أسم الطالب :

جامعة ذ ي قار
كلية التربية للعلوم الصرفة
قسم علوم الحاسبات

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Notes:

- Answer all questions.
- Questions are mainly divided into two groups: Group 1: MCQ (60%). Group2: short answers (40%)
- Answer in English
- It is not allowed to consult any other information during the exam except for your own knowledge and what during the exam the assistants will explain

Q.Number	Mark (Numbering)	Mark (written)	Signature
Q1			
Q2			
Q3			
Total			

Group 1: MCQ

Q1/ Choose the correct answer: (50 Marks)

1- For the deadlock prevention and deadlock avoidance schemes the statement that does not hold true is
   a. Deadlock avoidance is less restrictive than deadlock prevention
   b. In deadlock prevention, the request for resources is always granted, if the resulting state is safe
   c. It is the priority to have the knowledge of resource requirements for deadlock avoidance
   d. In deadlock avoidance, the request for resources is always granted, if the resulting state is safe
2- The instruction, Add #45,R1 does,
   a. Adds the value of 45 to the address of R1 and stores 45 in that address
   b. Adds 45 to the value of R1 and stores it in R1
   c. Finds the memory location 45 and adds that content to that of R1
   d. None of the above
3- For the expression grammar

   E->E*F I F+E I F
   F->F – I id

   The statement, which holds true, is

   a. + and – have same precedence
   b. Precedence of * is higher +
   c. Precedence of - is higher *
   d. Precedence of + is higher *
4- ---------- are statements that generally produce no executable code.
   a. declaration statements
   b. control statements
   c. computation statements
   d. structure statements

5- From the options given below, the pair having different expressive power is

   a. Deterministic Push Down Automata (DPDA) and Non-deterministic Push Down Automata (NPDA)
   b. Deterministic Finite Automata (DFA) and Non-deterministic Finite Automata(NFA)
   c. Single tape turning machine and multi tape turning machine.
   d. Deterministic single tape turning machine and Non-Deterministic single tape turning machine
6- The addressing mode/s, which uses the PC instead of a general purpose register is _____ .
   a. Indexed with offset
   b. Relative

c. direct
d. both a and c

7- For efficiently converting an infix expression to the post fix form, use
a. A parse tree
b. An operand stack
c. An operator stack
d. Both an operator and an operand stack

8- Which of the following is true about a while loop?
a. The body of the loop is executed at least once.
b. The logical expression controlling the loop is evaluated before the loop is entered and after the loop exits.
c. The body of the loop may not execute at all.
d. It cannot contain if statement.

9- PUSH(10), PUSH(20), POP, PUSH(10), PUSH(20), POP, POP, POP, PUSH(20), POP. This is the sequence of operation on stack. What will be the sequence of values that will be popped out?
a. 20, 20, 10, 10, 20
b. 20, 10, 10, 10, 20
c. 20, 10, 20, 10, 20
d. 20, 20, 10, 20, 10

10- Which one of the following statement does not hold true about Internet protocol (IP)?
a. IP packets from the same source to the same destination can take different routes in the network
b. If the packet is unable to reach its destinations within a given number of hops, IP ensures that a packet is discarded
c. A computer can have multiple IP address
d. All of the above

11- A continuous image is digitized at _____ points.
a. random
b. vertex
c. contour
d. sampling

12- The transition between continuous values of the image function and its digital equivalent is called _____
a. Quantization
b. Sampling
c. Rasterisation
d. None of the Mentioned

13- What is the tool used in tasks such as zooming, shrinking, rotating, etc.?
a. Sampling
b. Interpolation
c. Filters
d. None of the Mentioned

14- In computer network nodes are
a. the computer that originates the data

b. the computer that routes the data
c. the computer that terminates the data
d. all of the mentioned

15- What is Artificial intelligence?
a. Putting your intelligence into Computer
b. Programming with your own intelligence
c. Making a Machine intelligent
d. Playing a Game

16- Backtracking is based on,
a. Last in first out
b. First in first out
c. Recursion
d. Both a & c

17- Consider a network of LAN's, which is connected by bridges. Intermediate bridges are used to transfer the packets from one LAN to another. Between two LAN's as more than one path may exists packets may have to be routed through multiple bridges. Which one of the following reason is correct in order to use spanning tree algorithm for bridge routing?
a. For fault tolerance
b. For shortest path routing between LAN's
c. To minimize collisions
d. To avoid loops in the routing paths

18- The addressing mode, where you directly specify the operand value is _____ .
a. Immediate
b. Direct
c. Definite
d. Relative

19- In C++, which of the following is not a relational operator:
a. >=
b. = =
c. != .
d. =

20- Consider a program that reads 500 integers in the range of [0, 100] that represents the score of 500 students. Frequency of each score above 50 is then printed. For the program to store the frequencies the best way is
a. A dynamically allocated array of 550 numbers
b. An array of 100 numbers
c. An array of 500 numbers
d. An array of 50 numbers

21- The reason for the implementation of the cache memory is
a. To increase the internal memory of the system
b. The difference in speeds of operation of the processor and memory
c. To reduce the memory access and cycle time
d. All of the above

22- In asymmetric key cryptography, _____ keys are required per communicating party
a. 2

b. 3
c. 1
d. 4

23- A machine language instruction format consists of
a. Operand field
b. Operation code field
c. Operation code field & operand field
d. none of the mentioned

24- A Boolean function x'y' + xy + x'y is equivalent to
a. x' + y'
b. x + y'
c. x' + y
d. x + y

25- In a machine instruction format, S-bit is the
a. status bit
b. sign bit
c. sign extension bit
d. none of the mentioned

26- Method(s) to move data through a network of links and switches
a. Packet switching
b. Circuit switching
c. Line switching
d. Both a and b

27- In wireless ad-hoc network
a. access point is not required
b. access point is must
c. nodes are not required
d. none of the mentioned

28- Most packet switches use this principle
a. Stop and wait
b. Store and forward
c. Both of the mentioned
d. None of the mentioned

29- Which is the first step in the software development life cycle?
a. Analysis
b. Design
c. Problem/Opportunity Identification
d. Development and Documentation

30- How is software reliability defined?
a. time
b. efficiency
c. quality
d. speed

31- HyperText Markup Language (HTML) is used to specify

a. text/image format
b. video/animation format
c. sound format
d. all of above

32- A class is a collection of _____ and _____.
a. data-members , member functions
b. data-members, member functions and main()
c. data-members, member functions, main() and include statements
d. None of these

33- An object is _____
a. a variable of class data type.
b. same as a class.
c. just like a global variable.
d. collection of data-members and member functions.

34- Wrapping up of data & functions together in a class is known as _____.
a. Overloading
b. Data Abstraction
c. Polymorphism
d. Encapsulation

35- Creating a new class using one or more existing classes is known as _____.
a. Polymorphism
b. Encapsulation
c. overloading
d. inheritance

36- In the linked list implementation of the stack, the push method places the new entry on the linked list_____.
a.. At the tail
b. At the head
c. At the middle.
d. At any of the above answers.

37- Who designs and implement database structures.
a. Programmers
b. Project managers
c. Technical writers
d. Database administrators

38- _____ addressing mode is most suitable to change the normal sequence of execution of instructions.
a. Relative
b. Indirect
c. Index with Offset
d. Immediate

39- The depth of the node n_i in a tree is:
a. The length of the longest path from the root to a leaf connected to n_i.
b. The longest path from n_i to a leaf.
c. The length of the unique path from the root to n_i.

d. The path from n_i to its ancestor.

40- In _____, a table that has a concatenated primary key, each column in the table that is not part of the primary key must depend upon the entire concatenated key for its existence.
a. Third Normal Form
b. First Normal Form
c. Second Normal Form
d. General Normal Form

41- Programming language experience is a part of which factor of COCOMO cost drivers?
a. Personnel Factor
b. Product Factor
c. Platform Factor
d. Project Factor

42- Let computer A and computer B that have the IP addresses 10.105.1.113 and 10.105.1.91 respectively use the same net mask N. For A and B to belong to same network, the value of N should not be
a. 255.255.255.224
b. 255.255.255.0
c. 255.255.255.128
d. 255.255.255.192

43- $11^7 \bmod 13 = ?$
a. 10
b. 2
c. 3
d. 8

44- Which of the following is a component of an expert system?
a. Inference engine.
b. Knowledge base.
c. User interface.
d. All of the above.

45- The relational model uses some unfamiliar terminology. A tuple is equivalent to:
a. Record
b. Field
c. File
d. Database

46- The DHCP server can provide the _____ of the IP addresses.
a. dynamic allocation
b. automatic allocation
c. static allocation
d. all of the mentioned

47- While executing main program, if two or more interrupts occur, then the sequence of appearance of interrupts is called
a. multi-interrupt
b. nested interrupt
c. interrupt within interrupt
d. nested interrupt and interrupt within interrupt

48- Bluetooth is an example of
   a. personal area network
   b. local area network
   c. virtual private network
   d. none of the mentioned
49- A _____ is a device that forwards packets between networks by processing the routing information included in the packet.
   a. bridge
   b. firewall
   c. router
   d. all of the mentioned
50- Which of the following algorithm is generally used CSP search algorithm?
   a. Breadth-first search algorithm
   b. Depth-first search algorithm
   c. Hill-climbing search algorithm
   d. None of the mentione

Group 1: MCQ

Q2/ Choose the correct answer (10 Marks)

1- Performance Measures are fixed for all agents.
   a. True
   b. False
2- Cost and effort estimation of software uses only one forms of decomposition, either decomposition of the problem or decomposition of the process.
   a. True
   b. False
3- Cache memory is placed in between the CPU and ROM
   a.True
   b. False
4- One megabyte is equivalent to 1024 B
   a.True
   b. False
5- If there is no mutual exclusion condition for any resource in the system,then there is no possibility for deadlock.
   a.True
   b. False
6- If the shared resources are numbered 1 through N and a process can only ask for resources that are numbered higher than that of any resource that it currently holds, then deadlock can never happen.
   a.True
   b. False
7- When designing a database, first identify the entities, then determine the attributes, and finally establish the relationships.
   a.True
   b. False

8- In a compiler, the syntax analyzer checks every character of the source text.
   a.True
   b. False
9- Linked lists are indexed structures
   a.True
   b. False
10- DES enciphers 64-bit blocks of data with 64 bit key.

   a.True
   b. False

Group 2: Short answer

Q3 Answer the following: (40 Marks)

1- What is OSI and what role does it play in computer networks?

Answer :----------

2- What are the necessary conditions to occur deadlock?

Answer :----------

3- List the phases that constitute the front end of a compiler.

Answer :----------

4- Consider the following snapshot of a system:

Process	Arrival time	Burst time	Priority
A	0	4	3
B	1	3	4
C	2	3	6
D	3	5	5

Where highest priority number has highest priority. Compute the average of W.T and T.T by using preemptive priority algorithm.

Answer :----------

5- Design parallel Adder that is used to subtract two (3-bit) binary numbers using 2's complement

Answer :----------

6- Write a function in any structured programming language to convert positive integer number from decimal to binary system.

Answer :----------

7- A. What is the output of the following code segments?

```
#include<iostream.h>
int main ()
{
   const n=10;
   int A[n],i;
   A[0]=1;
   A[1]=2;
   for (i=2;i<n;i++)
     A[i]=A[i-1]+A[i-2];
   for (i=0;i<n;i++)
     cout<<A[i]<<endl;
return 0;
}
```

Answer :----------

B. Consider a binary tree whose inorder traversal is d b e a f c g and preorder traversal is a b d e c f g. Draw the binary tree?

Answer :----------

8- **A**. Encrypt the following message "TIME OF THE ATTACK " by using Caesar method with K=3

Answer :----------

B. Perform encryption and decryption using RSA algorithm. For the following. P=7; q=11; e=17; M=8.

Answer :----------

9- A. Within computer science discipline, write down **(in the blank entries)** full names of the following short forms

1	FIFO	
2	LAN	
3	OSI	
4	DES	

B. List the deference between internet and intranet?

Answer :----------

10- Compare between linked lists and arrays

Answer :----------
