POST GRADUATE COMMON ENTRANCE TEST-2019

DATE and TIME	COURSE	SUBJECT
20-07-2019 2.30 p.m. to 4.30 p.m.	ME/M.Tech/M.Arch/ courses offered by VTU/UVCE/UBDTCE	COMPUTER SCIENCE ENGINEERING

MAXIMUM MARKS	TOTAL DURATION	MAXIMUM TIME FOR ANSWERING
100	150 Minutes	120 Minutes

MENTION YOUR PGCET NO.					QUESTION BOOKLET DETAILS	
					VERSION CODE	SERIAL NUMBER
					E	116541

DOs :

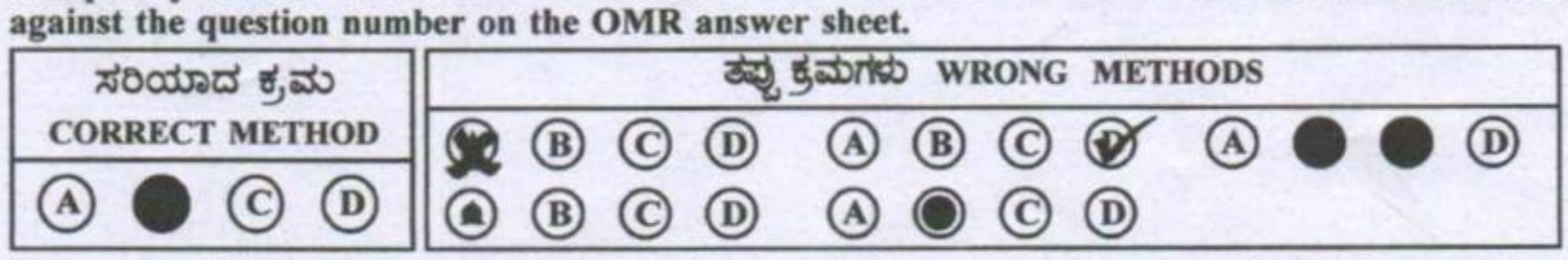
1. Candidate must verify that the PGCET number & Name printed on the OMR Answer Sheet is tallying with the PGCET number and Name printed on the Admission Ticket. Discrepancy if any, report to invigilator.
2. This question booklet is issued to you by the invigilator after the **2nd bell i.e., after 2.25 p.m.**
3. The Version Code of this Question Booklet should be entered on the OMR Answer Sheet and the respective circle should also be shaded completely.
4. The Version Code and Serial Number of this question booklet should be entered on the Nominal Roll without any mistakes.
5. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DON'Ts :

1. **The timing and marks printed on the OMR answer sheet should not be damaged / mutilated / spoiled.**
2. The **3rd Bell rings at 2.30 p.m., till then;**
   - Do not remove the paper seal / polythene bag present on the right hand side of this question booklet.
   - Do not look inside this question booklet.
   - Do not start answering on the OMR answer sheet.

IMPORTANT INSTRUCTIONS TO CANDIDATES

1. This question booklet contains 75 (items) questions and each question will have one statement and four answers. (Four different options / responses.)
2. After the **3rd Bell is rung at 2.30 p.m.,** remove the paper seal / polythene bag on the right hand side of this question booklet and check that this booklet does not have any unprinted or torn or missing pages or items etc., if so, get it replaced by a complete test booklet. Read each item and start answering on the OMR answer sheet.
3. During the subsequent 120 minutes:
   - Read each question (item) carefully.
   - Choose one correct answer from out of the four available responses (options / choices) given under each question / item. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose **only one response** for each item.
   - **Completely darken / shade the relevant circle with a BLUE OR BLACK INK BALL POINT PEN against the question number on the OMR answer sheet.**



4. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
5. After the **last Bell is rung at 4.30 p.m.,** stop marking on the OMR answer sheet and affix your **left hand thumb impression** on the OMR answer sheet as per the instructions.
6. Handover the **OMR ANSWER SHEET** to the room invigilator as it is.
7. After separating the top sheet (KEA copy), the invigilator will return the bottom sheet replica (Candidate's copy) to you to carry home for self-evaluation.
8. Preserve the replica of the OMR answer sheet for a minimum period of **ONE year**.
9. Only **Non-programmable** calculators are allowed.

Marks Distribution

PART-1 : 50 QUESTIONS CARRY ONE MARK EACH (1 TO 50)
PART-2 : 25 QUESTIONS CARRY TWO MARKS EACH (51 TO 75)

CSE - E

COMPUTER SCIENCE & ENGINEERING

PART – 1

Each question carries one mark. **(50 × 1 = 50)**

1. The diagramming language suitable for object-oriented paradigm is
   (A) Data Flow Diagramming Language
   (B) Entity-Relationship Language
   (C) Object-Oriented Language
   (D) Unified Modeling Language

2. Couple of the good database design principles suggest that preservation and minimization of functional dependencies. These issues can be resolved by
   (A) Eliminating transitive functional dependencies
   (B) Eliminating all interrelationship between all attributes
   (C) Minimizing candidate keys
   (D) None of these

3. The normalization is a way to implement
   (A) Good software engineering principles
   (B) Good database design principles
   (C) Structured Query Language
   (D) Database Schema

4. Object-oriented paradigm is used in the analysis stage of SDLC to
   (A) Structure the behavioural part of the business process
   (B) Design the structural part of Computer memory
   (C) Design the object-oriented programming language
   (D) Design the structure of the database.

5. The signature of the object method clause present in class diagram contains
   (A) All definitional attributes of the class used in the method
   (B) All referential attributes of the class/es used in the method
   (C) All definitional attributes of related classes
   (D) All attributes of related classes

6. The Software Development Life Cycle (SDLC) is used in all
   (A) Process models
   (B) Design models
   (C) Programming models
   (D) None of these

Space For Rough Work

7. The success rate of the software development is pathetically low because
   (A) Most of the techniques are human skill dependent guidelines.
   (B) The development methodology is not using object-oriented technology.
   (C) Design of software comprises interrelated cluster of software.
   (D) Inconsistency in the values of related data.

8. The Ford-Fulkerson method of finding maximum flow from source to sink is
   (A) An iterative method
   (B) A recursive method
   (C) A direct determination method
   (D) A methodology of linked methods

9. The complexity of algorithms is comparatively more accurate in the use of
   (A) Asymptotic analysis
   (B) Amortized analysis
   (C) Both of these
   (D) Not dependent on the nature of analysis.

10. The matrices represented for transformations in homogeneous co-ordinate system are used to transform
   (A) Multiplication into addition
   (B) Addition into multiplication
   (C) Division into subtraction
   (D) Subtraction into division

11. The good software engineering principles are used in object-oriented paradigm to
   (A) Streamline the structural part of the business process
   (B) Streamline the security of the business process
   (C) Streamline the structure of the class
   (D) Streamline the object methods of the class

12. The picture definition, stored in the 24 frame buffers of which each 8 frame buffers are reserved for the primary colours viz., red, blue & green displays the picture in
   (A) 67,77,216
   (B) 77,216
   (C) 1,67,77,216
   (D) 3

13. In the parallel projection, the picture definition of the window to the view port, the parallel projection lines are
   (A) Parallel to the viewport
   (B) Perpendicular to the viewport
   (C) Parallel to the window
   (D) Perpendicular to the window

Space For Rough Work

14. In isometric projection of picture definition, the object is projected on the screen which cuts the x-, y- & z-coordinate axes at
(A) Equidistance from the origin
(B) Any distance from the origin
(C) Equidistance from the screen
(D) Any distance from the screen

15. The scaling transformation of the object with uniform scaling factors greater than 1,
(A) Retains the size and shape of the object
(B) Retains only the size of the object
(C) Changes only the shape of the object
(D) Enhances the size of the object retaining the shape

16. The scaling factors equals to 2 in any direction
(A) Retains the distance of the defining point of the object from the origin, but doubles the size of the object in that direction
(B) Doubles the distance of the defining point of the object from the origin, but retains the size of the object in that direction
(C) Retains both the distance of the defining point of the object from the origin and also the size of the object in that direction
(D) Doubles both the distance of the defining point of the object from the origin and the size of the object in that direction

17. The normals to the plane surface $ax + by + cz + d = 0$ is represented by
(A) $ai + bj + ck$
(B) $ai + bj + dk$
(C) $ai + cj + dk$
(D) $bi + cj + dk$
where (i, j, k) are unit normal respectively along x-, y-, and z- directions.

18. The transitive dependencies between attributes of a relation (relational DBMS file) is eliminated by the application of
(A) 1st normal form
(B) 2nd normal form
(C) 3rd normal form
(D) 4th normal form
rule on the relation.

19. The concatenation of three or more matrices is
(A) Associative and also commutative
(B) Associative but not commutative
(C) Commutative but not associative
(D) Neither associative nor commutative

20. The normalization of relations in DBMS is based on
(A) Divide and conquer algorithm
(B) Axioms of probability
(C) Greedy algorithm
(D) Armstrong's axioms

Space For Rough Work

21. The undesirable multivalued dependency in a relation arises if there exist

(A) Two one-to-many relationships between attributes of a relation

(B) One one-to-one and one one-to-many relationships between attributes within a relation

(C) Two one-to-one relationships between attributes of a relation

(D) One one-to-many relationship between attributes across relations

22. The software is developed using one of the process models, whose stages are iterative in nature because

(A) Their pedestal software development life cycle needs iteration.

(B) The activities in software developmental stages are human skill dependent.

(C) The involved automated activities need iterations.

(D) None of these

23. The running time of amortized stack of n elements is

(A) Push = 2, pop = 0, Make Empty = 0

(B) Push = 1, pop = 1, Make Empty = n

(C) Push = 1 or n, pop = 1 or (n – 1), Make Empty = 1

(D) Push = 3, pop = 2, Make Empty = 1

24. The tower of Hanoi puzzle with n (n > 1) different dimensional disks stacked on peg A in the decreasing order of their size with largest dimensional disk at the bottom and smallest dimensional disk at the top. The disks are to be transferred from peg A to Peg B using peg C with one disk at a time such that under no circumstance larger disk should be stacked on smaller disk. The total number of disk transfers is given by

(A) $2T(n-1)+2$

(B) $2T(n-1)+1$

(C) $T(n-1)+T(n-2)$

(D) $2T(n)$

25. The running time of an algorithm of n interdependent operations is computed with both the asymptotic & amortized analyses. The most accurate running time is obtained by

(A) Asymptotic analysis

(B) Amortized analysis

(C) Both analyses

(D) None of these

26. In a banking system, where customers transact randomly for the storage & accession of desired data, the most appropriate file for storage of records could be

(A) Sequential file

(B) Indexed sequential file

(C) Hash file

(D) Random file

Space For Rough Work

27. The least running time of creating spanning tree from connected graph G(E, V) is

(A) O (V log V)

(B) O (E + V log V)

(C) O (E log V)

(D) O (V log V + E log V)

Where E, V are respectively number of edges & vertices in the graph.

28. When a programming system and software are developed separately for the same business process, the development cost of

(A) programming system is more than the software.

(B) software is more than the programming system.

(C) Both are the same.

(D) Both cannot be comparable.

29. The iterations of Software Development Stage Activities in different process models are used to

(A) Eliminate errors of previous iterations in the current iteration and also to accommodate the changes in the business process

(B) Only eliminate errors of previous iterations in the current iteration

(C) Only accommodate the change in business process

(D) None of these

30. The average number of accesses to access the desired record stored in a sequential file containing n records is

(A) $(n + 1)/2$

(B) $n/2$

(C) $(n - 1)/2$

(D) n

31. During the implementation stage of Software Development Life Cycle, the following UML diagram is designed to determine the correctness & Completeness of integration of different software

(A) Class diagram

(B) Object diagram

(C) Usecase diagram

(D) Component diagram.

32. In DBMS, the only association would satiate the complete interrelationships set of business processes and in object-oriented paradigm, the inter-relationships are enhanced by additional aggregation & super-sub class hierarchy. This addition is due to the elimination of the following from the object-oriented paradigm

(A) null values only

(B) redundancies only

(C) both null values & redundancies

(D) inconsistencies

Space For Rough Work

33. Relational Algebra is integral part of DBMS because it

(A) contains operators analogous to query language queries.

(B) contains relational operators analogous to query language queries.

(C) is used as intermediate language in translating programming language programs into query language queries.

(D) is used as intermediate language in translating query language queries into programming language programs.

34. The following relational algebra operators form complete set of operators. The other operators can be represented by any combinations of these :

(A) $\{\rho, \sigma, \Pi, -, \cap\}$

(B) $\{\sigma, \div, -, \cup, X\}$

(C) $\{\sigma, \Pi, -, \cup, X\}$

(D) $\{\sigma, \Pi, -, \cap, \div\}$

35. The 'divide' operator in the relational algebra is categorized as

(A) A mathematical operator

(B) A relational operator

(C) A mathematical cum relational operator

(D) Neither relational nor mathematical operator

36. The comparison of algorithm types divide-and-conquer (DAC) and dynamic programming (DP) indicates that

(A) DP is bottom-up approach and DAC is top-down approach.

(B) DP is top-down approach and DAC is bottom-up approach.

(C) Both DP and DAC are bottom-up approaches.

(D) Both DP and DAC are top-down approaches.

37. The distinction between B tree and B^+ tree is that

(A) B tree contains data at all memory locations whereas B^+ tree contains data at leaf level nodes

(B) B^+ tree contains data at all levels and B tree contains data only at the leaf nodes.

(C) Both contain data at all levels.

(D) Both contains data only at leaf nodes.

38. The decomposition of a relation R of relational *DBMS into* two relations R1(X) & R2(Y) is lossless if

(A) $X \cap Y > X - Y$ or $X \cap Y > Y - X$ is in F^+

(B) $X - Y > X \cup Y$ or $Y - X > X \cup Y$ is in F^+

(C) $X \cap Y > X - Y$ and $X \cap Y > Y - X$ are in F^+

(D) $X - Y > X \cup Y$ and $Y - X > X \cup Y$ are in F^+

Here '>' means determines, F^+ is closure of functional dependencies and X, Y are set of attributes present in R1 & R2 respectively.

Space For Rough Work

39. In the transaction management of schedule, the

(A) Conflict serializability implies View serializability

(B) View serializability implies Conflict serializability

(C) Conflict serializability does not implies View serializability

(D) None of these

40. A two level indexed sequential file of size 12,000 records has 20 entries in each index. The average number of accesses required for accessing a desired record is

(A) 6000

(B) 70

(C) 35

(D) 39

41. In a real time system, the time is more important than the quality of

(A) Structure of the system

(B) Function of the system

(C) Cardinality of the file

(D) Functional dependencies of the record

42. The efficacious software testing follows the following principle :

(A) Maximum number of test cases to detect & correct minimum number of errors

(B) Minimum number of test cases to detect & correct minimum number of errors

(C) Maximum number of test cases to detect & correct maximum number of errors

(D) Minimum number of test cases to detect & correct maximum number of errors

43. The communication network comprises number of base stations. The scope of each base station covers the circular area. To avoid the overlapping and gaping of areas, the scope of each base station is accounted by

(A) Rectangle

(B) Pentagon

(C) Hexagon

(D) Octagon

44. In the software testing, the behavioural testing is called

(A) White box testing

(B) Black box testing

(C) Mutation testing

(D) Integration testing

Space For Rough Work

45. The relational DBMS is constructed on relational principles which are based on

(A) The matrix theory

(B) Axiomatic principles

(C) Primary key

(D) Primary & foreign key relationship

46. In relational DBMS, the closure of functional dependencies facilitates

(A) To determine the candidate key

(B) To determine the foreign key

(C) To determine the dependency of an attribute with other attribute/s

(D) None of these

47. The process of normalization is used to

(A) Enhance the number of relations

(B) Determine the relationship between different relations

(C) Minimize the redundancies & eliminate anomalies

(D) Ease the computational work.

48. The schema for the entire database is designed using

(A) Data definitional language

(B) Structured query language

(C) Data manipulation language

(D) Schema structure language

49. The difference between the structured query language and the programming language is that

(A) Structured query language does not contain answer to how ? about computation

(B) Programming language does not contain the answer to how ? About computation

(C) Only structured query language uses strict semiotics

(D) Only programming language uses strict semiotics.

50. One of the differences between Object-Oriented Paradigm (OOP) and Database Management System (DBMS) is that

(A) In DBMS, null values & redundancies are completely eliminated

(B) In OOP, null values & redundancies are completely eliminated

(C) In OOP, only null values are minimized

(D) In DBMS, only null values are eliminated.

Space For Rough Work

PART – 2

Each question carries two marks. **(25 × 2 = 50)**

51. In the software Testing, the white box testing tests _____ part and black box testing tests _____ part of the developed programming system.

(A) structural, behavioural

(B) behavioural, structural

(C) mutational, structural

(D) structural, mutational

52. The signature present in the object method clause of the class diagram contains _____ attributes of the related classes and _____ type.

(A) return, referential

(B) referral, return

(C) referential, return

(D) definitional, used

53. In the 'Analyzing' stage of Software Development Life Cycle (SDLC), _____ defines the entire memory structure and _____ defines the main memory.

(A) schema, paradigm

(B) schema, relation

(C) paradigm, relation

(D) schema, relation structure

54. The Information Technology encompasses the engineering disciplines of _____, _____, _____ and _____.

(A) CSE, ECE, Instrumentation, Telecommunication

(B) ECE, Instrumentation, Telecommunication, Electrical

(C) CSE, ECE, Instrumentation, Electrical

(D) Electrical, CSE, ECE, Telecommunication.

Space For Rough Work

55. A society is called information society if majority of people of all walks of life use _____ for their routine information processing.

(A) calculator

(B) information

(C) computer

(D) television

56. In software engineering, the word paradigm means the operators and _____ are within the system.

(A) variables

(B) operands

(C) constants

(D) transitive verbs

57. The level 0 data flow diagram (context diagram) contains the syntactics viz., _____, _____ and _____ only and not _____.

(A) data stores, processes, data flows and not actors

(B) actors, data flows, processes and not data stores

(C) data stores, processes, actors and not data flows

(D) data stores, actors, data flows and not processes.

58. The conflict serializability can be determined by _____ of the graph containing READs and WRITEs of transactions of a schedule as vertices and READ-WRITE, WRITE-READ and _____ in the time order as edges.

(A) acyclicity, READ-READ

(B) cyclicity, READ-WRITE

(C) cyclicity, WRITE-READ

(D) acyclicity, WRITE-WRITE

59. Agile process model is developed based on _____ (number) principles and one of the most widely used approach is called _____ (XP).

(A) 5, External programming

(B) 6, Extreme programming

(C) 7, External Paradigm

(D) 7, Extreme programming

Space For Rough Work

60. Software maintenance means perennial updation of software to the changing needs of _____ process and advancement in _____.

(A) business, technology

(B) business, business

(C) business, information

(D) technology, business

61. In the Rational Unified Process (RUP), the _____ milestone is reached after completion of elaboration stage.

(A) lifecycle objectives

(B) lifecycle architecture

(C) initial operational capability

(D) life cycle technique

62. The _____ statement in the program, reserves a record length memory for the file with structures defined in the program.

(A) open

(B) close

(C) Read

(D) write

63. The visibility 'protected' is used only with attributes and methods of

(A) subclass

(B) super class

(C) abstract class

(D) base class

64. The running time of using two-way merge-sort technique to sort a file of $n > 1$ records is

(A) $2T(n/2) + \Theta(n)$

(B) $\lg(n) + \Theta(n)$

(C) $\Theta(n)$

(D) $O(n)$

65. The postfix notation for infix notation $a * (b + c) + d \div e$ is given by

(A) a b c * + d e ÷ +

(B) a b c + * d e ÷ +

(C) a b c d e + * ÷ +

(D) a b c * + d e + ÷

Space For Rough Work

66. The infix notation helps _____ to compute and postfix & prefix notations help _____ to compute.

(A) human, algorithm

(B) program, human

(C) human, machine

(D) machine, human

67. A binary tree of height h can have at most minimum of _____ elements where n is the height of the tree.

(A) 2^n

(B) 2^{n+1}

(C) $2^n + 1$

(D) 2^{2n}

68. In the requirements gathering stage of SDLC, the passive (voice) statement are converted into active (voice) statement because

(A) The active statement define an event.

(B) The active statement define an activity.

(C) The active statement refer an event.

(D) The active statement refer an activity.

69. The logical data model of any DBMS is the _____ of the _____ model in terms of the DBMS.

(A) version, conceptual

(B) conceptual, physical

(C) internal, conceptual

(D) version, physical

70. In UML, the number of usecase diagrams commensurate with _____.

(A) number of usecases

(B) number of classes

(C) number of actors

(D) number of object methods

71. Software development planning is designed using

(A) activity diagram

(B) object structure diagram

(C) activity chart

(D) bar chart

Space For Rough Work

72. The multivalued dependencies (MVDs) can be eliminated using _____ normal form on _____ normal form relations.

(A) 1^{st}, 2^{nd}

(B) 2^{nd}, 3^{rd}

(C) 3^{rd}, BCNF

(D) 4^{th}, BCNF

73. The Software Development Life Cycle used in process models for software development will be with meaningful life cycle if between consecutive stages there exist _____.

(A) activities documents

(B) amphisbaena documents

(C) design documents

(D) software

74. In a communicative network, though the scope of base station is circular area, the network scope is represented by _____ shape, as it is nearest to the circular area.

(A) triangular

(B) rectangular

(C) pentagonal

(D) hexagonal.

75. In the software development, the physical architecture is related to the _____ stage/s and logical architecture is related to _____ stage/s.

(A) Implementation & Deployment, Design

(B) Coding & implementation, Design

(C) Design & Implementation, Deployment

(D) Deployment & Implementation, Deployment

Space For Rough Work

Space For Rough Work