الأسم الكامل:

University of Baghdad
College of Science
Department of Computer Science
High Diploma Qualification Exam
Date: 22 June 2017
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 (Number)	Mark (Word)
Q1		
Q2		
Q3		
Total		
Out of	100	

Q1	**Answer with either <u>True</u> or <u>False</u>. (30 Marks)** **Do not use T, ✓, F, or ×. Use only True and False to represent your answers.**	**Answer**
1.	Encoder is a digital function that produce a reverse operation for that of a decoder.	
2.	The firewall can protect against attacks that pass throw the firewall.	
3.	A call to function cannot be used in control expression for a loop or decision statement.	
4.	A compiler is a program that reads a program written in assembly language and translates into machine code.	
5.	In an application program, to set line-type attributes the following statement is used: SETLINE( ).	
6.	void funct(int) { cout<<"Exam."; } is a validC++ function definition.	
7.	Binary logic consists of binary variables and logic operation. The variables are designated by letters e.g. A, B, C, r, w, x, y with only two distinct values: 1 and 0. The basic logical operators are AND, OR and NOT.	
8.	Related fields in a database are grouped to form a data file.	
9.	$\exists x$ *like*$(X, food)$ is skolemed to *like (f(Y), X).*	
10.	A relational database consists of a collection of records.	
11.	Relocatable programs can be loaded only at one specific location.	
12.	Throughput of a system is number of programs processed by it per unit time.	
13.	Smallest size object that can be displayed on a monitor is called point.	
14.	DNS is widely used to support resolving host names to IP addresses.	
15.	A microprogram sequencer in Pentium MP generates the micro instruction for the next instruction to be executed.	
16.	Message modification is one of the major types of passive attack.	
17.	The conceptual model is independent on hardware and software.	
18.	Crossover cable would be used to make the connection between the console port of a router and a workstation.	
19.	Input to code generator consists of intermediate code together with symbol table information.	
20.	Breadth-first search algorithm may get quickly into a deep search space.	
21.	The constructor must return a value.	

22.	In computers, subtraction is carried out generally by 1's complement.	
23.	A critical section is a program segment where shared resources are accessed**.**	
24.	Memory unit accessed by content is called BIOS.	
25.	The worms are spread from machine to machine across networks and need host program to replicate.	
26.	A binary tree that is not empty always contain other binary tree.	
27.	It is the network responsibility to forward packets reliably from the source to the destination.	
28.	Julius Caesar introduced the concept of public key cryptography.	
29.	Symmetric encryption algorithms use a single key to encrypt and decrypt.	
30.	The distance from one pixel to the next pixel is called resolution.	

Q2	**Choose the correct answer.** (30 Marks) **Use only A, B, C, and D to represent your correct choice.**	**Answer**
1.	A page fault means that we referenced a page **A.** outside the memory boundaries **B.** with an incorrect I/O request **C.** that was not in secondary storage **D.** that was not in main memory	
2.	Root node in a graph is a node with **A.** no children **B.** multi-children **C.** two children **D.** no parent	
3.	Cryptography provides each of the following types of protection except _____. **A.** confidentiality **B.** speed **C.** integrity **D.** authentication	
4.	The term _____ means the ability to take many forms. **A.** inheritance **B.** polymorphism **C.** member function **D.** encapsulation	
5.	ODBC stands for **A.** Object Database Connectivity **B.** Oral Database Connectivity. **C.** Oracle Database Connectivity **D.** Open Database Connectivity.	
6.	DES is a(n) _____ method adopted by the U.S. government. **A.** symmetric-key **B.** asymmetric-key **C.** either (A) or (B) **D.** neither (A) nor (B)	
7.	The relation {(1,2),(1,3),(3,1),(1,1),(3,3),(3,2),(1,4),(4,2),(3,4)}is **A.** reflexive **B.** transitive **C.** symmetric **D.** asymmetric	
8.	Key to represent relationship between tables is called **A.** primary key **B.** secondary key **C.** foreign Key **D.** None of these	
9.	The Playfair cipher uses a matrix of size **A.** 4 x 4 **B.** 5 x 5 **C.** 6 x 6 **D.** 7 x 7	
10.	Step 2 in clause normal form steps is **A.** eliminate $\rightarrow$ **B.** skolemization process **C.** reduce the scope of negation **D.** rename variable	
11.	Interval between the time of submission and completion of the job is called **A.** waiting time **B.** turnaround time **C.** throughput **D.** response time	
12.	Two detecting methods for Intrusion Detecting System (IDS) **A.** application based and network based **B.** signature based and anomaly based **C.** false positive and false negative **D.** host based and network based	
13.	Which of the following is not an OOP feature in C++? **A.** encapsulation **B.** abstraction **C.** polymorphism **D.** exceptions	
14.	A graph G is called a ..... if it is a connected acyclic graph **A.** cyclic graph **B.** regular graph **C.** tree **D.** not a graph	

15.	LR parser is one of the _____parse method. **A.** top-down **B.** bottom-up **C.** both A and B **D.** regular	
16.	What is one advantage of defining network communication by the seven layers of the OSI model? **A.** It increases the bandwidth of a network. **B.** It makes networking easier to learn and understand. **C.** It eliminates many protocol restrictions. **D.** It increases the throughput of a network.	
17.	Advanced Encryption Standard (AES), has three different configurations with respect to number of rounds and **A.** data size **B.** round size **C.** key size **D.** encryption size	
18.	An assembler is **A.** programming language dependent. **B.** syntax dependent. **C.** machine dependent. **D.** data dependent.	
19.	A packet filter firewall filters at the **A.** application or transport **B.** data link layer **C.** physical **D.** network layer	
20.	Which of the following is most likely to make your computer stop working? **A.** Trojan **B.** worm **C.** virus **D.** spyware	
21.	Which of the following is a legal expression in SQL? **A.** select null from employee; **B.** select name from employee; **C.** select name from employee where salary = null; **D.** none of these	
22.	Graphics software acts as a very powerful tool to create? **A.** images **B.** animated pictures **C.** both a and b **D.** system interface	
23.	What is the term used to describe the transport layer protocol data unit? **A.** bits **B.** packets **C.** segments **D.** frames	
24.	A data manipulation command that combines the records from one or more tables is called **A.** select **B.** project **C.** join **D.** product	
25.	Virtual memory is **A.** simple to implement **B.** used in all major commercial operating systems **C.** less efficient in utilization of memory **D.** useful when fast I/O devices are not available	
26.	_____is with minimum latency time in memory hierarchy. **A.** registers **B.** main memory **C.** cache memory **D.** secondary Storage	

27.	In an Ethernet LAN, how does the NIC know when it can transmit data? **A.** an Ethernet NIC transmits data as soon as the frame is received. **B.** an Ethernet NIC transmits data as soon as the NIC receives a token. **C.** an Ethernet NIC transmits data when it senses a collision. **D.** an Ethernet NIC transmits data after listening for the absence of a signal on the media.	
28.	The basic principle of Bresenham`s line algorithm is **A.** to select the optimum raster locations to represent a straight line **B.** to select either x or y, whichever is larger, is chosen as one raster unit **C.** we find on which side of the line the midpoint lies **D.** both A and B	
29.	How many usable hosts are available given a Class C IP address with the default subnet mask? **A.** 254 **B.** 255 **C.** 256 **D.** 510	
30.	In an undirected graph the number of nodes with odd degree must be **A.** zero **B.** odd **C.** prime **D.** even	

Q3. Answer each of the following (40 Marks)

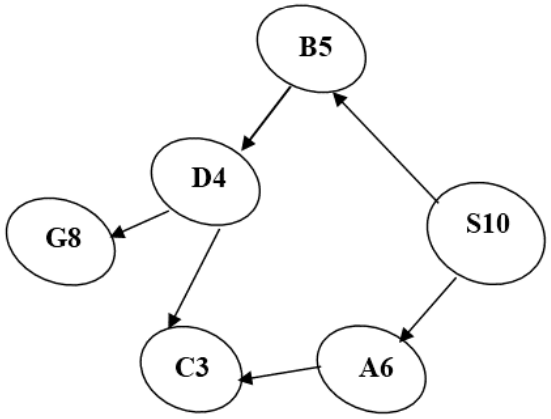
1. Compare pre-emptive and non-preemptive scheduling policies. **(6 Marks)**

Solution:

2. What are the four fundamental goals of cryptography? (4 Marks)

Solution:

3. **Use hill-climbing algorithm with heuristic minimization strategy to retune the path from S to G (as shown in the figure below). If no path found, then state why. (8 Marks)**



4. Define the terms Unicasting, Multicasting and Broadcasting (6 Marks)
Solution:

5. What is Aspect Ratio? (4 Marks)
Solution:

6. Is it legal to write such declarations in one program? Explain (4 Marks)

```
class ab{public: void test();};
class xy{public: void test();};
```

Solution:

7. Write a function to find the maximum value in any row of 5×5 array. (8 Marks)