SUBJECT CODE	SUBJECT	PAPER
A-04-02	**COMPUTER SCIENCE AND APPLICATIONS**	**II**

HALL TICKET NUMBER

QUESTION BOOKLET NUMBER

OMR SHEET NUMBER

DURATION	MAXIMUM MARKS	NUMBER OF PAGES	NUMBER OF QUESTIONS
1 HOUR 15 MINUTES	**100**	**16**	**50**

This is to certify that, the entries made in the above portion are correctly written and verified.

_____
Candidates Signature

_____
Name and Signature of Invigilator

Instructions for the Candidates

1. Write your Hall Ticket Number in the space provided on the top of this page.
2. This paper consists of fifty multiple-choice type of questions.
3. At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested <u>to open the booklet and compulsorily examine it as below</u> :
   (i) To have access to the Question Booklet, tear off the paper seal on the edge of this cover page. Do not accept a booklet without sticker-seal and do not accept an open booklet.
   (ii) **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 by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.**
   (iii) After this verification is over, the Test Booklet Number should be entered in the OMR Sheet and the OMR Sheet Number should be entered on this Test Booklet.
4. Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.

   Example: (A) (B) ● (D)

   where (C) is the correct response.
5. Your responses to the items are to be indicated in the **OMR Answer Sheet given to you**. If you mark at any place other than in the circle in the Answer Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done in the end of this booklet.
8. If you write your name or put any mark on any part of the OMR Answer Sheet, except for the space allotted for the relevant entries, which may disclose your identity, you will render yourself liable to disqualification.
9. **The candidate must handover the OMR Answer Sheet to the invigilators at the end of the examination compulsorily** and must not carry it with you outside the Examination Hall. The candidate is allowed to take away the carbon copy of OMR Sheet and used Question paper booklet at the end of the examination.
10. **Use only Blue/Black Ball point pen.**
11. **Use of any calculator or log table etc., is prohibited.**
12. **There is no negative marks for incorrect answers.**

అభ్యర్థులకు సూచనలు

1. ఈ పుట పై భాగంలో ఇవ్వబడిన స్థలంలో మీ హాల్ టికెట్ నంబరు రాయండి.
2. ఈ ప్రశ్న పత్రము యాభై బహుళైచ్ఛిక ప్రశ్నలను కలిగి ఉంది.
3. పరీక్ష ప్రారంభమున ఈ ప్రశ్నాపత్రము మీకు ఇవ్వబడుతుంది. మొదటి ఐదు నిమిషములలో ఈ ప్రశ్నాపత్రమును తెరిచి కింద తెలిపిన అంశాలను తప్పనిసరిగా సరిచూసుకోండి.
   (i) ఈ ప్రశ్న పత్రమును చూడడానికి కవర్ పేజి అంచున ఉన్న కాగితపు సీలును చించండి. స్టిక్కర్ సీలులేని మరియు ఇదివరకే తెరిచి ఉన్న ప్రశ్నపత్రమును మీరు అంగీకరించవద్దు.
   (ii) కవర్ పేజి పై ముద్రించిన సమాచారం ప్రకారం ఈ ప్రశ్నపత్రములోని పేజీల సంఖ్యను మరియు ప్రశ్నల సంఖ్యను సరిచూసుకోండి. పేజీల సంఖ్యకు సంబంధించి గాని లేదా సూచించిన సంఖ్యలో ప్రశ్నలు లేకపోవుట లేదా నిజప్రతి కాకపోవుట లేదా ప్రశ్నలు క్రమపద్ధతిలో లేకపోవుట లేదా ఏదైనా తేడాలుండుట వంటి దోషపూరితమైన ప్రశ్న పత్రాన్ని వెంటనే మొదటి ఐదు నిమిషాల్లో పరీక్షా పర్యవేక్షకునికి తిరిగి ఇచ్చివేసి దానికి బదులుగా సరిగ్గా ఉన్న ప్రశ్నపత్రాన్ని తీసుకోండి. తదనంతరం ప్రశ్నపత్రము మార్చబడదు అదనపు సమయం ఇవ్వబడదు.
   (iii) పై విధంగా సరిచూసుకున్న తర్వాత ప్రశ్నాపత్రం సంఖ్యను OMR పత్రము పై అదేవిధంగా OMR పత్రము సంఖ్యను ఈ ప్రశ్నాపత్రము పై నిర్దిష్టస్థలంలో రాయనలెను.
4. ప్రతి ప్రశ్నకు నాలుగు ప్రత్యామ్నాయ ప్రతిస్పందనలు (A), (B), (C) మరియు (D) లుగా ఇవ్వబడ్డాయి. ప్రతిప్రశ్నకు సరైన ప్రతిస్పందనను ఎన్నుకొని కింద తెలిపిన విధంగా OMR పత్రములో ప్రతి ప్రశ్నా సంఖ్యకు ఇవ్వబడిన నాలుగు వృత్తాల్లో సరైన ప్రతిస్పందనను సూచించే వృత్తాన్ని బాల్ పాయింట్ పెన్ తో కింద తెలిపిన విధంగా పూరించాలి.

   ఉదాహరణ : (A) (B) ● (D)

   (C) సరైన ప్రతిస్పందన అయితే
5. ప్రశ్నలకు ప్రతిస్పందనలను ఈ ప్రశ్నపత్రముతో ఇవ్వబడిన OMR పత్రము పైన ఇవ్వబడిన వృత్తాల్లోనే పూరించి గుర్తించాలి. అలాకాక సమాధాన పత్రంపై వేరొక చోట గుర్తిస్తే మీ ప్రతిస్పందన మూల్యాంకనం చేయబడదు.
6. ప్రశ్న పత్రము లోపల ఇచ్చిన సూచనలను జాగ్రత్తగా చదవండి.
7. చిత్తుపనిని ప్రశ్నపత్రము చివర ఇచ్చిన ఖాళీస్థలములలో చేయాలి.
8. OMR పత్రము పై నిర్దేశిత స్థలంలో సూచించవలసిన వివరాలు తప్పించి ఇతర స్థలంలో మీ గుర్తింపును తెలిపే విధంగా మీ పేరు రాయడం గాని లేదా ఇతర చిహ్నాలను పెట్టడం గాని చేసినట్లయితే మీ అనర్హతకు మీరే బాధ్యులవుతారు.
9. పరీక్ష పూర్తయిన తర్వాత మీ OMR పత్రాన్ని తప్పనిసరిగా పరీక్ష పర్యవేక్షకుడికి ఇవ్వాలి. వాటిని పరీక్ష గది బయటకు తీసుకువెళ్లకూడదు. పరీక్ష పూర్తయిన తరువాత అభ్యర్థులు ప్రశ్న పత్రాన్ని, OMR పత్రం యొక్క కార్బన్ కాపీని తీసుకువెళ్లవచ్చు.
10. సీలి/నల్ల రంగు బాల్ పాయింట్ పెన్ మాత్రమే ఉపయోగించాలి.
11. లాగరిథమ్ టేబుల్స్, క్యాలిక్యులేటర్లు, ఎలక్ట్రానిక్ పరికరాలు మొదలగునవి పరీక్షగదిలో ఉపయోగించడం నిషేధం.
12. తప్పు సమాధానాలకు మార్కుల తగ్గింపు లేదు.

1. The number of anti-symmetric relations on a set A with k elements is

    (A) $2^{k*\,(3k-1)/2}$

    (B) 2^k

    (C) k^2

    (D) k

2. How many vertices does a regular graph of degree 4 with 10 edges have?

    (A) 3   (B) 16

    (C) 4   (D) 5

3. Consider the following Statements :

    I. Every group of prime order is cyclic

    II. A cyclic group of prime order p has p-1 generators.

    Which of the following is true ?

    (A) Statement I is correct and Statement II is incorrect

    (B) Statement I is incorrect and Statement II is correct

    (C) Both the Statements I and II are correct

    (D) Both the Statements I and II are incorrect

4. How many derangements are there of a set with seven elements ?

    (A) 3708

    (B) 1854

    (C) 1856

    (D) 5040

5. Which of the following Boolean function F(x,y) is self dual ?

    (A) $xy + x'v'$

    (B) $x + y$

    (C) $xy + yx' + x'$

    (D) x

6. A Boolean Function F(x,y) that can be represented by a threshold gate is termed as Threshold function. Which of the following is Not a threshold function ?

    (A) xy

    (B) $x + y$

    (C) x XOR Y

    (D) All the above

7. Floating point numbers in a computer are represented using a 10-bit mantissa (including a sign bit) and a 7-bit exponent (including a sign bit). What is the approximate value of the maximum number, which can be represented ? Assume that the mantissa is stored in the normalised form, that is, without leading zeroes.

(A) 2^{128}

(B) 2^{127}

(C) 2^{64}

(D) 2^{63}

8. "static" in the following program excerpt (file prog.cpp) means that :

void myfunc()

{

   static int a;

...}

(A) The function is not reentrant

(B) a is allocated on the stack of the function myfunc

(C) a is visible only in the file prog.cpp

(D) a is a constant

9. What is output ?

short* a = 0;

void main(){a+=2; printf("%d",a);}

(A) 2   (B) 4

(C) 8   (D) 0

10. How is memory, pointing to an int-variable, correctly allocated ?

(A) int* pi = (int*)malloc(4);

(B) int* pi = new int;

(C) int* pi = new sizeof(int);

(D) None of the above

11. In C++, which of the following operators cannot be overloaded ?

(A) ?:

(B) []

(C) − −

(D) =

12. Which is the correct tag to display a picture?

(A) <imgsrc = "Picture.jpg" >

(B) <imgcrs = "Picture.jpg" >

(C) <imgscr = "Picture.jpg" >

(D) <img source = "Picture.jpg" >

13. If storage class is missing in the array definition, by default it will be taken to be

(A) automatic

(B) external

(C) static

(D) either automatic or external depending on the place of occurrence

14. Which of the following is suitable for converting a weak entity set into a strong entity set in ER Modelling ?

(A) Using Generalization

(B) Using aggregation

(C) Add suitable attributes

(D) All the above

15. Which of the following is False ?

(A) BCNF Partially eliminates redundancy due to FDs

(B) 4NF eliminates redundancy due to MVDs.

(C) 3NF preserves FDs

(D) Binary relation is always in BCNF

16. Consider the relation scheme R(A,B,C) with the functional dependencies $AB \rightarrow C$ and $C \rightarrow A$, then the scheme is in

(A) Third normal form but not in BCNF

(B) Second normal form but not in 3NF

(C) Boyce-Codd Normal Form

(D) Only in Second Normal Form

17. Which of the following statements about the view concept in SQL is INVALID ?

(A) The definition of a view should not have an ORDER BY clause in it

(B) All views are not updatable

(C) The views are instantiated at the time they are referenced and not when they are defined

(D) The views may be referenced in an SQL statement wherever tables are referenced

18. A hash function f defined as f(key) = key mod 7, with linear probing, is used to insert the keys 37, 38, 72, 48, 98, 11, 56 into a table indexed from 0 to 6. What will be the location of key 11?

  (A) 0   (B) 2

  (C) 3   (D) 5

19. Average successful search time taken by binary search on a sorted array of 10 items is

  (A) 2.9   (B) 2.8

  (C) 2.7   (D) 2.6

20. Inverted list organization

  (A) means storing records in contiguous blocks according to a key

  (B) stores records sequentially but uses an index to locate records

  (C) uses an index for each key type

  (D) has records placed randomly throughout the file

21. Create AVL tree for the nodes 70, 60, 80, 50, 65 and 68. How many leaves are there in the resultant tree ?

  (A) 2

  (B) 3

  (C) 4

  (D) 5

22. Assume that the operators +, −, x are left associative and ^ is right associative. The order of precedence (from highest to lowest) is ^, x, +, −. The postfix expression corresponding to the infix expression a + b x c − d ^ e ^ f is

  (A) abc x + def ^ ^ −

  (B) abc x + de ^ f ^

  (C) ab + c x d − e ^ f ^

  (D) − + a x bc ^ ^ def

23. A program reads in 500 integers in the range (0, 100) representing the marks of 500 students. It then prints the frequency of each mark above 50. What be the best way for the program to store the frequencies ?

(A) An array of 550 numbers

(B) An array of 100 numbers

(C) An array of 50 numbers

(D) A dynamically allocated array of 500 numbers

24. In OSI, Flow control is an issue for

(A) physical layer

(B) application layer

(C) network layer

(D) transport layer

25. The routing algorithm takes the decision to change the route when

(A) router changes

(B) transmission time does not change

(C) topology changes

(D) user changes

26. In Public key cryptography, which of the following statements is/are correct

I. Everybody(public) can decrypt the message without help

II. One has to get the public key from CA for decrypting

III. Sender uses public key to encrypt

(A) I only

(B) II only

(C) II and III only

(D) all of these

27. The interrupt that is generated when division by zero is termed as

(A) Program interrupt

(B) User interrupt

(C) I/O interrupt

(D) Timer interrupt

28. When exceptional situation occurs outside CPU, the hardware signal given is that

(A) RESET

(B) INTERRUPT

(C) HOLD

(D) EXIT

29. In a two-pass assembler, adding literals to literal table and address resolution of local symbols are done during

(A) First pass and second pass respectively

(B) Second pass

(C) Second pass and first pass respectively

(D) First pass

30. A grammar with productions $E \rightarrow E + E \mid E * E$ is

(A) Unambiguous

(B) Regular

(C) Ambiguous

(D) None of the above

31. It is possible for Belady's anomaly to occur in _____ page replacement method.

(A) Optimal

(B) FIFO

(C) LIFO

(D) LRU

32. The module that gives control of the CPU to the process selected by the short-term scheduler is

(A) Context Switcher

(B) Compiler

(C) Dispatcher

(D) Monitor

33. In Unix Operating System, an image is defined as an execution environment. Appropriate order of the three components of the image are

(A) text segment, code segment and map segment

(B) program text segment, data segment and stack segment

(C) text segment, map segment and data segment

(D) code segment, function segment and data segment

34. Expansion of SPOOL

(A) Simultaneous Processor Operation On Line

(B) Simultaneous Peripheral Operation On Line

(C) Simultaneous Peripheral Operation Off Line

(D) Simultaneous Processor Operation Off Line

35. Kernel comprises of

(A) Secondary routines of Operating Systems

(B) Monitoring routines of the Operating Systems

(C) The set of primitive functions upon which rest of the operating system functions are built

(D) Supervisory routines of Operating Systems

36. Semaphore variables can be edited by

(A) User processes only

(B) User processes and supervisory processes

(C) Supervisory processes only

(D) None of the above

37. For a software, mean time to failure is equal to mean time to repair. What is the availability of the software ?

(A) 90%

(B) 80%

(C) 70%

(D) 50%

38. By computing the Cyclomatic Complexity of a graph G having 13 vertices, 4 decision vertices, 1 connector, find the number of edges in G.

   (A) 13

   (B) 10

   (C) 9

   (D) 8

39. What is the appropriate pairing of items in the two columns listing various activities in a software life cycle ?

Group 1	**Group 2**
P) Requirements Analysis	1. Module development and integration
Q) Design	2. Domain Analysis
R) Implementation	3. Performance Tuning
S) Maintenance	4. Structural and Behavioral Modelling

   (A) P-4, Q-2, R-3, S-1

   (B) P-3, Q-4, R-1, S-2

   (C) P-2, Q-3, R-1, S-4

   (D) P-2, Q-1, R-3, S-4

40. Acceptance testing is

   (A) running the system with line data by the actual user

   (B) making sure that the new programs process certain transactions according to specifications

   (C) checking the logic of one or more programs in the candidate systems

   (D) testing changes made in an existing or a new program

41. _____ is wireless protocol used to communicate for short distances.

   (A) Blue Tooth

   (B) Firewire

   (C) Ethernet

   (D) IEEE 802.3

42. _____ transmission is good for homes and small businesses because they receive mode data than they send.

(A) DSL

(B) SDSL

(C) ADSL

(D) UTP

43. Data Warehouse Design is based upon the concept of _____, which is a retrieval based model that supports high volume query access.

(A) Entity Relationship modelling

(B) Dimension Modelling

(C) OLAP

(D) OO data model

44. Large Companies have limit to use data warehousing due to high cost of development. In such situations, companies use a lower cost, scaled down version of data warehouse. The name of such data warehouse is termed as

(A) Distributed database

(B) Operational data store

(C) Dependent data mart

(D) Independent data mart

45. Apriori Algorithm is used for

(A) Forming clusters

(B) Classifying the objects

(C) Association

(D) None of the above

46. ID3 algorithm uses _____ measure.

(A) Loss

(B) Gini index

(C) Gain ratio

(D) Gain

47. Asynchronous Transfer Mode (ATM) has which of the following features ?

I. It is connection oriented

II. It can reach high speeds (10 gbps)

III. It uses fixed 53 byte cells

(A) I and II

(B) II and III

(C) All of these

(D) I and III

48. SAP and Oracle are examples of

(A) Large Enterprise ERP

(B) Medium Business ERP

(C) Small Business ERP

(D) Non-ERP Database Companies

49. Which of the following Statements are correct ?

I. Windows uses priority based pre-emptive scheduling

II. Unix uses priority based pre-emptive scheduling

III. Windows uses round robin based pre-emptive scheduling

IV. UNIX uses round robin based pre-emptive scheduling

(A) I and II

(B) III and IV

(C) I and IV

(D) II and III

50. With respect to GPRS, identify correct statement(s)

I. It is a scheme for third Generation mobile telephony

II. It is an overlay packet network on top of GSM

(A) I and II only   (B) I only

(C) II only   (D) None

Space for Rough Work

Space for Rough Work