COMPUTER SCIENCE & APPLICATIONS

Paper - II

Signature of Invigilators

Roll No. ☐☐☐☐☐☐
(In figures as in Admit Card)

1. .....

Dec-08/19

Roll No. .....

2. .....

.....
(in words)

Name of the Areas/Section (if any) .....

Time Allowed : 75 Minutes] **[Maximum Marks : 100**

Instructions for the Candidates

1. Write your Roll Number in the space provided on the top of this page.
2. This paper consists of **fifty (50)** multiple choice type questions. **All** questions are compulsory.
3. Each item has upto four alternative responses marked (A), (B), (C) and (D). The answer should be a capital letter for the selected option. The answer letter should entirely be contained within the corresponding square.

   Correct method [A] Wrong method [A] OR [A]
4. Your responses to the items for this paper are to be indicated on the ICR Answer Sheet under Paper II only.
5. Read instructions given inside carefully.
6. Extra sheet is attached at the end of the booklet for rough work.
7. You should return the test booklet to the invigilator at the end of paper and should not carry any paper with you outside the examination hall.

પરીક્ષાર્થીઓ માટે સૂચનાઓ :

૧. આ પાનાની ટોચમાં દર્શાવેલી જગ્યામાં તમારો રોલનંબર લખો.

૨. આ પ્રશ્નપત્રમાં બહુવૈકલ્પિક ઉત્તરો ધરાવતા કુલ **પચાસ (૫૦)** પ્રશ્નો આપેલા છે. **બધા જ** પ્રશ્નો ફરજિયાત છે.

૩. પ્રત્યેક પ્રશ્ન વધુમાં વધુ ચાર બહુવૈકલ્પિક ઉત્તરો ધરાવે છે. જે (A), (B), (C) અને (D) વડે દર્શાવવામાં આવ્યા છે. પ્રશ્નનો ઉત્તર કેપીટલ સંજ્ઞા વડે આપવાનો રહેશે. ઉત્તરની સંજ્ઞા આપેલ ખાનામાં બરાબર સમાઈ જાય તે રીતે લખવાની રહેશે.

   ખરી રીત : [A] ખોટી રીત : [A] , [A]

૪. આ પ્રશ્નપત્રના જવાબ આપેલ ICR Answer Sheet ના Paper II વિભાગની નીચે આપેલ ખાનાઓમાં આપવાના રહેશે.

૫. અંદર આપેલ સૂચનાઓ કાળજીપૂર્વક વાંચો.

૬. આ બુકલેટની પાછળ આપેલું પાનું રફ કામ માટે છે.

૭. પરીક્ષા સમય પૂરો થઈ ગયા પછી આ બુકલેટ જે તે નિરીક્ષકને સોંપી દેવી. કોઈપણ કાગળ પરીક્ષા ખંડની બહાર લઈ જવો નહીં.

COMPUTER SCIENCE AND APPLICATIONS

PAPER-II

Note : This paper contains **FIFTY (50)** multiple-choice/Assertion and Reasoning/Matching questions, each question carrying **two (2)** marks. Attempt ALL the questions.

નોંધ : આ પ્રશ્નપત્રમાં **પચાસ (૫૦)** બહુવૈકલ્પિક પ્રશ્નો છે. દરેક પ્રશ્નના **બે (૨)** ગુણ છે. બધા પ્રશ્નો ફરજિયાત છે.

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1. Let A be a set of order 3. The number of different binary relations on A are :

   (A) 8 (B) 64

   (C) 256 (D) 512

2. The number of bit strings of length which either start with a 1 bit or end with the two bits 00 are :

   (A) 128 (B) 160

   (C) 192 (D) 64

3. Suppose that someone starts a chain letter. Each person who receives the letter is asked to send it on to four other people. Some people do this, but others do not send any letters. How many people have seen the letter including the first person, if no one receives more than one letter and if the chain letter ends after, there have been 100 people who read it but did not send it out ?

   (A) 133 (B) 166

   (C) 200 (D) 233

4. Which of the following is *not true* for $<Z_7, t_7, X_7>$?

   (A) It is a group of order 7 under t_7

   (B) It is a group of order 7 under X_7

   (C) It is a finite ring

   (D) It is a field

5. Finite state machine can recognize :

   (A) any grammar

   (B) any regular grammar

   (C) any context free grammar

   (D) any unambiguous grammar

6. A logic is an electronic circuit which :

(A) makes logic decisions

(B) allows electron flow only in one direction

(C) works on binary algebra

(D) alternates between 0 and 1 value

7. A NAND gate is OFF only when all its inputs are :

(A) off (B) negative

(C) high (D) low

8. The Binary equivalent of the decimal number 39.125 is :

(A) 101001.101 (B) 100111.001

(C) 101011.001 (D) None of the these

9. The minimize function for expression F(X,Y,Z) m (0,2,4,6) using a k-map is :

(A) F $\bar{Z}$ (B) F $\bar{X}\,\bar{Z}$

(C) F $\bar{X}$ (D) F Y

10. Which one of the following is universal flip-flop :

(A) RS Flip-flop (B) JK Flip-flop

(C) T Flip-flop (D) D Flip-flop

11. Consider the following code :

int z, $x = 5$, $y = -10$, $a = 4$, $b = 2$;

$z = x + + - - - y * b/a$

What value is assigned to z in the above code ?

(A) 5 (B) 6

(C) 10 (D) 11

12. Which of the following statements is *correct* about the definition of a variable and declaration of a variable ?

(A) Both can occur multiple times, but a declaration must occur first.

(B) Both can occur multiple times, but a definition must occur first.

(C) A definition occurs once, but a declaration may occur many times.

(D) A declaration occurs once, but a definition may occur many times.

13. If a variable has been declared with file scope as shown below, can it be safely accessed from another file ?

int var ;

(A) Yes, it can be referenced through the register specifier.

(B) No, it would have to have been declared as a static variable.

(C) No, it should have been initially declared using global keyword.

(D) Yes, it can be referenced through the extern specifier.

14. What makes a class abstract ?

(A) The class must not have method definitions.

(B) The class must have a constructor that takes no arguments.

(C) The class must have a function definition equal to zero.

(D) The class must be defined using abstract keyword.

15. Suppose that the class test does not have an overloaded assignment operator. What happens when an assignment $a = b$; is used for two test objects a and b ?

(A) The automatic assignment operator is used.

(B) The copy constructor is used

(C) Compiler error

(D) Run-time error

16. There are two entities : (*i*) BUILDING (Bldg_no, No_of_floors, Size, Vacancy) and (*ii*) APARTMENT (Apt_no, No_of_bedrooms, No_of_bathrooms, sq_ft, Rent). The relationship "BUILDING contains APARTMENT" exists between these two entities. Which of the following is *true* :

(A) Both BUILDING and APARTMENT are strong entities

(B) BUILDING is a strong entity but APARTMENT is a weak entity

(C) Both BUILDING and APARTMENT are weak entities

(D) APARTMENT is a strong entity but BUILDING is a weak entity.

17. Elements of SQL-schema are :

(A) Only base tables definitions.

(B) Only base tables and views definitions.

(C) Definitions of only base tables, views and constraints.

(D) Definitions of base tables, views, constraints, domains and others.

18. Which of the following is *true* for a SELECT statement (of SQL) using COUNT ( ) :

(A) COUNT (*) and COUNT (column name) both will always give the same result, i.e., total number of rows.

(B) COUNT (*) will include while COUNT (column name) will exclude rows with null values.

(C) COUNT (column name) and COUNT (DISTINCT column name) will give the same result always.

(D) None of the above statements is correct.

19. We use outer joins for the relations R and S, if we want to keep :

(A) All the tuples in R (B) All the tuples in S

(C) Both (A) and (B) (D) None of these

20. Which of the following statements is *true* about a view ?

(A) View does not store actual data

(B) Views allow the same data to be seen by different users in different ways at the same time

(C) Both (A) and (B) are correct statements

(D) Neither statement (A) nor statement (B) is correct

21. Which of the following is a good reason to use linked lists in a program ?

(A) To make execution faster

(B) To access any element randomly

(C) To allocate space dynamically whenever needed

(D) To make deletion of elements easier

22. Which of the following cannot be a valid post-order traversal for any min Heap with elements 1, 2, 3, 4, 5 ?

(A) 4 5 3 2 1 (B) 4 5 2 3 1

(C) 3 5 2 4 1 (D) 5 3 4 2 1

23. There are 4 ! (24) different sequences to insert the four numbers 1, 2, 3, 4 into an initially empty Binary Search Tree.

How many distinct Binary Search Trees are actually produced by these 24 insertion sequences ?

(A) 8 (B) 14

(C) 16 (D) 24

24. Let H be a hash table of size 7 which uses chaining to handle collisions. Let the hash function :

h (^) = (sum of the digits of n which are even) mod 7

be used to insert numbers into H. If we insert 25 numbers between 1 and 40 (both inclusive) into H, what is the length of longest chain we can produce ?

(A) 20 (B) 25

(C) 16 (D) 3

25. Which of the following statements is *false* about B-trees of minimum degree 2 ?

(A) All leaves are at same level

(B) Every internal node has at most 4 children

(C) Every internal node has at least 2 children

(D) No internal node can have 3 children

26. DHCP protocol is used for :

(A) finding MAC address of a host

(B) assign IP address to a host

(C) establish connection between server and host

(D) to test network layer connectivity

27. A 802.11 wireless network uses the following electromagnetic spectrum :

(A) Licensed spectrum

(B) Spectrum reserved for scientific and medical applications

(C) Same spectrum as used by mobile operators

(D) All of the above

28. Routing table in router provides information about :

(A) Complete route to the destination for the incoming packet

(B) Congestion in the network ahead

(C) Available bandwidth to the destination

(D) Next hop information for the incoming packet

29. The ATM cell header contains which of the following for error correction :

(A) Checksum (B) CRC

(C) Parity (D) None of these

30. Which of the following services is *not* provided by wireless access point in 802.11 WLAN :

(A) Association (B) Disassociation

(C) Error correction (D) Authentication

31. The main function of Lexical Analysis in a compiler is to :

(A) Detect left recursion (B) Recognize symbols

(C) Check if grammar is LR (0) (D) Check for ambiguity

32. Which of the following statements about LL(1) grammar is *false* ?

(A) It has no left recursion

(B) It can generate recursive descent parser

(C) It cannot be passed deterministically

(D) It has no ambiguity

33. Which of the following statements is *not* true about YACC ?

(A) It takes LALR(1) grammar as input

(B) It produces LR parser as output

(C) It can embed compile time actions in output

(D) It cannot detect shift-reduce conflicts

34. Which of the following is *not* an example of Intermediate code generated by a compiler ?

(A) 3-address code

(B) RISC code for SPARC processor

(C) Byte code for JVM

(D) P-code for Pascal

35. Which of the following is *not* a characteristic of RISC architecture ?

(A) Micro-programming (B) Fixed length instructions

(C) General purpose registers (D) Simple addressing

36. The advantage of automatic memory management is :

(A) Module interfaces are cleaner

(B) Memory management is often more efficient

(C) The programmer is freed to work on the actual problem

(D) All of the above

37. In management of virtual memory, when a new item is to be brought in and there is no free real memory, which item to evict in order to make room for the new one is a :

(A) Placement policy (B) Allocation policy

(C) Replacement policy (D) Fetch policy

38. A real time operating system is characterized by :

(A) Blocking of system call (B) Preemptive kernel

(C) Resource reservation (D) Non-preemptive kernel

39. Which of the following is *not* useful for solving the mutual exclusion problem ?

(A) Disabling interrupts (B) Semaphores

(C) Sockets (D) TSL (Test and set lock)

40. To write a Unix shell script to count the number of lines in which "Ram" appears, which of the following commands is most useful ?

(A) sort (B) grep

(C) cut (D) awk

41. Which of the following SDLC models makes explicit provision for risk analysis.

(A) Spiral model (B) RAD model

(C) Waterfall model (D) Incremental model

42. What are the four P's of effective software project management ?

(A) People, Process, Product, Protocol

(B) People, Process, Product, Project

(C) People, Product, Problem, Project

(D) Participants, Process, Product, Project

43. For a software project, which of the following is *not* a functional requirement.

(A) Software should authenticate its users

(B) Software should communicate with the legacy system

(C) Software should provide on-line help

(D) Software should be built using open-source technologies

44. Which of the following is a tool for requirement analysis ?

(A) CRC (B) Use-case

(C) Story-board (D) All of these

45. Which of the following is *not* a software metric ?

(A) Lines of code (LOC)

(B) Defects per KLOC

(C) No. of features implemented per day

(D) No. of users input

46. Frame relay networks are based on the assumption that :

(A) the network nodes have very high processing power

(B) distance between nodes is very small

(C) bandwidth between the nodes is very high

(D) bit error rate of the transmission medium is very low

47. The code division multiple access method for mobile communication has :

(A) fixed code but different channel for each user

(B) one channel for all users

(C) more than one channel for each user

(D) none of the above

48. Firewall is *not* effective, if :

(A) User inside the firewall behaves ethically

(B) Security policy is well defined

(C) A strong deny facility is implemented

(D) Highly flexible filtering policy is used

49. In switched multimegabit networks the processing time at routers is reduced by adopting the following :

(A) routers using very fast network processors

(B) by reducing size of the routing table by dividing it into zones

(C) by using indexing mechanism using tags

(D) by reducing the buffer sizes in router

50. The secure socket layer adds which of the following security features to TCP/IP protocol :

(A) mutual authentication of client server

(B) encryption and compression

(C) user authentication

(D) all of the above.

ROUGH WORK