraints

17. In a database file structure, the search key is 9 bytes long, the block size is 512 bytes, a record pointer is 7 bytes and a block pointer is 6 bytes long. The largest possible order of a non leaf node in a B^+ tree implementing this data structure will be :

(A) 23

(B) 24

(C) 34

(D) 44

18. Which language of DBMS was originally developed at IBM in the SEQUEL - XRM and System-R project during 1974 - 1977 ?

(A) SQL

(B) OOPS C++

(C) PERL

(D) MATLAB

19. Given a relation schema, we need to decide whether it is a good design or we need to decompose it into smaller relations, such a design must be guided by an understanding of what problems, if any, arise from the current schema, to provide such guidance which form is used in DBMS :

(A) DFD

(B) Normal Form

(C) Data Dictionary

(D) Flow Chart

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

20. Which of the following statements are TRUE about an SQL query ?

P : An SQL query can contain a 'HAVING' clause even it does not have a 'GROUP BY' clause

Q : An SQL query can contain a 'HAVING' clause only if it has 'GROUP BY' clause

R : All attributes used in the 'GROUP BY' clause must appear in the 'SELECT' clause

S : Not all attributes used in the 'GROUP BY' clause need to appear in the 'SELECT' clause

Codes :

(A) P and R

(B) P and S

(C) Q and R

(D) Q and S

21. For Breadth first traversal on a graph, which one of the following data structure is used ?

(A) Stack

(B) Queue

(C) Tree

(D) Array

22. A _____ tree of a graph is just a subgraph that contains all the vertices and is a tree.

(A) Binary

(B) Balanced

(C) Spanning

(D) Complete

23. Matrices with relatively high proportion of zero entries are called _____ matrices.

(A) Sparse

(B) Singular

(C) Diagonal

(D) Triangular

24. Which data is used to implement recursion ?

(A) Array

(B) Stack

(C) Queue

(D) Linked List

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

25. Which of the following uses overflow of pages ?

(A) B^+ tree

(B) B tree

(C) AVL tree

(D) None of the above

26. The mask and destination address both are 0.0.0.0 in routing table, if _____ forwarding is used.

(A) Next hop

(B) Network specific

(C) Host specific

(D) Default

27. The characteristic of the client-server architecture is that the server has a fixed, well known address called :

(A) IP address

(B) I - Net address

(C) Server

(D) Client

28. Match the layer :

(a)	Data link Layer	(i)	The lowest layer whose function is to activate, deactivate and maintain the circuit between DTE and DCE
(b)	Physical Layer	(ii)	Perform routing and communication
(c)	Presentation Layer	(iii)	Detection and recovery from errors in the transmitted data
(d)	Network Layer	(iv)	Provides for the syntax of data

Codes :

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

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

29. The lookup page table shown below is for a job in page virtual storage system with page size of 1024 locations. Each virtual address is in the form [p, d] where p and d are the page number and displacement in that page respectively.

Virtual page	Actual page
0	3
1	??
2	4

The virtual address of (0, 514) maps to an actual address :

(A) 514

(B) 1024

(C) 3586

(D) 4514

30. Thrashing in virtual memory environment can be avoided if :

(A) The speed of CPU is increased to some threshold

(B) Appointing skilled programmer to take care

(C) All the pages belonging to the working set of the program must be in main memory

(D) Increasing the speed of data transfer between main memory and virtual memory

31. Peep - hole optimization is a compiler optimization used for :

(A) Replacement of faster sets of instructions using the constant folding technique

(B) Optimization Technique used by applying code motion

(C) Optimization Technique used by applying dead code elimination

(D) Optimizes code by strength reduction

32. Which is correct well - formed formula for following truth table :

P	Q	$P \vee Q$	$P \Rightarrow Q$	$(P \vee Q) \wedge (P \Rightarrow Q)$	$(Q \Rightarrow P)$	α
T	T	T	T	T	T	T
T	F	T	F	F	T	F
F	T	T	T	T	F	F
F	F	F	T	F	T	F

(A) $\alpha = (P \vee Q) \wedge (P \Rightarrow Q) \wedge (Q \Rightarrow P)$

(B) $\alpha = (P \wedge Q) \vee (P \Rightarrow Q) \vee (Q \Rightarrow P)$

(C) $\alpha = (P \vee Q) \vee (P \Rightarrow Q) \wedge (Q \Rightarrow P)$

(D) $\alpha = (P \wedge Q) \wedge (P \Rightarrow Q) \vee (Q \Rightarrow P)$

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

33. Analytically a finite automaton can be represented by :

(A) (Σ, Z, Y, δ F)

(B) (B, A, C, D, F)

(C) (Q, Σ, δ , q_0, F)

(D) (Q, A, F, δ , q)

34. Symbol table can be used for :

(A) Checking type compatibility

(B) Supressing duplicate error message

(C) Storage allocation

(D) All of (A), (B) and (C)

35. The compiler determines the type used in a template function via,

(A) The name of the function

(B) The first variable declared within the function

(C) The type of argument passed to the function

(D) The type of the value turned from the function

36. Aging is a technique used for :

(A) Memory Management

(B) Resolve problems in same scheduling system

(C) Dead lock prevention problems

(D) Dead lock avoidance algorithm

37. Virtual Memory is _____.

(A) The concept used for copying a process from secondary to main memory

(B) The memory used for sharing among processes

(C) The pager concerns with individual page of a process

(D) The pager concerns with first page of a process

38. In Unix, wtmp and utmp file contains :

(A) Temporary system data

(B) User login - logout data

(C) The user's command execution log

(D) The user's personal data

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

39. Consider the following set of processes that arrive at time 0, with the length of the CPU burst time is given in milliseconds :

Process	Burst Time
P1	24
P2	3
P3	3

If the processes arrive in the order P2, P3, P1 then, what is average waiting time ?

(A) 3 milliseconds

(B) 17 milliseconds

(C) 4 milliseconds

(D) 18 milliseconds

40. Performance of RR algorithm depends heavily on :

(A) Size of process

(B) I/O bursts of process

(C) CPU bursts

(D) Size of time quantum

41. Coupling and cohesion are used in which phases of S.D.L.C.

(A) Requirement Analysis

(B) System Design

(C) Validation and verification

(D) Software Maintenance

42. Which of the following would not be a major deliverable of the structured system analysis phase ?

(A) E - R diagram

(B) DFD

(C) Data dictionary

(D) Prototype model

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

43. Which of the following model is an incremental model ?

(A) Prototype model

(B) Waterfall model

(C) Spiral model

(D) Iterative waterfall model

44. In spiral model risk analysis is performed :

(A) In the first loop

(B) In the first and second loop

(C) In every loop

(D) At last

45. In software engineering a typical estimation model is derived using regression analysis on data collected from post software projects by the form :

(A) $E = A * B + e_v c$

(B) $E = A/B * (e_v)^c$

(C) $E = A + B * (e_v)^c$

(D) $E = A + B/(e_v)^c$

46. Similarity is a measure used in _____ data mining Algorithm.

(A) Classification Algorithm

(B) Decision tree Algorithm

(C) Clusterins Algorithms

(D) Apriori Algorithm

47. Intelligent Agents senses through _____ and takes action through _____.

(A) Sensors, actuators

(B) Remote, Signal

(C) Both (A) and (B)

(D) None of the above

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

48. In tightly coupled system the processors :

(A) Share a common clock

(B) Share a common memory

(C) Share a common clock or common memory

(D) Share a common clock and common memory

49. A terminal multiplexer has 5 number of 1200 bps terminal and 'n' number of 300 bps terminals connected to it. The outgoing line is of 9600 bps. What is the maximum value of n ?

(A) 16

(B) 8

(C) 12

(D) 4

50. In a paged memory, the page hit ratio is 0.35, the time required to access a page in secondary memory is equal to 100 nsec. The time required to access a page in primary memory is 10 nsec. The average time required to access a page is :

(A) 3.0 nsec

(B) 68.0 nsec

(C) 68.5 nsec

(D) 78.5 nsec

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SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

SPACE FOR ROUGH WORK / रफ कार्य के लिये जगह

उत्तर अंकित करने का समय : 1 घंटा 15 मिनिट
Time for marking answers : 1 Hour 15 Minutes

अधिकतम अंक : 100
Maximum Marks : 100

नोट :

1. इस प्रश्न-पुस्तिका में 50 प्रश्न है - प्रत्येक प्रश्न 2 अंक का है। सभी प्रश्न हल करना अनिवार्य है।

2. प्रश्नों के उत्तर, दी गई OMR उत्तर-शीट (आंसर-शीट) पर अंकित कीजिए।

3. ऋणात्मक मूल्यांकन नहीं किया जावेगा।

4. किसी भी तरह के कैलकुलेटर या लॉग टेबल एवं मोबाइल फोन का प्रयोग वर्जित है।

5. OMR उत्तर-शीट (आंसर-शीट) का प्रयोग करते समय ऐसी कोई असावधानी न करें/बरतें जिससे यह फट जाये या उसमें मोड़ या सिलवट आदि पड़ जाये जिसके फलस्वरूप वह खराब हो जाये।

Note :

1. This Question Booklet contains 50 questions. Each question carries 2 marks. Answer all questions.

2. Indicate your answers on the OMR Answer-Sheet provided.

3. No negative marking will be done.

4. Use of any type of calculator or log table and mobile phone is prohibited.

5. While using OMR Answer-Sheet care should be taken so that the Answer-Sheet does not get torn or spoiled due to folds and wrinkles.

SEAL