ENTRANCE EXAMINATION FOR ADMISSION, MAY 2012.

M.Sc. (COMPUTER SCIENCE)

COURSE CODE : 370

Register Number :

Signature of the Invigilator
(with date)

COURSE CODE : 370

Time : 2 Hours Max : 400 Marks

Instructions to Candidates :

1. Write your Register Number within the box provided on the top of this page and fill in the page 1 of the answer sheet using pen.
2. Do not write your name anywhere in this booklet or answer sheet. Violation of this entails disqualification.
3. Read each of the question carefully and shade the relevant answer (A) or (B) or (C) or (D) or (E) in the relevant box of the ANSWER SHEET using HB pencil.
4. Avoid blind guessing. A wrong answer will fetch you –1 mark and the correct answer will fetch 4 marks.
5. Do not write anything in the question paper. Use the white sheets attached at the end for rough works.
6. Do not open the question paper until the start signal is given.
7. Do not attempt to answer after stop signal is given. Any such attempt will disqualify your candidature.
8. On stop signal, keep the question paper and the answer sheet on your table and wait for the invigilator to collect them.
9. Use of Calculators, Tables, etc. are prohibited.

1. Time taken for addition of an element in a queue is

(A) O(1) (B) O(n)

(C) O(log n) (D) O(log 2n)

(E) None of the above

2. In AND/OR Graph edges represents

(A) Problem reduction operator (B) Solution

(C) Cost (D) All of the above

(E) None of the above

3. Numerical value associated with edges of a graph are termed as

(A) Cost (B) Length

(C) Weight (D) All of the above

(E) None of the above

4. If the pre-order traversal of a binary tree is ABCDE, then in-order traversal can be

(A) ABCDE (B) EDCBA

(C) BADCE (D) CDEAB

(E) None of the above

5. Time required to insert an element and the time required to delete all the elements in a stack with linked list implementation can be estimated as

(A) O(1) and O(1) respectively (B) O(1) and O(n) respectively

(C) O(n) and O(1) respectively (D) O(n) and O(n) respectively

(E) None of the above

6. In data structures, such as Operations, storage structure and Algorithms are defined based on the concept of

(A) Abstract Data Types (B) User Defined data types

(C) Language defined data types (D) All of the above

(E) None of the above

7. What is the time complexity of binary search?

(A) O(log n) (B) O(n)

(C) O(1) (D) O (nlog n)

(E) None of the above

8. One of the easiest ways to sort a table is by

(A) Merge sort (B) Bubble sort

(C) Quick sort (D) Selection sort

(E) None of the above

9. Which of the following is the application of stack?

(A) Function calls (B) Large Arithmetic

(C) Evaluation of arithmetic expressions (D) All of the above

(E) None of the above

10. In a BST, post order traversal visits through

(A) left – right – root
(B) root – left – right
(C) root – right – left
(D) left – root – right
(E) None of the above

11. The average case of insertion operation and delete operations of array based list are estimated as _____ and _____ respectively.

(A) O(n) and O(1)
(B) O(1) and O(n)
(C) O(log n) and O(n)
(D) O(n) and O(log n)
(E) None of the above

12. If 'd' is the level of the leaf nodes, the total number of nodes in a completely binary tree is given by

(A) $2^{d+1}-1$
(B) $2^{d-1}+1$
(C) $2^{d+1}+1$
(D) $2^{d-1}-1$
(E) None of the above

13. In data transmission, the bit coding scheme used to represent a byte is typically

(A) EBCDIC
(B) ASCII
(C) Hexadecimal
(D) All of the above
(E) None of the above

14. If a bucket is full, records are inserted in some other buckets as the number of buckets is fixed, refers to

(A) Closed hashing
(B) Overflow chaining
(C) Open hashing
(D) All of the above
(E) None of the above

15. Network file systems are designed to provide

(A) Medium level of availability
(B) Base level of availability
(C) Low level of availability
(D) High level of availability
(E) None of the above

16. The technique of using multiple routes between a single pair of nodes is called _____.

(A) Shortest path routing
(B) Bifurcated Routing
(C) Isolated Routing
(D) Centralized Routing
(E) Distributed Routing

17. ADSL stands for

(A) Access Data Secure Layer
(B) Additional Data Socket Layer
(C) Asymmetrical Digital Subscriber Line
(D) Asynchronous Data Security Logic
(E) None of the above

18. WiMax is

(A) Wireless Maximization

(B) Wireless Mac extension

(C) Worldwide Interoperability for Microwave Access

(D) Wireless Media access extension

(E) None of the above

19. Each Abstract Data Type description consists of

(A) Data and functions (B) Variables and functions

(C) Data and operations (D) All of the above

(E) None of the above

20. MDR (Memory Data Register) holds the

(A) Number of Memory Locations (B) Address of a memory location

(C) Number of Address bits (D) All of the above

(E) None of the above

21. The job of hash functions is to map keys to

(A) Integers (B) Floats

(C) Characters (D) Key addresses

(E) None of the above

22. Different between paging and segmentation is

(A) Virtual memory management (B) Main memory management

(C) Control bits (D) All of the above

(E) None of the above

23. In Semaphores Special variable of Primitive Wait(s) is used

(A) To receive a signal (B) To transmit a signal

(C) To communicate a signal (D) All of the above

(E) None of the above

24. List out which of the following is not comes under the process Control Identification

(A) Control monitoring (B) Inter process communication

(C) Scheduling and state information (D) All of the above

(E) None of the above

25. Each process using the shared data (variables) excludes all others from doing so simultaneously. This is called

(A) Race conditions
(B) Critical section
(C) Mutual exclusion
(D) All of the above
(E) None of the above

26. What is the effect of increasing the time quantum to an arbitrarily large number for Round Robin scheduling?

(A) The average wait time decreases
(B) The average turnaround time increases
(C) The algorithm behaves exactly as same as nonpreemptive FCFS
(D) All of the above
(E) None of the above

27. Which of the following agrees with the Virtual memory concept?

(A) Page conversion is not possible.
(B) The process size can exceed total memory size and can still be executed.
(C) Reduces the performance of the system.
(D) All of the above
(E) None of the above

28. Which criteria are not chosen for determining the scheduling policy?

(A) Throughput
(B) Waiting time
(C) Program size
(D) Response time
(E) None of the above

29. How many hard disks can be connected in a SCSI interface?

(A) 4
(B) 8
(C) 12
(D) 16
(E) None of the above

30. Which one has a transmission rate of 5 to 10 Characters/msec.

(A) Magnetic Tapes
(B) Magnetic Drums
(C) Magnetic Disk
(D) Floppy Disk
(E) None of the above

31. The organization and management of data structures take place in:

(A) Primary Memory
(B) Secondary Memory
(C) External Memory
(D) Primary & Secondary Memory
(E) None of the above

32. Which one is called as direct-access-storage device?

(A) Tracks
(B) Disks
(C) Tape
(D) Drum
(E) None of the above

33. A microprocessor understand only

(A) Mnemonic Codes
(B) Decimal Codes
(C) Hexa Decimal Code
(D) Binary Code
(E) Gray Codes

34. In which way(s) a macro processor for assembly language can be implemented?

(A) Independent two-pass processor
(B) Independent on-pass processor
(C) Processor incorporated into pass 1 of a standard two-pass assembler
(D) All of the above
(E) None of the above

35. In standard TTL, the 'totem pole' stage refers to

(A) The multi-emitter input stage
(B) The phase-splitter
(C) The output buffer
(D) All of the above
(E) None of the above

36. How many truth tables can be made from one function table?

(A) One
(B) Two
(C) Three
(D) All of the above
(E) None of the above

37. PLA can be used

(A) As a microprocessor
(B) As a dynamic memory
(C) To realize a sequential circuit
(D) To realize a combinational circuit
(E) None of the above

38. A shift register can be used for

(A) Parallel to serial conversion
(B) Serial to parallel conversion
(C) Digital delay line
(D) All of the above
(E) None of the above

39. The Schmitt trigger may be used to

(A) Change voltage to corresponding frequency

(B) Change frequency to voltage

(C) Slowly varying square input

(D) All of the above

(E) None of the above

40. What will be the output of the program?

```
main()
{
main();
}
```

(A) Recursive function

(B) Runtime error : Stack overflow

(C) Pointer error

(D) None

(E) All the above

41. What will be the value of `a` after the following code is executed?

```
#define square(x) x*x
a = square(2+3)
```

(A) 25

(B) 13

(C) 11

(D) Error

(E) None of the above

42. What is the output of the following code?

```
int arrsize(int [ ])
main ( )
{
int a[ ]={0,1,2};
printf("%d",arrsize(a));
}
int arrsize(int a[ ])
{
return (sizeof(a));
}
```

(A) 2

(B) 0

(C) 6

(D) Garbage

(E) None of the above

43. Which of the following is not a logical data-base structure?

(A) Tree
(B) Network
(C) Relational
(D) All of the above
(E) None of the above

44. Databases are very much concerned with a concept called

(A) Data Dependence
(B) Data Repetition
(C) Data Independence
(D) All of the above
(E) None of the above

45. Let R(a,b,c) and S(d,e,f) be two relations with 'a', 'b', 'c' as attributes of the relation R and 'd', 'e', 'f' as attributes of relation S . If the attribute 'd' is the foreign key of relation S and that also refers to the primary key of R, which of the following statements is not true?

(A) d is also the primary key of S
(B) d is NULL in some of the tuples
(C) d is a composite key
(D) d is a composite key composed of attributes having some values NULL and others not NULL
(E) None of the above

46. Which of the following statements in not true about Deferred update scheme?

(A) The WRITE operation is deferred until a transaction partially commits.
(B) A transaction is said to be partially committed before its final action iscompleted
(C) All the log records are written to stable storage before any updates are performed
(D) All of the above
(E) None of the above

47. What is an inference attack?

(A) Incorrect information in a database
(B) Partial disclosure of information to an unauthorized individual
(C) Trying to obtain information from a database by making connections between seemingly unrelated data
(D) A security measure that alerts the database administrator that a breach of confidentiality has occurred
(E) None of the above

48. Which of the following normal form is considered adequate for normal relationship database design?

(A) 2 NF
(B) 3 NF
(C) 4 NF
(D) 5 NF
(E) None of the above

49. When considering database usability issues, what does information density refer to?

(A) The amount of data appearing on the screen
(B) Information enabling the user to identify their location in the database
(C) The type of relationship between two entities
(D) Prompts or text boxes with reminders or alerts
(E) None of the above

50. Which of the following statement is not true about Views?

(A) User should have the permissions on the table referred to create a view
(B) New names can be assigned to the columns in the view
(C) View occupies a different memory space than the table referred
(D) Rows and columns inside the view are actually selected from existing tables by a query that defines the view
(E) None of the above

51. Testing based on the software engineer's intuition and experience is called as

(A) Ad hoc testing
(B) Alpha and Beta testing
(C) Recovery testing
(D) All of the above
(E) None of the above

52. Defect Removal Efficiency (DRE) quality metric is defined as

(A) $DRE = E \times (E - D)$
(B) $DRE = E / (E + D)$
(C) $DRE = E \times (E / D)$
(D) All of the above
(E) None of the above

53. In software management, baselines measure quantifies the

(A) Situation prior to change
(B) Effects of change
(C) Desirability of change
(D) All of the above
(E) None of the above

54. An activity that verifies compliance with policies and procedures and ensures that resources are conserved is called

(A) Audit
(B) review
(C) Assessment
(D) Walkthrough
(E) None of the above

55. When viewing product/service Quality from the customer's view, a feature added by the producer, which was not included in the product specifications/ requirements would be called as

(A) An enhancement
(B) A defect
(C) A correction
(D) All of the above
(E) None of the above

56. Function Points

(A) Provide a measure of the system size
(B) Can be used to compare different kinds of application systems
(C) Together with past data can be used to estimate future effort
(D) All of the above
(E) None of the above

57. Software development effort can be estimated by

(A) Problem based attributes
(B) Process based attributes
(C) Empirical estimates
(D) All of the above
(E) None of the above

58. The Longest software life-cycle phase is

(A) Implementation and testing
(B) Software design
(C) Operation and maintenance
(D) All of the above
(E) None of the above

59. A decision-support system is intended to produce information to support which type of decision

(A) Well-structured
(B) Unstructured
(C) Anticipated
(D) Routine
(E) None of the above

60. Which of the following is not a level of information handling?

(A) Decision support system
(B) Operations assistance system
(C) Transaction processing system
(D) Office automation system
(E) None of the above

61. The architecture based on Object Request Broker (ORB) is

(A) File sharing architecture
(B) Client/Server architecture
(C) Distributed/Collaborative architecture
(D) All of the above
(E) None of the above

62. In Distributed Environment, Physical separation means

(A) May be Local Area Network (B) May be Wide Area Network

(C) May be Bus Topology (D) All of the above

(E) None of the above

63. Which acts as a proxy for the remote objects?

(A) Stubs (B) Skeletons

(C) Registry (D) Directory services

(E) None of the above

64. The Degenerate case occurs in Distributed Environment

(A) When all of the components are on different system

(B) When all of the components should be different system

(C) When all of the components are on same system

(D) All of the above

(E) None of the above

65. Real-time systems are usually

(A) Event-driven systems (B) Interrupt-driven systems

(C) Distributed systems (D) All of the above

(E) None of the above

66. CORBA is abbreviated as

(A) Common Object Related Broker Architecture

(B) Clustered Object Request Broker Architecture

(C) Complementary Object Related Broker Architecture

(D) Common Object Request Broker Architecture

(E) None of the above

67. Heuristics evaluation function

(A) Guesses the goodness of a state (B) Provides direct solution

(C) Moves away from solution (D) All of the above

(E) None of the above

68. The search methods which estimates the cost from current state to goal are called

(A) Heuristic method (B) Real methods

(C) Weak methods (D) All of the above

(E) None of the above

69. An example of system development program is

(A) Operating system (B) Performance monitors

(C) Database management systems (D) Language translator

(E) None of the above

70. Uniform symbol table

(A) Contains all constants in the program

(B) Is a permanent table of decision rules in the form of patterns for matching with the uniform symbol table to discover syntactic structure

(C) Consists of full or partial list of the tokens as they appear in the program created by lexical analysis and used for syntax analysis and interpretation

(D) A permanent table which lists all key words and special symbols of the language in symbols form

(E) None of the above

71. Consider the grammar

$S \rightarrow ABCc \mid Abc$

$BA \rightarrow AB$

$Bb \rightarrow bb$

$Ab \rightarrow ab$

$Aa \rightarrow aa$

Which of the following sentences can be derived by this grammar?

(A) abc (B) aab

(C) abcc (D) All of the above

(E) None of the above

72. The following context free grammar

$S \rightarrow aB \mid bA$

$X \rightarrow b \mid aS \mid bAA$

$B \rightarrow b \mid bS \mid aBB$

Generates strings of terminals that have

(A) Equal number of a's and b's

(B) Odd number of a's and odd number's

(C) Even numbers of a's and even numbers of b's

(D) All of the above

(E) None of the above

73. Context free language are closed under

(A) Union, intersection (B) Union, kleene closure

(C) Intersection , complement (D) All of the above

(E) None of the above

74. Let A= {0, 1} and L=A*. Let R = $\{0^n1^n, n>0\}$, then the languages UR and R are respectively

(A) Regular, regular
(B) Regular, not regular
(C) Not regular, regular
(D) All of the above
(E) None of the above

75. The linear method of collision resolution leads to an undesirable effect called

(A) Primary Clustering
(B) Secondary Clustering
(C) Complex Clustering
(D) All of the above
(E) None of the above

76. The postfix equivalent of the expression ((A + B) * C – (D – E) / (F + G)) is

(A) AB C +* –DE – FG + /
(B) AB C+ * DE – – FG + /
(C) AB + C * DE – FG –/+
(D) AB + C * DE - - FG + /
(E) None of the above

77. In an AND/OR graph the nodes representing a primitive problem is called

(A) Terminal node
(B) Real node
(C) Term node
(D) All of the above
(E) None of the above

78. In Graph Terminology, the network may be also termed as

(A) Two-way graph
(B) Directed graph
(C) Weighted graph
(D) All of the above
(E) None of the above

79. Pick the odd man out

(A) SRT is the preemptive counterpart of SJF
(B) SJF favors short jobs at the expense of longer ones.
(C) HRN strategy does not remove excessive bias against longer jobs and excessive favoritism towards short new jobs
(D) FIFO is unfair when longer jobs make shorter jobs wait
(E) Round Robin are is effective in time sharing environments in which system needs to guarantee reasonable response time for interactive users

80. Ext2 is the standard file system of

(A) Unix
(B) Windows
(C) Linux
(D) Mac OS
(E) None of the above

81. A runs 13/5 times as fast as B. If A gives a start of 240m, how far must the post be so that A and B might reach at the same time.

(A) 390 m
(B) 330 m
(C) 600 m
(D) 720 m
(E) None of the above

82. A gives B a start of 30 seconds in a km race and still beats him by 20 m. However, when he gives B a start of 35 seconds, they finish the race in a dead heat. How long does A take to run the km?

(A) 250 seconds
(B) 285 seconds
(C) 220 seconds
(D) 215 seconds
(E) None of the above

83. A can give B 20 points, A can give C 32 points and B can give C 15 points. How many points make the game?

(A) 150
(B) 200
(C) 100
(D) 170
(E) None of the above

84. A can give B a start of 50 meters or 10 seconds in a kilometer race. How long does A take to complete the race?

(A) 200 seconds
(B) 140 seconds
(C) 220 seconds
(D) 190 seconds
(E) None of the above

85. Three runners A, B and C run a race, with runner A finishing 12 meters ahead of runner B and 18 meters ahead of runner C, while runner B finishes 8 meters ahead of runner C. Each runner travels the entire distance at a constant speed.

What was the length of the race?

(A) 36 meters
(B) 48 meters
(C) 60 meters
(D) 72 meters
(E) None of the above

86. P can give Q a start of 20 seconds in a kilometer race. P can give R a start of 200 meters in the same kilometer race. And Q can give R a start of 20 seconds in the same kilometer race. How long does P take to run the kilometer?

(A) 200 seconds
(B) 240 seconds
(C) 160 seconds
(D) 140 seconds
(E) None of the above

87. How many zeros contained in 100!?

(A) 100
(B) 24
(C) 97
(D) 32
(E) None of the above

88. What is the value of M and N respectively? If M39048458N is divisible by 8 & 11; Where M & N are single digit integers?

(A) 7, 8 (B) 8, 6

(C) 6, 4 (D) 5, 4

(E) None of the above

89. Rajiv sold an article for Rs. 56 which cost him Rs.x. If he had gained x% on his outlay, what was his cost?

(A) Rs. 40 (B) Rs. 45

(C) Rs. 36 (D) Rs. 28

(E) None of the above

90. If apples are bought at the rate of 30 for a rupee. How many apples must be sold for a rupee so as to gain 20%?

(A) 28 (B) 25

(C) 20 (D) 22

(E) None of the above

91. A merchant marks his goods in such a way that the profit on sale of 50 articles is equal to the selling price of 25 articles. What is his profit margin?

(A) 25% (B) 50%

(C) 100% (D) 66.67%

(E) None of the above

92. Two boys begin together to write out a booklet containing 535 lines. The first boy starts with the first line, writing at the rate of 100 lines an hour; and the second starts with the last line then writes line 534 and so on, backward proceeding at the rate of 50 lines an hour. At what line will they meet?

(A) 356 (B) 277

(C) 357 (D) 267

(E) None of the above

93. Ram covers a part of the journey at 20 kmph and the balance at 70 kmph taking total of 8 hours to cover the distance of 400 km. How many hours has been driving at 20 kmph?

(A) 2 hours (B) 3 hours 20 minutes

(C) 4 hours 40 minutes (D) 3 hours 12 minutes

(E) None of the above

94. A train travels at an average speed of 90 km/hr without any stoppages. However, its average speed decrease to 60km/hr on account of stoppages. On an average, how many minutes per hour does the train stop?

(A) 12 minutes (B) 18 minutes

(C) 24 minutes (D) 20 minutes

(E) None of the above

95. A man moves from A to B at the rate of 4 km/hr. Had he moved at the rate of 3.67 km/hr, he would have taken 3 hours more to reach the destination. What is the distance between A and B?

(A) 33 kms (B) 132 kms

(C) 36 kms (D) 144 kms

(E) None of the above

96. A and B working together can finish a job in T days. If A works alone and completes the job, he will take T + 5 days. If B works alone and completes the same job, he will take T + 45 days. What is T?

(A) 25 (B) 60

(C) 15 (D) 35

(E) None of the above

97. A man can do a piece of work in 60 hours. If he takes his son with him and both work together then the work is finished in 40 hours. How long will the son take to do the same job, if he worked alone on the job?

(A) 20 hours (B) 120 hours

(C) 24 hours (D) 90 hours

(E) None of the above

98. A red light flashes 3 times per minute and a green light flashes 5 times in two minutes at regular intervals. If both lights start flashing at the same time, how many times do they flash together in each hour?

(A) 30 (B) 24

(C) 20 (D) 60

(E) None of the above

99. Ram, who is half as efficient as Krish, will take 24 days to complete a work if he worked alone. If Ram and Krish worked together, how long will they take to complete the work?

(A) 16 days (B) 12 days

(C) 8 days (D) 18 days

(E) None of the above

100. The mean temperature of Monday to Wednesday was 37 C and of Tuesday to Thursday was 34 C. If the temperature on Thursday was 4/5 th that of Monday, the temperature on Thursday was

(A) 36.2 (B) 36.5

(C) 36 (D) 36.7

(E) None of the above