الأسم الكامل:

University of Baghdad
College of Science
Department of Computer Science
Higher Diploma Qualification Exam
Date: 7 September 2014
Time: 3 hrs.

Notes:

- **Answer All Questions.**
- **Answer in English.**
- **It is not allowed to consult any information during the exam, depend on your own knowledge and on the clarifications given by assistants.**

Q. Number	Mark (Numbering)	Mark (Written)
Q1		
Q2		
Q3		
Q4		
Q5		
Q6		
Total		
Out of	100	

Q1: Answer with either **True** or **False**. **(20 Marks)**	**Answer**
1. Cartesian product in relational algebra is a ternary operator.	
2. The logical expression $x(y + z)$ can be evaluated using the distributive law and become equal to$(xy + xz)$.	
3. The internal components of the processor are connected by processor intra-connectivity circuitry.	
4. A polymorphic virus is one that changes how it appears and also encrypts its contents differently each time.	
5. Depth-first search is the most straight forward approach for planning algorithm.	
6. Main memory refers to the amount of storage space available on a computers disk drive.	
7. For screen mode (1024x768) the mid half area of the screen has the coordinates: Left-Top: (x=256, y=192), Right-Bottom: (767, 576)	
8. Syntax tree is produced before code generation stage.	
9. For a computer to begin running, the CPU must initialize and starts executing the bootstrap program in RAM.	
10. A data manipulation command that combines the records from one or more tables is called SELECT	
11. Linear Arrays data structure are indexed structures	
12. The function f(x)=x+1 from the set of integers to itself is onto	
13. Semaphore is a hardware for a system to solve the critical section problem.	
14. Let R be a relation on a set A. If R is reflexive, symmetric and transitive, then R is Identity relation.	
15. An ambiguous grammar have the form **N*α*N**, where ***α*** is a string of terminal only.	
16. A three dimensional object can also be represented using equation	
17. A single thread of control allows the process to perform multiple tasks at a time.	
18. A report generator is used to data entry.	
19. A solution to a problem is a path from the initial state to a goal state. Solution quality is measured by the path cost function, and an optimal solution has the highest path cost among all solutions.	
20. DoS attacks are limited to wired networks and cannot be used against wireless networks.	

Q2: Write within parenthesis the **correct** answer. **(40 Marks)**

( ) **1.** Two examples of ____ are cable television lines and telephone lines.

A. Sending devices

B. Receiving devices

C. Communications channels

D. Communications devices

( ) **2.** A _____ in a table represents a relationship among a set of values.

A. Column

B. Key

C. Row

D. Entry

( ) **3.** Multiprogramming systems _____.

A. Are easier to develop than single programming systems

B. Execute each job faster

C. Execute more jobs in the same time

D. Are used only on large main frame computers

( ) **4.** Which of the following data structure is nonlinear type?

A. List

B. String

C. Stack

D. None of the above

( ) **5.** When a computer sends data over the Internet, the data is divided into small pieces, or ____.

A. Bundles

B. Slices

C. Packets

D. Baskets

( ) **6.** For each attribute of a relation, there is a set of permitted values, called the _____ of that attribute.

A. Domain

B. Relation

C. Set

D. Schema

( ) **7.** Switching the CPU to another Process requires to save state of the old process and loading new process state is called as _____.

A. Process Blocking

B. Context Switch

C. Time Sharing

D. None of the above

( ) **8.** The logical expression $(w + x)(y + z)$ is a _____ standard form.

A. Sum of products

B. Product of sums

C. Sum terms

D. Product terms

( ) **9.** Which number should come next in this series 10, 17, 26, 37,?

A. 46

B. 52

C. 50

D. 56

( ) **10.** When base is derived by derived-class, derived-class members has no access to base's _____.

A. Members

B. Private members

C. Protected members

D. Function

( ) **11.** The situation when in a linked list HEAD=NULL is

A. Underflow

B. Overflow

C. Empty List

D. None Empty List

( ) **12.** What does router do in a network?

A. Forwards a packet to all outgoing links

B. Determines on which outing link a packet is to be forwarded

C. Forwards a packet to the next free outgoing link

D. Forwards a packet to all outgoing links except the originated link

( ) **13.** Digital scanner is a:

A. Vector input device

B. Vector input and output device

C. Raster input device

D. Raster input & output device

( ) **14.** Which of the following is true of interception?

A. It is aimed at preventing the capture of data and information being transmitted across a network.

B. It is focused on preventing outside persons or systems from accessing internal systems.

C. It prevents virus intrusion into an internal network via email.

D. All of the above.

( ) **15.** Which of the following correctly declares an array?

A. int array[10];

B. int array;

C. array{10};

D. array array[10];

( ) **16.** What is the other name of backward state-space search?

A. Regression planning

B. Progression planning

C. State planning

D. Test planning

( ) **17.** The main disadvantage of _____ is that the hit ratio can drop considerably if two or more words whose addresses have the same index but different tags are accessed repeatedly.

A. Direct mapping

B. Associative mapping

C. Set- associative mapping

D. Sequential mapping

( ) **18.** The operation of processing each element in the list is known as_____.

A. Sorting

B. Merging

C. Inserting

D. Traversal

( ) **19.** Assume that x is defined as a class, then you can declare_____ of class x.

A. One object

B. A number of objects

C. an array of objects

D. All of the above

( ) **20.** Which one of the following connects high-speed high-bandwidth device to memory subsystem and CPU.

A. Expansion bus

B. PCI bus

C. SCSI bus

D. None of the above

Q3: Within computer science discipline, write down **(<u>in the blank entries</u>)** full names of the following short. **(10 Marks)**

1	**NFS**	
2	**DES**	
3	**Dpi**	
4	**CD**	
5	**DHTML**	
6	**GSM**	
7	**IC**	
8	**JIT**	
9	**RDM**	
10	**USB**	

Q4: Answer the following: (10 Marks)

1. What are the five major activities of an operating system in regard to process management?

Answer:

2. How does IOP interrupt the CPU?

Answer:

3. Convert the expression ((A + B) * C - (D - E) ^ (F + G)) to equivalent Prefix notation.

Answer:

4. What is a product cipher?

Answer:

5. What does Subnetting mean?

Answer:

Q5: Numerical Answer (8 Marks)

1. Which number should replace the question mark?

2	4	6
6	8	10
10	12	?

Answer:

2. What is the address size of IPv6?

Answer:

3. Point $(x = 3, y = 4, z = 5)$ was passed through scaling $(Sx = 4, Sy = 3, Sz = 2)$ and translation $(-2, -2, 0)$. Write the new position of x, y and z.

Answer:

4. How many blocks can the cache accommodate if a digital computer has a memory unit of $128kb \times 16$, a cache memory of $32kb$ words and the direct mapping with a block size of 4 words.

Answer:

Q6: What will be the output of the following code segments? **(12 Marks)**

(A)

```
class abc {
 public:  abc ( )
 { cout << "start ";
 }
 ~abc (  )
 {
    cout <<"end "; }
 } ;
 main ( )
 {
  abc  a ;
  abc  b ;
 }
```

Output:

(B)

```
 int main ()
{
   int n;
   for (n = 5; n > 0; n--)
   {
      cout << n;
      if (n == 3)
         break;
   }
   return 0;
}
```

Output:

(C)

```
int main ()
{
   int array[] = {0, 2, 4, 6, 7, 5, 3};
   int n, result = 0;
   for (n = 0 ;n < 8 ;n++) {
      result += array[n];
   }
   cout << result;
   return 0;
}
```

Output: