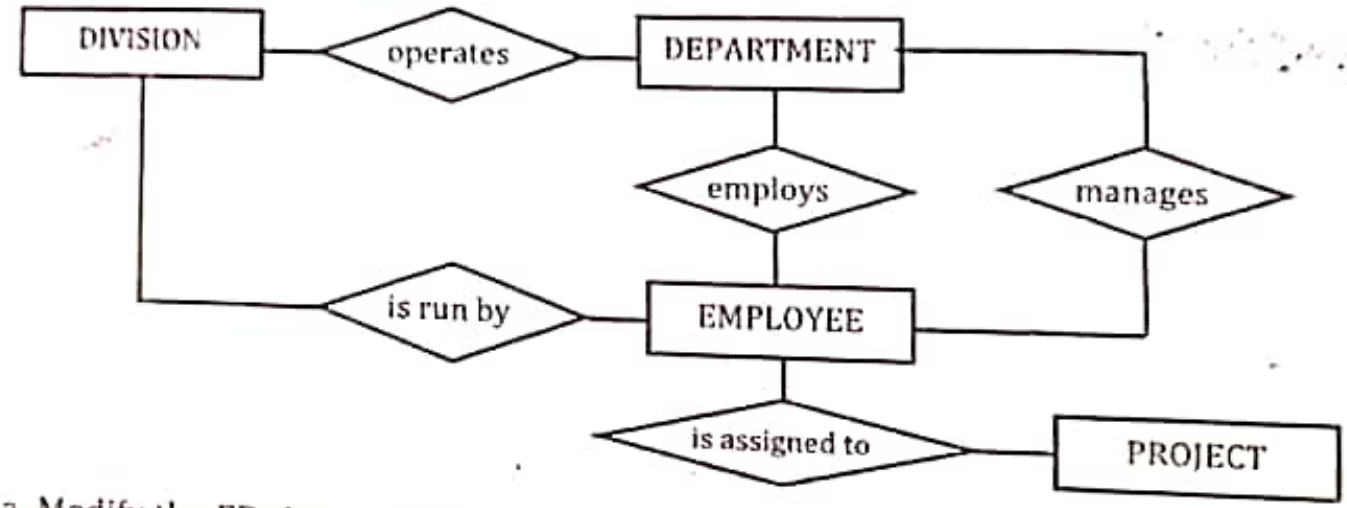
Answer the Following Two Questions:

Question One (34 Marks)

Given the following ER-diagram:



a. Modify the ER-diagram showing the cardinality and participation constraints according to the following rules: (12 Marks)

- A department employs many employees, but each employee

Consider the following relations for a database that keeps track of car sales in a car dealership:

CAR(Serial_No, Model, Manufacturer, Price)

OPTIONS(Serial_No, Option_Name, Price)

SALES(Salesperson_id, Serial_No, Date, Sale_price)

SALESPERSON(Salesperson_id, Name, Phone)

a. Specify the foreign keys for the above schema. (3 Marks)

b. Specify the following queries in relational algebra: (9 Marks)

   i. Give the identification number and phone of the person sold a car with price more than 200,000 pounds.

   ii. List the models of cars have prices between 50,000 and 100,000 pounds.

   iii. List the serial number and model of cars that manufactured by TOYOTA or NISSAN.

c. Repeat part (b) using SQL (9 Marks)

d. Assuming that the database is populated with data perform the following update operations using SQL: (12 Marks)

   i. Delete the options that have a price more than 200 LE.

   ii. For the sales person name 'AAAAA' modify the phone number to 01111111111.

   iii. Add a car with serial number: 'sa344444', model: SUNNY, manufacturer: NISSAN, and price 120,000.

   iv. Delete the option table.

e. Explain if the previous update operations violate the integrity constraints (key, entity integrity, or referential integrity): (8 Marks)

Best Wishes

Dr. Mohammed Badawy

FACULTY OF ELECTRONIC ENG.
Computer Science and Eng. Dept.
Third Year
1ST Term Final Exam.
Date: 10/1/2016

Computer and Information Security
Time: 3 Hours
Total Marks: 70
Examiner: Dr. M. Badawy

Answer the Following Questions:

Question One (25 Marks)

a) Define confidentiality, integrity, and availability
b) Explain briefly three classes of threats
c) Compare policy and mechanism
d) Define the types of security policies
e) Define the types of access control
f) Describe the Clark-Wilson integrity model

Question two (25 Marks)

a) Define the cryptosystem tuples
b) Describe the data encryption standard (DES) operation
c) Given the character frequencies; decipher the following ciphertext which was enciphered using the Caesar cipher: FS IFXD ICFR

a	0.080	h	0.060	n	0.070	t	0.090
b	0.015	i	0.065	o	0.080	u	0.030
c	0.030	j	0.005	p	0.020	v	0.010
d	0.040	k	0.005	q	0.002	w	0.015
e	0.130	l	0.035	r	0.065	x	0.005
f	0.020	m	0.030	s	0.060	y	0.020
g	0.015					z	0.002

Note the correlation of frequency of letters is $\varphi(i) = \Sigma_{0 \le c \le 25} f(c)p(c - i)$

d) Using p = 3 and q = 11 and e <10
   I. Apply RSA algorithm to encrypt and decrypt the message: "HIGH EDGE" for confidentiality purposes
   II. Repeat for integrity purposes

Question three (20 Marks)

a) Define Interchange key and session key
b) Describe the **Kerberos** key exchange
c) Define stream and block Ciphers
d) Determine the key stream produced by NonLinear Feedback Shift Register if $r=1010$ and $f(r_0 \ldots r_{n-1}) = (r_0 | r_2) \oplus r_3$

انتهت الاسئلة

تمنياتي لكم بالتوفيق والنجاح

د/محمد بدوى

Menofia University

Faculty of Electronic Eng

Computer Science and Eng.Dep

3rd Year – 1st Semister

الامتحان أربع صفحات

Mid-Term Exam

Subject: Computer Graphics

Date : 9/ 12/ 2014

Allowed Time : 1 Hour

الزمن ساعة !

sec

(1) - A): Distinguish between Raster and Vector graphics .

-B) : Illustrates crucial steps that are needed in order to generate an image from areal or virtual scene .

-C) : Define and explain true colour and pseudo code colour .

Menofia University

Faculty of Electronic Eng

Computer Science and Eng.Dep

3rd Year – 1st Semister

الوقت : أربع ساعات

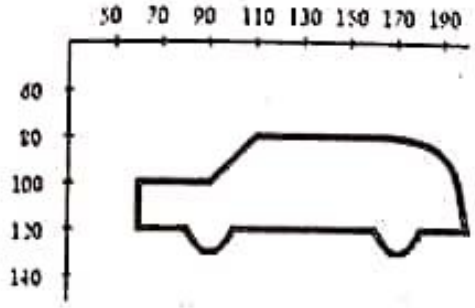
Mid-Term Exam

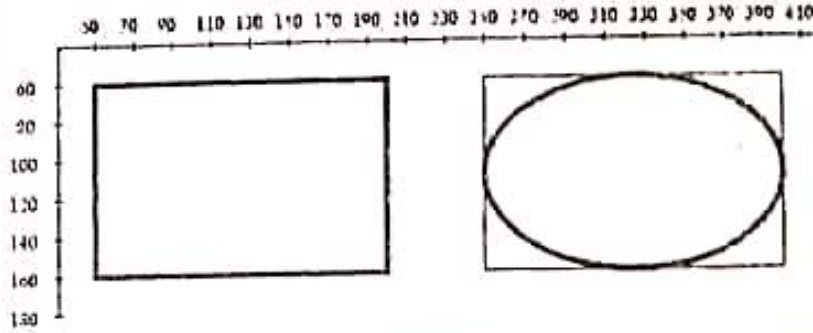
Subject: Computer Graphics

Date : 9/ 12/ 2014

Allowed Time : 1 Hour

(2) Using Java Applet package to write aprogram to display the following shapping .





Menoufia University, Faculty of Electronic Engineering,
Computer Science & Engineering Department.
Third Year- Second Semester
Elective Course IV (Advanced Digital Design) (CSE 327)
Examiner: Dr. Sabah Eldin Shaban

Mid Term Exam
Date: 14/04/2016
Time: One Hour
Total Mark: 20 Marks
Three Questions in Three Pages

اسم الطالب:	الرقم الجامعي:	الفصل:

Answer All the Following Questions

First Question — 15 Min/5 Marks

With a guarded block principle, complete the following **VHDL** model of a positive-edge sensitive D-type flip-flop, with synchronous reset.

```
LIBRARY ieee;
USE ieee.std_logic_1164.all;
ENTITY dff IS
   PORT (d, clk, rst: IN STD_LOGIC; q: OUT STD_LOGIC);
END dff;
```

Consider a combinational digital circuit that has *three binary inputs* **x, y, z** and a *binary output* **f (x, y, z) = Σ (0, 2, 4, 6, 7).**

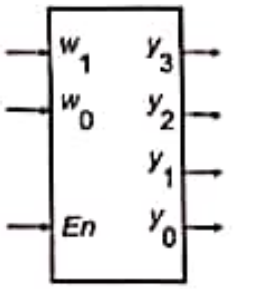
1. Design the circuit using a **PLA.**

2. Show the related function generator in a truth table and a look-up table form.

Based on the following truth table and a graphical symbol, write a synthesizable code of 2-to-4 decoder using **WITH/SELECT/WHEN** statement.

En	w_1	w_0	y_3	y_2	y_1	y_0
1	0	0	0	0	0	1
1	0	1	0	0	1	0
1	1	0	0	1	0	0
1	1	1	1	0	0	0
0	x	x	0	0	0	0

(a) Truth table



(b) Graphical symbol

```
LIBRARY ieee;
USE ieee.std_logic_1164.all;
```

Answers *all* from following questions [70 Marks]

I) State True or False for each statement and **correct the false one**. [15 Marks]

1- The field motion and manipulation is closely related to AI.

2- There are many ways to represent the knowledge that used in AI.

3- AI can be used in mathematics.

4- One uses of AI in natural language is dialog systems.

5- A problem space consists of a set of states of a problem and a set of operators that change the state.

6- A heuristic is often called a rule of thumb.

7- The heuristic function only estimates the path cost from a node to a solution.

8- An IDA* search is a series of depth first searches where the depth is increased after each iteration.

9- A uniform path cost search required exponential storage spaces.

10- A problem with A* search is that it must keep all states in its memory.

10- It is often [easy, normal, difficult] to apply a bidirectional search.

11- The knowledge must be [stored, used, explained] in a way that makes it possible for AI to search it, and if necessary, infer new knowledge from it.

12- In semantic networks, the [squares, rectangles, circle] in the network represent objects, and the ares represent relationships.

13- Semantic networks can also be formed in a variety of ways, with varying types of [relationships, objects, goals].

14- The power of propositional logic comes into play using the [action, conditional, normal] forms.

15- While propositional logic is useful, it cannot represent general-purpose logic in a [actual, compact, practical] way.

III) Complete the following sentences with suitable word. [10 Marks]

1- Machine perception is the ability to use …….. from sensors to deduce aspects of the world.

2- A ……consists of a problem space, an initial state, and a set of goal states.

3- The root of the problem space represents the start state, and the search proceeds towards a goal state. It is called ……. search.

4- …. is the path cost function and ….. is the heuristic function. (true or false).

5- The products of AI will appear as …….. .

6- Any problem may have ……. goal states.

7-The path cost of a solution is calculated as the …….. of the costs of the actions which led to that solution.

8- An IDA* search needs ..... storage requirement.

9- KR is the theory and practice of representing .....for computer systems.

10- .....knowledge is expressed as the knowledge of achieving some goal.

[15 Marks]

IV) Write the FOL for the following sentences

1. Ali is a professor

2. All professors are people.

3. Samir is the dean.

4. If it is humid, then it is hot

5- If it is hot and humid, then it is raining

[15 Marks]

IIV) For the following table calculate the entropy.

Model	Engine	SC/Turbo	Weight	Fuel Eco	Fast
Prius	small	no	average	good	no
Civic	small	no	light	average	no
WRX STI	small	yes	average	bad	yes
M3	medium	no	heavy	bad	yes
RS4	large	no	average	bad	yes
GTI	medium	no	light	bad	no
XJR	large	yes	heavy	bad	no
S500	large	no	heavy	bad	no
911	medium	yes	light	bad	yes
Corvette	large	no	average	bad	yes
Insight	small	no	light	good	no
RSX	small	no	average	average	no
IS350	medium	no	heavy	bad	no
MR2	small	yes	average	average	no
E320	medium	no	heavy	bad	no

With my best wishes

Dr. Eng. Ahmed M. Elmahalawy

11- Procedural knowledge is commonly represented using productions, and is very easy to use but difficult to manipulate.

12- Declarative knowledge can be represented as logic and is simpler to manipulate.

13- Frames follow a more object-oriented abstraction with greater structure.

14- Descriptive knowledge is expressed as factual knowledge.

15- Semantic networks are a useful way to describe relationships between a numbers of objects.

II) Choose the correct answers. [15 Marks]

1- AI is the science of making machines that: (think and act, eat and drink, thank and act) like human.

2- One of the problem of simulating intelligence is (producing, creation, deduction) the problem.

3- AI is widely used in (mobile, robotic, playing).

4- You can use AI in (academic only, research and industry, manufacturing only).

5- AI technique is a method that exploits (information, knowledge, idea)

6- The goal could be stated (implicitly, explicitly, explicitly or implicitly) by giving a rule of determining when the goal has been reached.

7- Memory is a [small, medium, big] problem for breadth first search.

8- The deep first search needs [low, medium, large] storage requirement.

9- Iterative Deepening Search only requires the same memory as [depth, breadth, both] first search.

أجب عن الأسئلة التالية: الجزء الأول: (أخلاقيات المهنة) Total mark [35]

(١) صح أم خطأ:

١. المنظمات الهندسية من دورها التعاون مع الجهات الرسمية المختصة وتقديم المشورة والنصيحة.
٢. يجب على المهندس أن يعامل من يتفقون معه دينيا وثقافيا فقط بطريقة كريمة ونبيلة.
٣. يجب على المهندس أن يعمل بعيدا عن الرؤى القومية والسياسات العامة.
٤. ليس من واجبات المهندس حماية سلامة وصحة الأفراد والجماعات والحفاظ على الممتلكات.
٥. يجوز للمهندس التمييز بين المتعاملين معه على أساس الأصل أو الدين أو الجنس أو اللون أو السن أو الإعاقة.
٦. يجب على المهندس الذي يعمل في خارج دولته أن يتفرد بعلمه وخبرته ولا ينشرها للمهندسين المحليين.
٧. يجب على المهندس المساهمة في نشاطات الجمعيات الهندسية العلمية والمهنية ومساندتها في تحقيق أهدافها.
٨. يجب على المهندس التركيز في عمله فقط و عدم الالتفات للأنشطة الإجتماعية و الجمعيات الهندسية العلمية.
٩. يجب على المهندس اذا رأى زميل له يقوم بممارسات لا تتفق مع اخلاقيات المهنة ان ينصحه فقط.
١٠. يجب على كل مهندس الإنفراد بما يعرفه من معلومات دون مساعدة زملائه المهندسين.
١١. يجب على المهندس الإقرار بالإسهامات المهنية لرؤسائه ومرؤوسيه وزملائه، وأن يكونوا دائما موضع احترامه وتقديره.
١٢. يجب على المهندس اتباع مبدأ الغاية تبرر الوسيلة في حالة وجود تنافس مع زملائه.
١٣. يمكن للمهندس أن يقبل التعاقد على مشروع تم التعاقد عليه مع مهندس آخر ولكنه لم يكتمل أو لم يتم دفع أتعاب عليه.
١٤. يمكن للمهندس الذي يعمل في مؤسسة أن يتركها دون سابق إنذار أو توضيح للأسباب.
١٥. يمكن للمهندس صاحب العمل أن يمتنع عن منح المهندسين الذين انتهت مدة خدمتهم لديه خطابا يفيد ما قاموا به من أعمال.
١٦. يمكن للمهندس القيام بالأعمال وإن كانت في غير تخصصه من أجل إعلاء مهنة الهندسة وتعريف المجتمع بأهميتها.
١٧. يمكن للمهندس قبول هدايا أو مكافآت مالية غير أجره المحدد في عقود الأعمال المتعاقد عليها.
١٨. لا يجوز للمهندس الاعتراف بأخطائه ولكن يقوم بتحريف أو إخفاء الحقائق لتبريرها أو التغطية عليها.

(٢) ماذا تفعل في المواقف التالية:

١. في حالة الرغبة في ترك المؤسسه التي تعمل بها.
٢. إذا ما أسند إليك عمل يعتبر تعديلا أو تطويرا كليا أو جزئيا لعمل مهندس آخر.
٣. في حالة قيام زميل بممارسات لا تتفق مع آداب وأخلاقيات المهنة الهندسية أو بعدم الالتزام بالقوانين واللوائح المنظمة لهذه المهنة.

(٣) ما هو حق الملكية الفكرية الدائم الذي لا يجوز لأحد انتهاكه أبدا؟ اذكر مثالا شائعا على انتهاك الملكية الفكرية.

من فضلك اقلب الورقة ←

Menoufia University, Faculty of Electronic Engineering,
Computer Science & Engineering Department.
Third Year- First Semester
Elective Course I (Computer Peripherals) (CSE 315)
Examiner: Dr. Salah Eldin Shaban

Final Term Exam
Exam Date: 06/01/2016
Allowed Time: Three Hours
Total Mark: 70 Marks
No. of Pages: Two

Note: The student can get a copy of the PIC18F452 microcontroller data sheet during exam.

Answer All the Following Five Questions

First Question — *25 Min/10 Marks*

In the current sourcing mode, one LED device is connected to BIT3 of PORT C of a PIC18F452 that is operated from a 4MHz resonator. When power is applied to the microcontroller (or when it is reset), design the hardware interface, list the PDL, and write a mikroC code to flash the LED *ten times* with 2.5 second intervals. An external reset push button is connected to the MCLR.

Second Question — *25 Min/10 Marks*

Design the hardware interface, list the PDL, and write a mikroC code to count and repeat numbers from 3 to 9 on a common cathode 7-segment display connected to PORT C of a PIC18F452 microcontroller. Flash each displayed number *two times* with 0.8 second delay intervals.

Third Question — *45 Min/17 Marks*

Design the hardware interface, list the PDL, and write a mikroC code for a digital voltmeter that can be used to measure voltages between 0 and +5V. The voltage to be measured is applied to channel 0 of a PIC18F452 microcontroller A/D converter. Firstly, the text "VOLTMETER" is displayed for two seconds on a two-row text-based HD44780 LCD which is connected to PORTC as in the default four-wire connection. Then, every second, the microcontroller reads the analog voltage, converts it to digital, formats it, and then displays it on the LCD. A potentiometer is used to adjust the contrast of the LCD. An external reset push button is connected to the MCLR input. For more accurate result, the digital value is scaled before it is displayed, as follows: Multiply the value by a factor to remove the integer division. Calculate the integer part of the result by dividing the number into 100, and then the fractional part can be calculated as the remainder. The integer part and the fractional part can be displayed with a decimal point in between. Use the mikroC built-in library functions.

Fourth Question — *45 Min/18 Marks*

Design the hardware interface, list the PDL, and write a mikroC code for a simple integer calculator that is based on the RS232 standard. The calculator is designed to add, subtract, multiply, and divide integer numbers. A PC is connected to a PIC18F452 microcontroller with a 4MHz resonator using an RS232 cable and a built-in USART is used for serial communication. The serial communication lines of the microcontroller (RC6 and RC7) are connected to a MAX232 voltage translator chip and then to the serial input port (COM1) of the PC using a 9-pin connector.

List the PDL and write a mikroC code as a main program and two functions. One function that called *Newline* sends a carriage-return and line-feed to the serial port. The other function that called *Text_To_Usart* sends a text message to USART. The main program receives two numbers and the operation to be performed from the PC keyboard and displays them on the PC monitor. The result of the operation is also displayed on the monitor. Use the mikroC built-in library functions.

P. T. O.

Fifth Question — 40 Min/15 Marks

For a PIC18F452-based system, two common cathode 7-segment displays are connected to the microcontroller with 2 MHz oscillator. One display is connected to PORT B and another one is connected to PORT C. Design the hardware interface, list the PDL, and write a mikroC code that increments the contents of PORT B with 0.85 second interval times using TMR0 interrupts, and increments the contents of PORT C with 0.45 second interval times using TMR1 interrupts.

With My Best Wishes

The mikroC built-in Functions:

Function	Description
Lo	Returns the lowest byte of a number (bits 0 to 7)
Hi	Returns next to the lowest byte of a number (bits 8 to 15)
Higher	Returns next to the highest byte of a number (bits 16 to 23)
Highest	Returns the highest byte of a number (bits 24 to 31)
Delay_us	Creates software delay in microsecond units
Delay_ms	Creates constant software delay in millisecond units
Vdelay_ms	Creates delay in milliseconds using program variables
Delay_Cyc	Creates delay based on microcontroller clock
Clock_Khz	Returns microcontroller clock in KHz
Clock_Mhz	Returns microcontroller clock in MHz

LCD Commands:

LCD command	Description
LCD_CLEAR	Clear display
LCD_RETURN_HOME	Return cursor to home position
LCD_FIRST_ROW	Move cursor to first row
LCD_SECOND_ROW	Move cursor to second row
LCD_THIRD_ROW	Move cursor to third row
LCD_FOURTH_ROW	Move cursor to fourth row
LCD_BLINK_CURSOR_ON	Blink cursor
LCD_TURN_ON	Turn display on
LCD_TURN_OFF	Turn display off
LCD_MOVE_CURSOR_LEFT	Move cursor left
LCD_MOVE_CURSOR_RIGHT	Move cursor right
LCD_SHIFT_LEFT	Shift display left
LCD_SHIFT_RIGHT	Shift display right

Functions of 4-bit-interface text-based LCDs:

Lcd_Config (), **Lcd_Init ()**,
Lcd_Out (*row, column, text*),
Lcd_Out_Cp (*text*),
Lcd_Chr (*row, column, character*),
Lcd_Chr_Cp (*character*), and
Lcd_Cmd (*LCD command*)

The Pin Configuration of the HD44780 LCD:

Pin no.	Name	Function
1	V_{SS}	Ground
2	V_{DD}	+ve supply
3	V_{EE}	Contrast
4	RS	Register select
5	R/W	Read/write
6	EN	Enable
7	D0	Data bit 0
8	D1	Data bit 1
9	D2	Data bit 2
10	D3	Data bit 3
11	D4	Data bit 4
12	D5	Data bit 5
13	D6	Data bit 6
14	D7	Data bit 7

The Software UART Functions:

Soft_Uart_Init (*port, rx pin, tx pin, baud rate, mode*)
Soft_Uart_Read (*&error*), and
Soft_Uart_Write (*data*)

The Hardware UART Functions:

Uart_Init (*baud rate*),
Uart_Data_Ready (),
Uart_Read (), and **Uart_Write** (*data*)

Answer All the Following Five Questions

First Question

Multiple Choice Questions. ***Circle the correct answer.***

1. FPGA devices use ..... to implement Boolean logic functionality.
   A. Physical gates.
   B. Function generators.
   C. Peripherals.
   D. A and B
2. A ..... is a combination of a look up table and a D-FF.
   A. Logic block.
   B. SRAM.
   C. Logic cell.
   D. A or C.
3. ..... usually do not have physical significance in a circuit.
   A. Variables.
   B. Signals.
   C. Constants.
   D. All of the above.
4. A VHDL ..... is a file containing definitions of objects that can be used in other codes.
   A. Library.
   B. Package.
   C. Entity.
   D. Component.
5. Which of these is a valid identifier in VHDL code?
   A. _c1
   B. c_10
   C. process
   D. 1d
6. The block of code which defines the relationship between input, output and internal signals or variables in a VHDL design is the .....
   A. Architecture
   B. Entity
   C. Package
   D. Library
7. In VHDL, the mode of a port does not define:
   A. An input.
   B. An output.
   C. Both an input and an output.
   D. The TYPE of the bit.

P.T.O.

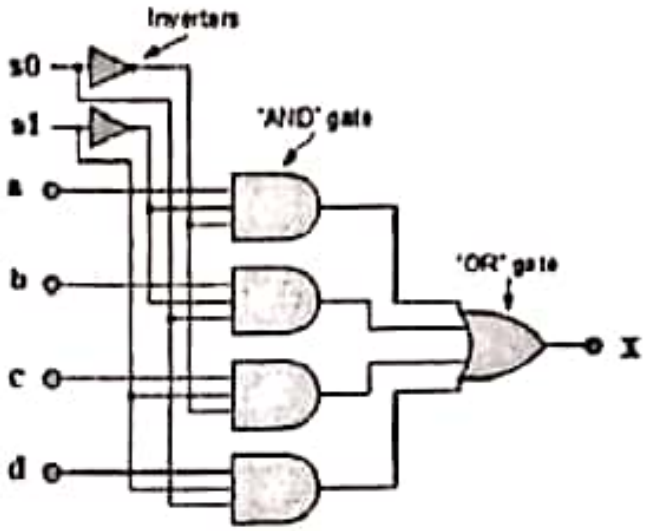
8. How many architectures can be associated with an entity?
   A. Only one
   B. Three
   C. More than one
   D. None
9. Which VHDL data type can only have a value of '1' or '0'?
   A. Signal
   B. Std_logic
   C. Bit
   D. Integer
10. The record data type comprises the elements of ..... data types.
   A. Same
   B. Different
   C. Both A and B
   D. None of the above
11. In VHDL, which class of scalar data type represents the values necessary for a specific operation?
   A. Integer types
   B. Real types
   C. Physical types
   D. Enumerated types
12. In VHDL, ... data type is not synthesizable and allows the designer to model the objects of dynamic nature.
   A. Scalar
   B. Access
   C. Composite
   D. File
13. In VHDL, which object(s) is (are) used to connect entities together for the model formation?
   A. Constant
   B. Variable
   C. Signal
   D. All of the above
14. Among the VHDL features, which language statements are executed at the same time in parallel flow?
   A. Concurrent
   B. Sequential
   C. Net-list
   D. Test-bench
15. What is the symbol used for signal assignment?
   A. =
   B. :=
   C. <=
   D. =>
16. Where should you define the signal clock in a process?
   A. Process declaration
   B. List of sequential statement
   C. Sensitivity list
   D. Nowhere

17. Which statement is used to terminate the current loop iteration and proceed on the next iteration?
    A. Exit
    B. Next
    C. Continue
    D. All of the above
18. Which is an invalid form of wait?
    A. wait until time expression
    B. wait on signal
    C. wait for condition
    D. both A and C
19. The ..... enumerated data type includes logic values that allow designers to accurately simulate or synthesis such circuits conditions as unknowns and high-impedance states.
    A. std_logic
    B. std_unlogic
    C. bit_vector
    D. Either A or B
20. In VHDL, ... which are locally declared and immediately updated, are only used in sequential code.
    A. Constants
    B. Variables
    C. Signals
    D. Generics
21. In VHDL, a ..... defines behavior by describing how components are connected.
    A. Structural code.
    B. Dataflow code.
    C. Sequential code.
    D. None of these
22. What cannot be defined within process units?
    A. Signal
    B. Variables
    C. Constants
    D. Functions
23. In conditional output box of ASMs, if a signal does not have a value assigned to it that signal is .....
    A. asserted during the state and is de-asserted elsewhere.
    B. de-asserted during the state and is asserted elsewhere.
    C. deleted during the state and is asserted elsewhere.
    D. asserted during the state and is deleted elsewhere.
24. The following code is the process for the .....
    A. T-flip flop
    B. D-flip flop
    C. Latch
    D. None of the above

```
FF_PROCESS: process (CLK, CLEAR)
begin
 if (CLEAR = '1') then Q <= '0';
      elsif (CLK'event and CLK = '1') then Q <= D;
 end if;
end process;
```

(a) Consider the following entity declaration and logic implementation of 4 x 1 multiplexer. Assume that each input is multiplexed after 10 nanoseconds. *(9 Marks)*

```
ENTITY mux IS
  PORT (a, b, c, d:   IN BIT;
        s0, s1:  IN BIT;
        x: OUT BIT);
END mux
```



For that multiplexer:

1) Write a complete *concurrent* VHDL architecture code using **when ... else** statement.
2) Write a complete *sequential* VHDL architecture code using **if ... then** statement.
3) Write a complete *structural* VHDL architecture code using logic components.

A complete *concurrent* architecture code is:

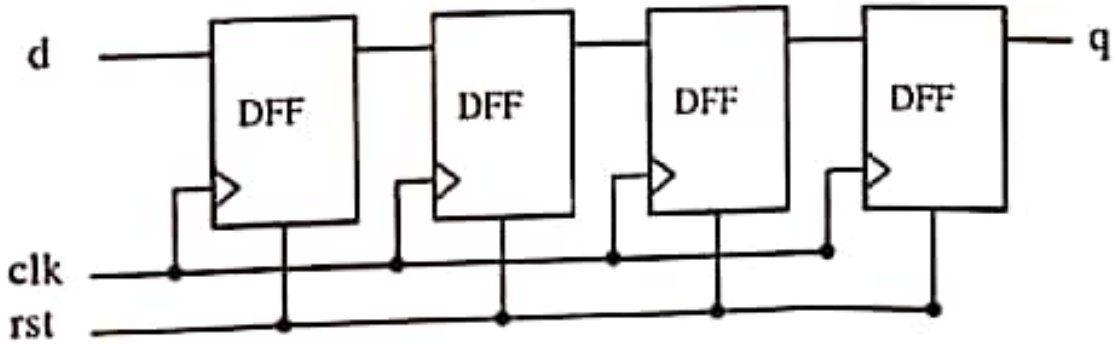
A complete *sequential* architecture code is:

A complete *structural* architecture code is:

P.T.O.

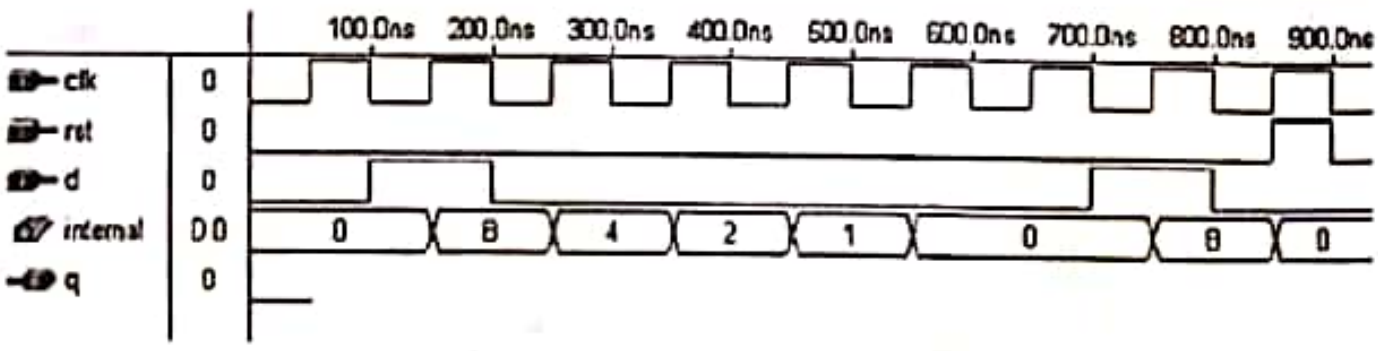
Third Question 40 Min/12 Marks

(a) Write the VHDL code to synthesize or simulate a 4-stage shift register illustrated below. Use a **SIGNAL** to generate the flip-flops. The output bit (q) should be four positive clock edges behind the input bit (d). Reset (rst) should be asynchronous, forcing all flip-flop outputs to '0' when asserted. After writing the VHDL code, complete the following timing diagram. *(7 Marks)*



Shift register

P.T.O.



Simulation results

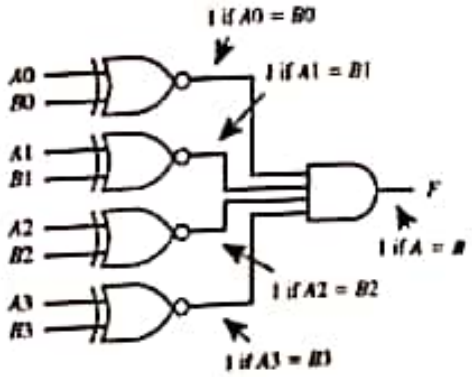
P.T.O.

b) Write a complete *concurrent* VHDL code for a 8-bit unsigned adder. *(5 Marks)*

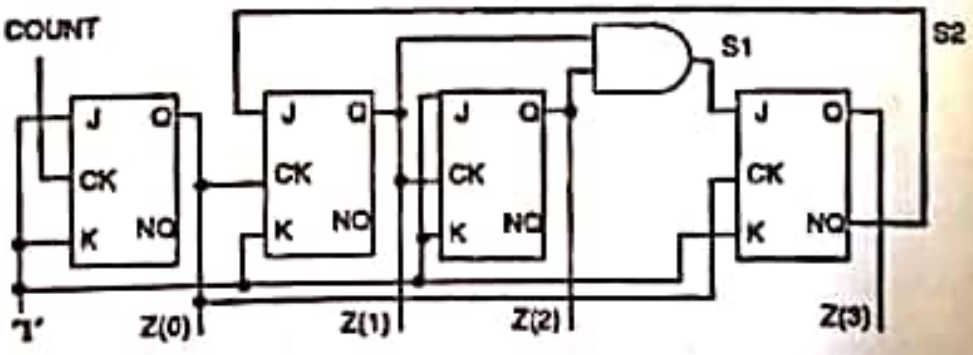
flops shown
(7 Marks)

Fourth Question *40 Min/12 Marks*

(a) Write a complete *dataflow* VHDL code that implements a 4-bit comparator shown below. *(5 Marks)*



(b) Write a complete *structural* VHDL model for a decade counter using J-K flip-flops shown below. *(7 Marks)*



P.T.O.

For design this sequence detector:

1) Draw an equivalent ASM chart.
2) Show the state and output table as well as the transition and output table.
3) Drive the Boolean logic expression for each flip flop output as well as Z output and show the hardware implementation of the sequencer detector.
4) Write a two-process VHDL model that synthesis the circuit.

With My Best Wishes

Question No		Q1	Q2		Q3		Q4		Q5			
			a	b	a	b	a	b	1	2	3	4
Achieved ILOs	A- Knowledge & Understanding	A1,4,5	A12	A8	A5	A8	A1	A4	A1	A12	A8	A1
	B- Intellectual skills	B7,12	B1	B5	B7	B3	B12	B1	B2	B7	B12	B2
	C- Professional and practical skills	C6	C1	C3	C2	C6	C3	C1	C2	C1	C1	C2
	D- General and transferable skills	D9				D6		D9	D6		D9	

Answer the following questions

(1) **(25 Marks)**

1-a) Comment on the following statements:

1- "... obtaining more computing power by stamping multiple processors on a single chip (MPSoC) rather than straining to increase the speed of a single processor...."

2- "NUMA architecture is not a natural parallel programming/algorithm model"

1-b) (True/False)

1- Uni-processor performance improvement via various implicit and explicit parallelism schemes and technology improvements has reached a point of no return.

2- Development of explicit parallel algorithms that are based on exploiting the parallelism inherent in a problem with minimum communication overhead is not efficient.

3- Amdahl's law studies how the behaviour of a scaled program varies when adding more computing power.

4- Processes are also called tasks, threads, or virtual processors.

5- There are three shared-memory multiprocessors models, UMA, NUMA, and COMA

6- In shared-memory multiprocessors, interprocessor communication is done in the memory interface by data transmission send and receive procedures.

7- In distributed-memory with message-passing, programming paradigm by read and write instructions

1-c) Fill in the spaces below:

1- The processor speed is often measured in terms of .....

2- The number of programs a system can execute per unit time, called the system .....

3- For each time period, the number of processors used to execute a program is defined as the .....

4- Running parallel programs on multiprocessors require ..... must communicate to complete the task.

5- Speedup performance models include ....., ..., ...

6- Classification of parallel computations include, ... , ... , ...

7- There are two major classes of parallel computers, ... , ...

(2) **(20 Marks)**

2-a) Multiple choice:

1- According to Sun and Ni law the speedup of a system with 6 processors and G(n) = n, if the sequential portion of the program 40% is:

A- 2 B- 3 C- 4 D- others

2- Suppose you want to achieve a speedup of 80 with 100 processors, according to

Instruction Type	Instruction count	Clock cycle count
Arithmetic and logic	380000	1
Load/store with cache hit	220000	2
Branch	150000	3
Memory transfer with cache miss	150000	4
Input/output	100000	5

i. Determine the effective CPI, MIPS rate, and execution time when the program is executed on a uniprocessor.

ii. Consider the parallel execution of the same program on an eight-processor with shared memory. The program can be partitioned into 8 parts (125,000 each) for balanced execution by the 8 processors with the same instruction mix ratio as in uni-processor (i.e. each type count may be divided by 8). Assume 5000 extra instructions are added to each divided part for synchronization. You can neglect any extra CPI due to multi-processors. Calculate the speedup factor of the eight-processor over the uni-processor system.

iii. Calculate the efficiency of the 8-processor system by comparing the speedup factor in part (ii) with the ideal case.

(3) **(15 Marks)**

3-a) Consider the following code is to be executed in a uni-processor system:

```
      Do 10 I = 1, N
      A(I) = B(I) + C(I)
10    Continue
      Do 20 J = 1, N
      SUM = SUM + A(J)
30    Continue
```

1- Rewrite the above code such that the program may be executed on an M-processor system.

2- If $N = 2^{16}$ and $M = 256$, calculate the number of cycles required to compute the total sum in both cases, the uni-processor and the parallel systems.

3- What is the efficiency which may be achieved?

3-b) Suppose we have an application running on a 32-processor multiprocessor, which has a 200 ns time to handle reference to a remote memory. For this application, assume that all the references except those involving communication hit in the local memory hierarchy. Processors are stalled on a remote request, and the processor clock rate is 2 GHz. If the base CPI (assuming that all references hit in the cache) is 0.5, how much faster is the multiprocessor if there is no communication versus if 0.2% of the instructions involve a remote communication reference?

(4) **(15 Marks)**

4-a) Answer the following questions for the 3-ary 4-cube network:

1- How many nodes does the network contain?

2- What is the network diameter?

3- What is the bisection bandwidth?

4- What is the node degree?

4-b) You are asked to design a direct network for a multicomputer with 64 nodes using a three-dimensional torus, a six-dimensional binary hypercube, and cube-connected-cycles (CCC) with a minimum diameter. Let d be the node degree, D the network diameter, and I the total number of links in a network. Suppose the quality of a network is measured by (d x

Network type	Node degree, d	Network diameter	No. of links, l	Bisection width, B	Symmetry
Linear Array	2	$N-1$	$N-1$	1	No
Ring	2	$\lfloor N/2 \rfloor$	N	2	Yes
Completely Connected	$N-1$	1	$N(N-1)/2$	$(N/2)^2$	Yes
Binary Tree	3	$2(k-1)$	$N-1$	1	No
Star	$N-1$	2	$N-1$	$\lfloor N/2 \rfloor$	No
2D-Mesh	4	$2(r-1)$	$2N-2r$	r	No
Illiac Mesh	4	$r-1$	$2N$	$2r$	No
2D-Torus	4	$2\lfloor r/2 \rfloor$	$2N$	$2r$	Yes
Hypercube	n	n	$nN/2$	$N/2$	Yes
CCC	3	$2k-1+\lfloor k/2 \rfloor$	$3N/2$	$N/(2k)$	Yes

University : Menoufia		Date	: 16/06/2016
Faculty : Electronic Engineering		Time	: 3 Hours
Department : Comp. Science & Eng.		No. of pages	: 1
Academic level : 3rd Year, 2nd term		Full Mark	: 60 Marks
Course Name : Operating Systems		Exam	: Final Exam
Course Code : CSE 324		Examiner	: Dr. Ayman EL-SAYED

Answer the Following Questions

The First Question (12 marks)

(a) What is the component of a computer system?
(b) What is an Operating System?
(c) What is "Job Pool"?
(d) State the operations on process?

The Second Question (12 marks)

(a) Draw a diagram of process states?
(b) What is the cooperating process?
(c) What is the difference between Job and Process?
(d) Define the following: Job scheduling and CPU scheduling?

The Third Question (12 marks)

(a) What is meant of CPU and I/O burst times?
(b) What is meant of Time-Sharing and multiprogramming?
(c) Explain the difference between preemptive and nonpreemptive scheduling.
(d) What are the CPU scheduling criteria?

The Fourth Question (12 marks)

There is a computer system having 3 processes with processing time of 80 ms, 40 ms and 70 ms respectively, without I/O operations. The CPU running for each process only 20 ms. PCB size is 10 kb, the data transfer rate in the system is 1 mbps. Suppose: 1 mb = 1000 kb, kb = 1000 bits. Calculate the following:

(a) The execution time for each process.
(b) CPU Utilization.
(c) Give your Opinion in this case.

The Fifth Question (12 marks)

Suppose that the following processes arrive for execution at the times indicated. Each process will run for the amount of time listed. In answering the questions, use nonpreemptive scheduling, and base all decisions on the information you have at the time the decision must be made.

(a) What is the average **turnaround time** and **waiting time** for these processes with the FCFS scheduling algorithm?

(b) What is the average **turnaround time** and **waiting time** for these processes with the SJF scheduling algorithm? In cases of both **preemptive** and **non-preemptive**.

Process	arrival-time	burst-time
P1	0	5
P2	1	3
P3	2	6
P4	3	3

Achieved ILOS :

Question No		Q1				Q2				Q3				Q4			Q5	
		a	b	c	d	a	b	c	d	a	b	c	d	a	b	c	a	b
Achieved	A- Knowledge & Understanding																	
	B- Intellectual skills																	
	C- Professional and practical skills																	
	D- General and transferable skills																	

Menoufia University Faculty of Electronic Eng. *Industrial Electronics & Control Eng. Dept.*	Professional Ethics and Quality of Products *3rd Year* - Date : 27/1/2016 Time Allowed : Two Hours

Answer the following questions :

1.a Engineering design generally involves five steps . How is ethical problem solving like this? (4 marks)

1.b Do you consider Roger Boisjoly morally responsible for the Challenger disaster? And do you think his separatist argument is sound? (4 marks)

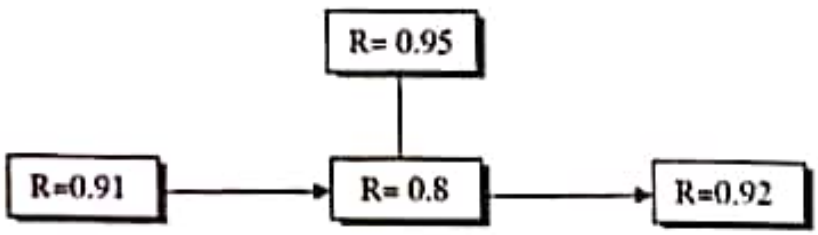
2.a Describe the elements that constitute a good decision. (5 marks)

2.b What are the key questions that guide the selection of the appropriate decision process ? (4 marks)

3.a Explain how TQM is different from the traditional notions of quality. (4 marks)

3.b Describe the dimensions of quality for manufacturing organizations versus service organizations. (4 marks)

3.c The following system of components has been proposed for a new product. Determine the reliability of the system. (4 marks)



4.. Define the quality management software , write down name of two applications and define the technological capabilities of these applications. (6 marks)

Faculty of Electronic Engineering Computer Science and Eng. Dept. 3rd year Operating Systems		Mid-term exam (2nd Term) Time: 60 minutes Date: 12/04/2016 Examiner: Dr. Ayman EL-SAYED

الدرجة :(_____) 20	فصل:	الاسم :

Answer the Following Questions

The First Question (8 marks)

(a) What is the component of a computer system?

(b) What is an Operating System?

(c) Draw a diagram of process states?

(d) State the operations on process?

The Second Question (6 marks)

(a) What is the Process Control Block (PCB)?

(b) What is the difference between Job and Process?

(c) Define the following: Job scheduling and CPU scheduling?

The Third Question (6 marks)

There is a computer system having 2 processes with processing time 80 ms and 70 ms, without I/O operations. CPU running for each process only 15 ms. PCB size is 10 KB, data transfer in the system is 1 mbps. Calculate the following:

(a) The execution time for each process.

(b) CPU Utilization.

(c) Give your Opinion in this case.

With my best wishes

ملحوظة: أجب عن الأسئلة السابقة في الصفحات التالية
بحيث كل سؤال في صفحة كما هو موضح في الصفحات التالية.

University : Menoufia		Date	: 16/06/2016
Faculty : Electronic Engineering		Time	: 3 Hours
Department : Comp. Science & Eng.		No. of pages	: 1
Academic level : 3rd Year, 2nd term		Full Mark	: 60 Marks
Course Name : Operating Systems		Exam	: Final Exam
Course Code : CSE 324		Examiner	: Dr. Ayman EL-SAYED

Answer the Following Questions

The First Question (12 marks)

(a) What is the component of a computer system?
(b) What is an Operating System?
(c) What is "Job Pool"?
(d) State the operations on process?

The Second Question (12 marks)

(a) Draw a diagram of process states?
(b) What is the cooperating process?
(c) What is the difference between Job and Process?
(d) Define the following: Job scheduling and CPU scheduling?

The Third Question (12 marks)

(a) What is meant of CPU and I/O burst times?
(b) What is meant of Time-Sharing and multiprogramming?
(c) Explain the difference between preemptive and nonpreemptive scheduling.
(d) What are the CPU scheduling criteria?

The Fourth Question (12 marks)

There is a computer system having 3 processes with processing time of 80 ms, 40 ms and 70 ms respectively, without I/O operations. The CPU running for each process only 20 ms. PCB size is 10 kb, the data transfer rate in the system is 1 mbps. Suppose: 1 mb = 1000 kb, kb = 1000 bits. Calculate the following:

(a) The execution time for each process.
(b) CPU Utilization.
(c) Give your Opinion in this case.

The Fifth Question (12 marks)

Suppose that the following processes arrive for execution at the times indicated. Each process will run for the amount of time listed. In answering the questions, use nonpreemptive scheduling, and base all decisions on the information you have at the time the decision must be made.

(a) What is the average **turnaround time** and **waiting time** for these processes with the FCFS scheduling algorithm?

(b) What is the average **turnaround time** and **waiting time** for these processes with the SJF scheduling algorithm? In cases of both **preemptive** and **non-preemptive**.

Process	arrival-time	burst-time
P1	0	5
P2	1	3
P3	2	6
P4	3	3

Achieved ILOS :

Question No		Q1				Q2				Q3				Q4			Q5	
		a	b	c	d	a	b	c	d	a	b	c	d	a	b	c	a	b
Achieved	A- Knowledge & Understanding																	
	B- Intellectual skills																	
	C- Professional and practical skills																	
	D- General and transferable skills																	

lty of Electronic Eng.
puter Science and Eng. Dept.
ear – 2nd Semester.

Subject: Image Processing
Allowed Time: 3 Hours
Data: 09/06/2016

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er the following questions:

question:

What is Digital Image Processing?

Image processing applications cover a wide range of human activities, Explain.

What is the difference :

Convolution and Correlation operators in the two dimensional domain.
Binary image, Monochrome image, and Color image.

---

id question:

How to measure each of the following digital distances: Euclidean distance, City block distance and chessboard distance? (Give the mathematical formulas).

For the two monochrome images below (X and Y), each of which represented as an array of unsigned integers, 8-bit (unit8), calculate Z=X+Y, using:

(a) Normalization and (b) Truncation.

[200 100 100; 0 10 50; 50 250 120] and Y=[100 220 230; 45 95 120; 205 100 0]

l question:

What is image digitization?

What is Filtering? Why are filters used?

Make a comparison between low pass filter and high pass filter.

th question:

What are geometric operations? Why are they used?

A triangle Q is defined by A(-20,60), B(30,30), and C(0,0). Using 3D- transformation matrix, apply the following transformations to Q to find the new position; which: firstly translates Q by 10 in the X-direction and 10 in the Y-direction and then rotates it counter-clockwise by 30° about (0,0), Sketch your answer.

مع أطيب الأمنيات بالتوفيق

Faculty of Electronic Engineering Dept. of Computer Sci & Eng. 3rd year: Mid Term exam Max. Marks: 15	Date: Monday 11/04/2016 Time: 1 hr. (11 – 12 am) **Parallel Processing CSE 321** Instructor: Prof. Dr. Nabil Ismail
Name: Class: Ac. No.:	الاسم: السكشن: الرقم الأكاديمى:

Answer the following questions:

[1]

i) What are the uni-processor enhancement techniques to achieve parallelism? explain their limitations?

ii) A 2.6 GHz processor was used to execute a benchmark program with 1000,000 instructions. The program consists of five major types of instructions. The instruction mix and clock cycle are given below:

Instruction Type	Instruction count	Clock cycle count
Arithmetic and logic	320000	1
Load/store with cache hit	280000	2
Branch	200000	3
Memory transfer with cache miss	120000	4
Input/output	80000	5

a) Determine the effective CPI, MIPS rate, and execution time when the program is executed on a uniprocessor.

b) Consider the parallel execution of the same program on a four-processor with shared memory. The program can be partitioned into four parts (250,000 each) for balanced execution by the four processors with the same instruction mix ratio as in uni-processor (i.e. each type count may be divided by 4). Assume 10000 extra instructions are added to each divided part for synchronization. You can neglect any extra CPI due to multi-processors.
Calculate the speedup factor of the four-processor over the uni-processor system.

c) Calculate the efficiency of the four-processor system by comparing the speedup factor in part (b) with the ideal case.

[2]

i)

1- Synchronization of all PEs in an SIMD computer is done by hardware rather than by software as is often done in most MIMD computers. (True/False)

2- In an MIMD computer, all processors must execute the same instruction at the same time synchronously. (True/False)

3- In the following pseudo code:

```
s := y / (x*x);
v[i] := s*a[i] + b[i], (0 ≤ I < N);
```

The largest integer value of N for which the processing element efficiency at least 60% is:

(a) N = 3 (b) N = 4 (c) N = 5 (d) N = 1

ii)

Write efficient vector pseudo code for a SIMD machine with N processing elements to do the following array computation.

```
for i := 2 step 1 until N
    for j := 2 step 1 until N
        X[I, J] := (X[I, J-1] + X[I, j+1])/2;
```

Answer all the following questions:

Question No. 1 *(15 Marks)*

a) Define software, software engineering, and software process. (3 Marks)

b) Compare Deliverables and Milestones. (2 Marks)

c) Compare Measures, Metries, and Indicators. (3 Marks)

d) Describe the attributes of software quality (six main attributes). (3 Marks)

e) A software organization plans to develop a system consisting of 36 KLOC. With a productivity of 900 LOC per person-month, find the required number of persons (developers) to develop this software in 40 days. (4 Marks)

Question No. 2 *(12 Marks)*

a) Why the Software-development Life cycle is used? (2 Marks)

b) What are the different steps in the software-development life cycle? What are the products at each step? (6 Marks)

c) Define briefly the types of maintenance. (4 Marks)

Question No. 3 *(18 Marks)*

a) Define: Requirement Engineering and describe the various steps of requirements engineering. (6 Marks)

b) Define the requirements traceability. (3 Marks)

c) Define data flow diagram and context diagram. (4 Marks)

d) A computer-based system performs three actions (A1, A2, and A3) based on the status of 3 switches. If at least one of the three switches is ON, it performs A1. If two of the switches are ON, it performs A2. If an odd number of the switches is on, it perform A3.

i. Construct a decision table for the system

ii. Is the decision table complete? Why?

iii. Is there any contradictory or redundant rules? Why?

(5 Marks)

Question No. 4 *(17 Marks)*

a) Describe the various desirable properties or objectives of software design. (4 Marks)

b) Define modularization, coupling, and cohesion. (3 Marks)

c) Describe the structured design methodology (SDM) and its major steps. (6 Marks)

d) Describe the design metrics. (4 Marks)

Question No. 5 *(16 Marks)*

a) Define software testing. (2 Marks)

b) Compare the three levels of testing: unit testing, integration testing, and system testing. (5 Marks)

c) Compare the three kinds of system testing. (5 Marks)

Best Wishes ***Dr. Mohammed Badawy***

Menoufyia University

Faculty of Electronic Engineering

Computer Science and Engineering Department

3rd Year – 2nd semester

Subject : Image Processing

Date : 13/04/2016

Allowed Time : hour

Midterm

Answer the following questions :

1) What is the meaning of image acquisition ? Explain the different type of sensors used ,specially sensor arrays .

2) a- Define the affine transformation ?

b- Given a triangle shape vertices A(-20,60) ,B(0,0) and C(40,60) , generate the affine transformation matrix for each of the following operations :

i) Rotation by 90° clockwise ($\sin 90^{\circ} = 1$ $\cos 90^{\circ} = 0$)

ii) Translation by [25,15]

iii) Rotation by 90° clockwise and translation by [25,15] .

Hence find the new coordinate of vertex A .

Menoufia University

Faculty of Electronic Engineering

Department of Computer Science & Eng.,

Third year

Second Mid Term Exam

Subject: Advanced computer network

Date: 9-4-2016

Time: 60 min

.....الامتحان فى اربع صلحات.....

الاسم: السكشن: الرقم الاكاديمى:

complete the missing parts

1- Static routes should be used in the following cases 1) ...2).....3)

2- The components of a routing protocol are: .....

3- Load balancing means .....

4- The routing protocols ....., ... and ..... are distance vector routing protocols, while..... is a link state routing protocol.

5- Distance vector routing protocol means that the routes are advertised as vectors of ..... and .....

6- A default route is a ..... route with the IP address of .....

7- The supernet route is a network address with a mask .....than the classful mask.

8- The metric of the EIGRP are .....and.....

9- RIPv2 supports some characteristics such as ..... and.....which are not supported with RIPv1.

10- VLSM means.....while CIDR means.....

Answer the following questions:

2- State the function of distribution layer switch, access layer switch, and core layer switch.

3-(a) What are the benefits of a VLAN?

(b) State the different types of inter VLAN routing and the characteristics of each of them

4-(a) For the IP network address 172.10.0.0/16, if you borrow 2 bits from the host portion,

What will be the addresses of the new sunets? How many hosts are there for each subnet?

(b) If you borrow 3 bits from the last subnet obtained from case 4-(a)

What will be the addresses of the new subnets? How many hosts are there for each subnet?

5-Calculate the summarized route of the four networks 2001:0DB8:ACAD:00A::/64, 2001:0DB8:ACAD:000B::/64, 2001:0DB8:ACAD:000C::/64, 2001:0DB8:ACAD:000E::/64

Answer the Following Two Questions:

Question One — **10 Points**

a. Define software, software engineering, and software process.
b. Define briefly Software Processes' Activities.
c. Compare Measures, Metrics, and Indicators

Question Two — **10 points**

a. Discuss the Software Development Life Cycle (SDLC) in brief.
b. Explain briefly the types of maintenance.
c. What are the important activities that are carried out during the feasibility study phase?

Question Three — **10 Points**

Answer all the following questions

1- The following questions are multiple choices. Please select from A-D

I- ------- occurs when there is more than one cable being used.
(A) Noise
(B) Skew
(C) Crosstalk
(D) Attenuation

II- ------- this technology is similar to that found in remote controls for televisions.
(A) Infrared:
(B) Bluetooth:
(C) Cellular:
(D) Microwave:

III- A packet is the protocol data unit for which layer of OSI-RM?
(A) Presentation
(B) Session
(C) Transport
(D) Network

IV- Which type of segmentation device enables high-speed data exchange?
(A) Hub
(B) Repeater
(C) Switch
(D) Bridge

V- A ------- has a limit length and the number of devices which can be attached to it.
(A) Local Area Network
(B) Network Segment
(C) Personal Area Network
(D) Private Area Network

VI- A ------- cable is not used for a network connection.
(A) rollover
(B) crossover
(C) serial
(D) straight through

VII- What is the common type of cabling media used in computer networks?.
(A) Coaxial Cable
(B) Twisted Pair
(C) PTN
(D) ISDN

VIII- The ------- is the only device that sees every message sent by any computer on either of the company's networks.
(A) Repeater
(B) Switch
(C) Bridge
(D) Router

IX- ------- layers control physical delivery of messages over the network.
(A) Application, presentation, session
(B) Application, presentation, session, transport
(C) Physical, data link, network, transport
(D) Physical, data link, network

X- A------- is created between two network devices

(A) NAS 
(B) Switch 
(C) VPN tunnel
(D) IDS Sensor 

[10-marks]

PTO

2- Choose (T) for the true sentence and (F) for the false sentence:

I- ISDN Adapters are common DTE example. (T/F)
II- Baseband transmission using a digital modulation method. (T/F)
III- Session layer of OSI ensures reliable end-to-end delivery of data. (T/F)
IV- Available bit rate on a cable depends on bandwidth and delay of the cable. (T/F)
V- MAC address bit length is 24-bits and its expression form as a binary number. (T/F)
VI- Frame header and frame trailer are added on physical layer of OSI-RM. (T/F)
VII- The maximum length of twisted pair is 500/700m. (T/F)
VIII- Protocol refers to the physical arrangement of network components. (T/F)

[24-mark]

3- Select the best and correct word to complete the following sentences:

Skew– switch – NIC – DTE – Session – UTP – Transport – Telephone – Application– Delay –AUI–MAC – Crosstalk –DCE – Congestion – LLC – RS232–Services – PDUs –Gateways –Noise – Network – Bridges –Low throughput– Host –

a- ------ is unwanted electrical signals that find their way onto the wire.
b- ------ is a` common example of a serial interface standard.
c- The best path to a network is determined in the ------ layer of OSI-RM.
d- ------ implement application layer conversions of information received from various protocols.
e- The effects of sustained, heavy collisions in CSMA/CD LANs are ------, ------, -----.
f- Two forms of application layer of OSI-RM software are ------, -----.
g- The two sub-layers of data link layer are ------, -----.
h- Every ------ has its own MAC address that identifies the PC on the network.

[12-mark]

4- a- What are the external factors affecting the success of communication across the network?
b- What are the protocols that govern successful human communication?
c- What are the following abbreviations stand for : RJ-45, AUI, BNC, SC, ST, and RS-232C? State what is the need for each?

[22-mark]

5- a- What are the major Characteristics of LANs?
b- What does the function that software driver provide?
c- You want to set up a router configuration and there is no console cable available. What is the kind of cable connection you need to make the configuration? Write the order of wiring scheme used according to the EIA/TIA 568B.

[22-mark]

...Best Wishes...

This exam measures the following ILOs									
Skills	Knowledge & Understanding Skills				Intellectual Skills				Professional Skills
	a2,3,4,8,16	a2,3,4,8,16	a2,3,4,8,16	a2,3,4,8,16	b2,8,12	b2,8,12	b2,8,12	b2,8,12	c1,2,14
Question Number	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q5

Answer four questions only. Question [5] is mandatory (اجباري!)

(All Programs must be written in Java Programming Language):

[1] Define (**in short**) the following object-oriented programming support key-words: **[25 Marks]**

object – class – constructor – UML – reference type – **new** operator – dot (.) operator – data field encapsulation – setter – getter – this – inheritance – polymorphism – extends – super – overriding – overloading – dynamic binding – casting – scene – pane – event-driven programming – event handler – listener object – Lambda expression.

[2] a) Multiple choice questions: **[10 Marks]**

1. _____ describes the state of an object.

   a. data fields b. methods c. constructors d. none

2. An attribute that is shared by all objects of the class is coded using _____.

   a. an instance variable b. a static variable c. an instance method d. a static method

3. If a class named Student has no constructors defined explicitly.

   One of the following constructor is implicitly provided:

   a. public Student() b. protected Student() c. private Student() d. Student()

4. When you implement a method that is defined in a superclass, you _____ the original method.

   a. overload b. override c. instantiate d. invoke

5. What modifier should you use on a variable so that it can only be referenced inside its defining class.

   a. public b. private c. protected d. use the default modifier

6. The `final` method cannot be overridden by its subclass. (True/False)

7. You can always successfully cast an instance of a superclass to a subclass. (True/False)

8. Integer and Double can be used as source objects in a binding. (True/False)

9. setOnKeyPressed is the method you should use to register a handler for a mouse pressed (True/False)

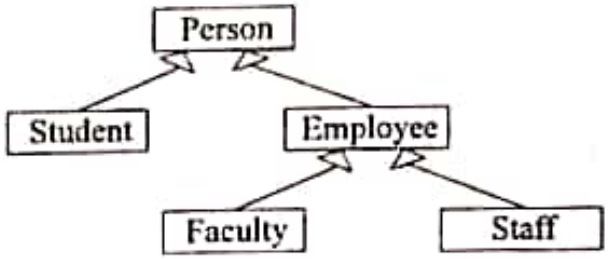
10. setOnMouseReleased is the method you should use to register a handler for a mouse released. (True/False)

b) Show the output of the following code: **[5 Marks]**

```
public class F {
int i = 5;
static int k = 2;
```

```
public static void main(String[] args){
F a = new F();
int j = a.i;
a.m1();
System.out.println("result = " + a.i); }
public void m1(){
i = i + k + m2(i,k);}
static int m2(int i, int j){
return (int)(Math.pow(i,j)); } }
```

[3] Design a class named Person and its two subclasses named Student and Employee. Make Faculty and Staff subclasses of Employee as shown in the Figure. A person has a name, address, phone number, and email address. A student has a class status (freshman, sophomore, junior, or senior). Define the status as a constant. An employee has an office, salary, and date hired. Define a class named MyDate that contains the fields year, month, and day. A faculty member has office hours and a rank. A staff member has a title. Override the toString method in each class to display the class name and the person's name.

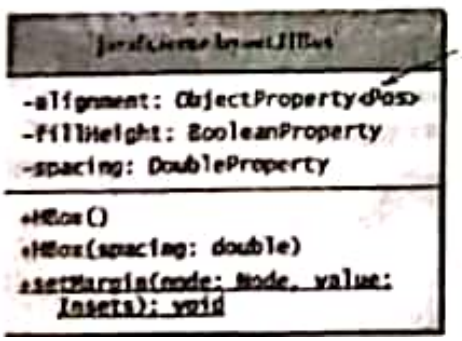


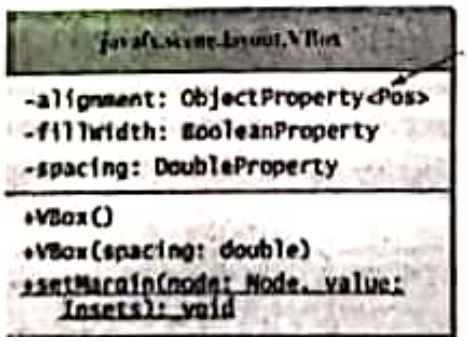
a) Draw the detailed UML diagram for the classes.

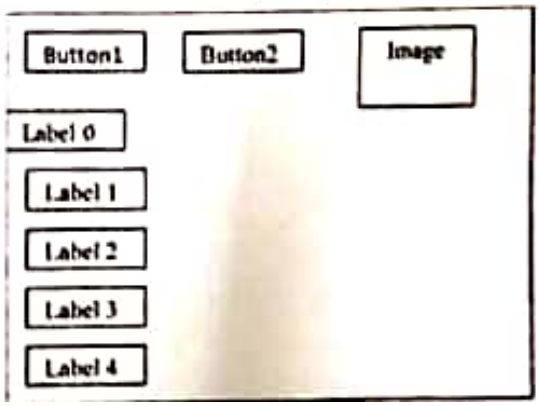
b) Write a test program that creates a Person, Student, Employee, Faculty, and Staff, and invokes their toString() methods.

[20 Marks]

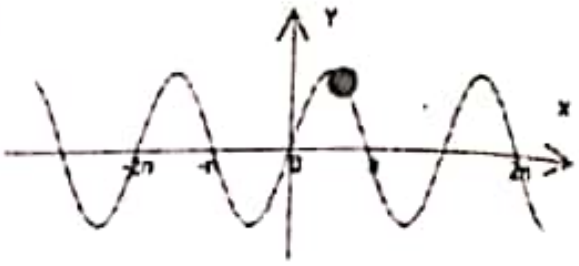
[4] Write a program to Implement HBox, VBox, and ImageView classes to create and place two buttons and an image in an HBox and five labels in a VBox. The UML diagrams for the classes HBox and VBox are shown in Figure (4a). Also, the expected output scene is shown in Figure (4b). The scene should grow and shrink as the window grows or shrinks.







[5] Write a program that animates a ball moving along a sine curve, as shown in the Figure. When the ball gets to the right border, it starts over from the left. Enable the user to resume/pause the animation with a click on the left/right mouse button. You may need to make use of the following classes in your solution; PathTransition, Timeline, ObservableList, MouseButton, Circle, Line, Polyline, and Duration classes in addition to the main stage layout classes.



Note: the following steps may help in the design of the program;

1- Setup a new pane
2- Simulate the sine curve by a list of points on polylines with a specified range.
3- Draw arrows to represent the x- and y- axis.
4- Draw x, y axis labels
5- Type the texts along the x-axis (-2π to 2π), the Unicode of the character π="\u03c0"
6- Draw a filled circle to represent the "ball"
7- Add all the polylines together in order to have a complete sinusoidal curve
8- Create a scene (contains the axis, sine curve, ball) and place it in the stage
9- Display the stage
10- Initialize the path transition (set path, node, orientation, cycle count, auto reverse)
11- Start animation and set on the mouse events.

[30 Marks]

Menoufia University
Faculty of Electronic Engineering
Computer Science & Engineering Dept.
Third Year – 1st Semester
Examiner: Dr. Mokhtar A. A. Mohamed

2016 - 2017

Mid-Term Exam
Subject: Elective course I (CSE 315)
Exam Date: 17 / 11 / 2016
Allowed Time: 60 Minutes
Total Mark: 20 Marks
No of Pages: 1

إسم الطالب: ..... الفصل: .....

Answer all the following questions

First Question: (10 Marks)

a) State how timer 0 can be configured to operate as a timer or as a counter. *(2 Marks)*

b) List the required steps to set up timer 1 to cause high interrupt if it will begin counting from the count value 65317. You can use its prescalar value as 1:8. *(4 Marks)*

c) Design a PIC 18F452-based system and write its MikroC program. This system should use timer 0 as counter to count pulses coming from a switch circuit that connected to RA4 pin. Each count should be displayed on a 7-segment (with its built-in decoder) connected to PORTC. When the count of timer 0 reaches to 7, you should restart timer 0 to begin counting from 0 again. Make sure that this counter will operate in falling-edge. *(4 Marks)*

Answer the following questions: *[Total Mark: 70]*

First question: *[10]*

(a) What is the input-output interface unit? List the goals of this unit. [3]
(b) Draw the internal structure of an I/O interface unit and describe how to address its ports. [3]
(c) Briefly describe the handshaking method. [2]
(d) Briefly describe the asynchronous serial data transfer. [2]

Second question: *[15]*

(a) What is interrupt? Briefly describe the different classes of interrupts. [3]
(b) Briefly describe the behavior of CPU when detects an interrupt signal. [2]
(c) By using state diagram, show the possible states that define an instruction cycle with interrupt and indirect cycles. [3]
(d) What is pipeline and what is the main purpose of pipelining? [2]
(e) What are the problems of two-stage pipeline? How to solve the problems. [2]
(f) Draw the timing diagram of 6 stages pipelines of 9 instructions. What is the achieved speed up? [3]

Third question: *[15]*

(a) Show the internal structure of the SRAM cell and describe how to store logic 1 in this cell. [3]
(b) Show the internal structure of the ROM cell and describe how to store logic 1 and 0 in this cell. [3]
(c) Write short description for different types of ROM. [4]
(d) A computer uses RAM module of capacity 4096 bytes. [5]
   i. How many chips are needed if the available RAM chips have 512B?
   ii. How many lines of the address bus must be used to access this memory?
   iii. How many address lines will be common to all chips?
   iv. How many lines must be decoded for chip select? Specify the size of the decoders.

Fourth question: *[20]*

(a) A ROM chip of 1024 x 8 bits has two chip select inputs. Draw a block diagram of pin connections in this ROM chip. [4]
(b) Assuming 2048B ROM chip with active low chip select is required to connect with 8-bit microprocessor containing 16 address lines. Show how to connect this chip with the microprocessor in order to work in the address range 0000_h to $07FF_h$ [6]
(c) Construct 4KB of RAM module from RAM chips arranged as 1024 bytes with active low CS. Show the range of addresses of this memory module and show the range of addresses of each chip if the processor has 16 bit address lines. [10]

Fifth question: *[15]*

(a) What is cache memory? Briefly describe the basic operation of cache memory. [4]

(b) A digital computer has a memory unit of 64K x 16 and a cache memory of 1K words. The computer uses direct mapping with a block size of 32 words.

1. How many memory blocks and how many cache lines are used. [2]
2. How many bits are there in the tag, line and word fields of the address format if the microprocessor has 16-bit address? [3]
3. How many bits are there in the block and word fields of the address format if the microprocessor has 16-bit address? [2]
4. Into what line would word with each of the following addresses be stored? [4]

0001 0001 0001 1011
1010 1010 1010 1010

« With my best wishes »

Dr. Gamal ATTIYA

Faculty of Electronic Engineering Dept. of Computer Sci & Eng. 3rd year: Mid Term exam Max. Marks: 15	Date: Monday 14/11/2016 Time: 1 hr. (11 – 12 am) **Advanced Programming Languages CSE 312** Instructor: Prof. Dr. Nabil Ismail
Name: Class: Ac. No.:	الاسم: المكشن: الرقم الأكاديمي:

Answer the following questions:

1) What is wrong in the following class? (2 Marks)

```
public class Test {
    public in factoria(int n){
        int result = 1;
        for (int i=1; i<=n; i++)
            result *= i;
        return result;
    }
}
```

2) What is the printout of the following code? (2 Marks)

```
class Customer {
    private int customerId;
    public void setCustomerId(int customerId){
        customerId customerId;
    }
    public int getCustomerId(){
        return customerId;
    }
}
class Retail {
    public static void main(String[] args) {
        Customer custObj = new Customer();
        custObj.setCustomerId(1001);
        System.out.println("Customer Id:"
            +custObj.getCustomerId());
    }
}
```

3) Write a Java class "`Test`" to: (4 Marks)

a. Create two objects `x` and `y` of the class `Circle`
b. Define a method of the class `Circle` to swap two objects
c. Invoke the method in order to swap the radius of the two objects `x` and `y`.
d. Display the radii before and after the swap.
e. Draw the class `Test` UML diagram

4) Multiple choice questions: (3 Marks)

a. A default method can be accessed from a subclass in a different package
i. not known ii. true iii. false

b. One common use of the **`this`** keyword is reference a class's ..... data fields:
i. private ii. protected iii. hidden

c. Analyze the following code:

```
public class Test {
  private int t;
  public static void main(String[] args) {
    int x;
    System.out.println(t);
  }}
```

i. The program compiles and runs fine.

ii. The variable `t` is private and therefore cannot be accessed in the `main` method.
iii. The variable `x` is not initialized and therefore causes errors.
iv. `t` is non-static and it cannot be referenced in a static context in the main method.

5) Design a class named QuadraticEquation for a quadratic equation (4 Marks)

$$ax^2 + bx + c = 0$$

The class contains:

- Private data fields a, b, and c that represent three coefficients.
- A constructor for the arguments for a, b, and c.
- Three getter methods for a, b, and c.
- A method named getDiscriminant() that returns the discriminant, which is $b^2 - 4ac$.
- The methods named getRoot1() and getRoot2() for returning two roots of equation:

$r_1 = \frac{-b+\sqrt{b^2-4ac}}{2a}$ and $r_2 = \frac{-b-\sqrt{b^2-4ac}}{2a}$

Draw the UML diagram for the class and then implement the class.

اسم الطالب: الفصل: الرقم الأكاديمي:

Shortly answer the following questions on the same paper:

1-Draw the DoD architecture and define the name of each layer. Then, define the MIL-STD-1777 Internet Protocol. [4]

2-Which class the following IP address belongs to: [195.15.20.25], then state the range of that class. [2]

3-What are the drawbacks of Message Switching? [1.5]

4-Which layer of the OSI's layers is responsible about the end-to-end connection reliability? [1]

5-What are the LLC and MAC Stand for? State the function of each one. [3]

6- State the merits and demerits of OSI-RM. [3.5]

7-What are the transmission modes? [3.5]

8-State what are the message delivery options? [1.5]

...Best Wishes...

Name:- ..... Class:- .....

Answers *all* from following questions [15 Marks]

I) State the types of DAI systems and the difference between them. [5 Marks]

II) Define the Intelligent Agent with its characteristics. [5 Marks]

III) Explain the Deliberative Architectures of Intelligent Agent. [5 Marks]

With my best wishes **Dr.Eng. Ahmed M. Elmahalawy**

Faculty of Electronic Engineering
Dept. of Computer Science & Engineering
Computer Networks 3rd year
The Answer of MTExams. 21-12-2015

1-What are the main reasons for Internetworking? [4]

There are two main reasons for Internetworking:

1- Different applications and environments need different networks, which nevertheless should be able to exchange information.
2- Secondly, needs for world wide communications via computer networks. To accomplish the task of interconnecting networks special interconnection devices (hubs, switches, routers, etc.) are needed.

2-When does the collision occur? Which network uses process caused collision? [2]

The collision occurs:
If two nodes send out packets at the same time, a collision occurs and the packets are lost. [1]
Network uses process caused collision:
Ethernet uses a process called (CSMA/CD) to communicate across the network. [1]

3-What is meant by ARCNet? What does topology use? [2]

ARCNet is meant: Attached Resource Computing Network, [1]
ARCNet uses Star topology and bus topology. [1]

4-Write the order of wiring scheme according to the EIA/TIA-568B RJ-45 Straight Through connection. [4]

The order of wiring scheme according to the EIA/TIA-568B RJ-45 Straight Through connection as follow:

- Pair#2 is connected to pins 1 and 2 like this:
- Pin 1 wire color: white/orange [1]
- Pin 2 wire color: orange [1]
- Pair#3 is connected to pins 3 and 6 like this:
- Pin 3 wire color: white/green [1]
- Pin 6 wire color: green [1]

Faculty of Electronic Engineering Dept. of Computer Sci & Eng. 3rd year: Mid Term exam Max. Marks: 15	Date: Sunday 22/11/2015 Time: 1 hr. (11 – 12 am) **Advanced Programming Languages CSE 312** Instructor: Prof. Dr. Nabil Ismail
Name: Class: Ac. No.:	الاسم: السكشن: الرقم الأكاديمي:

Answer the following questions:

1) What is wrong in the following programs? (2 Marks)

```
1  public class ShowErrors {
2    public void method1() {
3      Circle c;
4      System.out.println("What is radius "
5        + c.getRadius());
6      c = new Circle();
7    }
8  }
```

```
1  public class ShowErrors {
2    public static void main(String[] args) {
3      C c = new C(5.0);
4      System.out.println(c.value);
5    }
6  }
7
8  class C {
9    int value = 2;
10 }
```

2) What is the printout of the following code? (2 Marks)

```
public class F {
  private boolean k;
  public static void main(String[] args) {
    F f = new F();
    System.out.println(f.k); }}
```

3) Write a Java class "`Test`" to: (4 Marks)

a. Create two objects `x` and `y` of the class `Circle`
b. Define a method of the class `Circle` to swap two objects
c. Invoke the method in order to swap the radius of the two objects `x` and `y`.
d. Display the radii before and after the swap.
e. Draw the class `Test` UML diagram

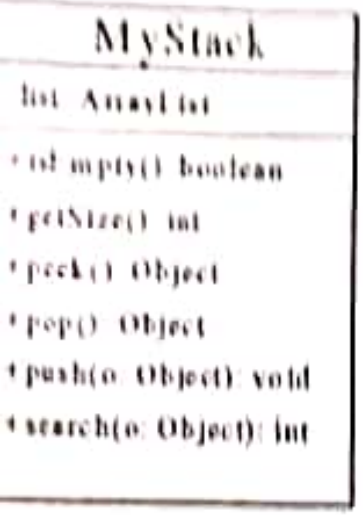
4) Multiple choice questions: (3 Marks)

a. If a method in a subclass has the same signature as a method in its superclass with the same return type, is the method:
   I. overridden II. overloaded III. neither
b. You can always successfully cast an instance of a subclass to a superclass:
   I. not known II. true III. false
c. Analyze the following code:

```
public class Test {
  private int t;
  public static void main(String[] args) {
    int x;
    System.out.println(t);
  }}
```

I. The program compiles and runs fine.
II. The variable `t` is private and therefore cannot be accessed in the `main` method.
III. The variable `x` is not initialized and therefore causes errors.
IV. `t` is non-static and it cannot be referenced in a static context in the main method.

5) Design a `stack` class for holding objects using an `ArrayList` with the following `MyStack` class UML diagram. (4 Marks)



A list to store elements

Returns true if this stack is empty

Returns the number of elements in this stack

Returns the top element in this stack

Returns and removes the top element in this stack

Adds a new element to the top of this stack

Returns the position of the first element in the stack from the top that matches the specified element

Menufiya University
1st Term – Midterm Exam
Class: 3rd Year
Subject: Artificial Intelligence

Faculty of Electronic Engineering
Dept. of Computer Science and Engineering
Time: 1.30 hours
Date: 26/11/2015

Name:- .....

Class:-..... Academic No.:.....

Answers *all* from following questions [15 Marks]

I) State True or False for each statement and **correct the false one**. [5 Marks]

1- AI on developing only hardware system that solve problems and accomplish tasks.

2- AI techniques let the program to reason logically.

3- A problem instance consists of a problem space, an initial state, and a set of goal states.

4- An algorithm is a procedure that is not guaranteed to solve the problem or accomplish the task for which it is designed.

5- A* search combines the best parts of greedy search, namely the fact that it's optimal and complete, and the best parts of uniform cost search, namely its speed.

II) Choose the correct answers. [5 Marks]

1- AI is a branch of the field of (computer engineering, information science, operating system)

Computer Networks 3rd year
The Answer of MTExams. 21-12-2015

1-What are the main reasons for Internetworking? [4]

There are two main reasons for Internetworking:

1- Different applications and environments need different networks, which nevertheless should be able to exchange information.
2- Secondly, needs for world wide communications via computer networks. To accomplish the task of interconnecting networks special interconnection devices (hubs, switches, routers, etc.) are needed.

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The order of wiring scheme according to the EIA/TIA-568B RJ-45 Straight Through connection as follow:

- Pair#2 is connected to pins 1 and 2 like this:
- Pin 1 wire color: white/orange [1]
- Pin 2 wire color: orange [1]
- Pair#3 is connected to pins 3 and 6 like this:
- Pin 3 wire color: white/green [1]
- Pin 6 wire color: green [1]

5-What is meant by MSAUs? Which network uses it? [2]

MASUs is meant Multi Stations Access Units [1]
Token Ring network uses MSAUs to create the network (it looks like switch with CSMA/CD[1]

6-What the network structure can thought with? [2]

The network structure can thought with:
Data Terminal Equipment (DTE). [1]
-Data Circuit Terminating Equipment (DCTE) or (DCE) concept. [1]

7-Define what is the Propagation Delay and the Transmission Delay. [2]

The Propagation Delay is:
Propagation delay: delay for the first bit to go from a source to a destination [1]
The Transmission Delay is:
Transmission delay: time to pump data onto link at reserved rate [1]

8-What are the OSI's layers provide accurate data delivery between computers? What is the name of those layers ? [2]

The OSI's layers provide accurate data delivery between computers are:
Application layer, Presentation layer, Session layer, and Transport layer. [1]
The name of those layers is: Host Layers. [1]

Total = Q1 + Q2 + Q3 + Q4 + Q5 + Q6 + Q7 + Q8
= 4 + 2 + 2 + 4 + 2 + 2 + 2 + 2
= 20

Shortly answer the following questions on the same paper:

1-What are the main reasons for Internetworking? [4]

2-When does the collision occur? Which network uses process caused collision? [2]

3-What is meant by ARCNet? What does topology use? [2]

4-Write the order of wiring scheme according to the EIA/TIA-568B RJ-45 Straight Through connection. [4]

5-What is meant by MSAUs? Which network uses it? [2]

6-What the network structure can thought with? [2]

7-Define what is the Propagation Delay and the Transmission Delay. [2]

8-What are the OSI's layers provide accurate data delivery between computers? What is the name of those layers? [2]

...Best Wishes...

Menoufia University
Faculty of Electronic Engineering
Computer Science and Engineering Dept.
Third Year (Computer) – (2015/2016)

Mid Term Exam
Computer Architecture
Date: 21-11-2015
Time: 60 min

NAME: ..... Section: .....

Answer the following questions:

First question: (10 marks)

(a) What is the I/O interface unit and what are the goals of this unit? (2)

.....

(b) Describe the differences between the CPU and peripheral devices. (2)

.....

(c) Describe the two methods of asynchronous data transfer. (2)

.....

(d) Show the internal structure of the I/O interface unit and describe how to address the different ports of this unit. (2)

(e) Briefly describe the asynchronous serial data transfer. (2)

Second question: (10 marks)

(a) What is interrupt? Describe the CPU behavior when detects an interrupt signal. (2)

(b) By using state diagram, briefly describe the possible states that define an instruction cycle with interrupts and indirect cycle. (2)

(c) What is pipeline? What are the problems of two stages pipelining? How to solve these problems. (3)

(d) Show the timing diagram of 6 stages pipeline for 9 instructions. What is the achieved speed up? (3)

« With my best wishes »

Examiner: Dr. Gamal Mahrous

Specialization: Computer Science & Eng.
Form: Third Year
Subject: Selected Topic (1) – "Java"
Examiner: Dr. Osama Elshakankiry

Academic Year: 2014/2015
Term: First Term
Date: 1 / 1 / 2015
Time: 180 min

Attempt all questions | No. of questions : 3 | No. of pages: 4

ملحوظة: إجابة السؤال الأول تكون في جدول مكون من عمودان، الأول به رقم السؤال والثاني به الحرف الدال على الاجابة الصحيحة (A, B, C, or D).

Question 1: Select the best possible answer [22 marks]

1- How do you design a method so it will return a value?
a) Specify a return type with the static keyword
b) Specify a return type with the void keyword
c) Specify a return type with a return statement
d) Specify a class method with the static keyword

2- What output is generated by the following code?
```
int i = 258;
byte b = (byte) i;
System.out.print(b);
```
a) 1 b) 2 c) 58 d) 258

3- How can you create a package?
a) By placing a package statement at the top of a Java source file
b) By placing the public keyword in a class declaration
c) By placing the package keyword in a class declaration
d) By creating subdirectories using periods to separate directories

4- Which of the following is true about GridLayout?
a) The layout is divided into five regions.
b) Components are automatically added from right to left and top to bottom.
c) If you add more components than will fit, another row will automatically be added.
d) The north and south regions give the added component its preferred height and do not change the component width

5- How do local variables differ from class variables?
a) A class variable is defined inside a method.
b) A local variable is available throughout a class.
c) A local variable is defined outside of any method.
d) A class variable can be accessed from various methods.

6- Which of the following helps you to resolve namespace conflicts between a member's parameter list and its variables?
a) The keyword sub
b) The keyword this
c) The keyword super
d) A no-arguments constructor

7- An interface consists of what?
a) Abstract classes and final methods

19- Which of the following allows Java developers to consider an object in terms of its functionality instead of its implementation details?

a) Object-oriented technology
b) Object references
c) Abstraction
d) Inheritance

20- When does garbage collection occur?

a) Whenever the developer initiates it
b) At regular scheduled intervals in the life of a Java program
c) Any time the JVM performs it before memory is no longer in use
d) Any time the JVM performs it after memory is no longer in use

21- What is encapsulation?

a) A method that modifies a variable
b) A collection of classes stored in a directory structure
c) The wrapping of variables with methods to control access to them
d) A method that only reads a variable

22- How does a Java applet differ from an application?

a) An application always runs in a Web browser.
b) An applet always runs in a Web browser.
c) An application does not have a main method.
d) An applet does not have a distinct life cycle.

Question 2: Briefly answer the following questions [21 marks]

1- What is a signed applet? How does it differ from unsigned applet?

2- What is a layout manager? Name at least three layout managers?

3- What is a container in Swing? How does a top-level container differ from a lower-level container?

4- What are the four rules to remember regarding applets and Web browsers?

5- What does the term "modal" mean in relation to Swing components?

6- List three reasons that Java packages are useful?

7- What is encapsulation? Name two advantages of encapsulation in object-oriented programming?

Question 3: [27 marks]

1. Create a class called Employee that includes three pieces of information as instance variables a first name (type String), a last name (type String) and a monthly salary (double). Your class should have a constructor that initializes the three instance variables. Provide a *set* and a *get* method for each instance variable. If the monthly salary is not positive, set it to 0.0. Write a test application named EmployeeTest that demonstrates class Employee's capabilities. Create two

2- **Choose (T) for the true sentence and (F) for the false sentence. Write the correct answer for the false sentence:**

I- Shannon proposed a model for a communications over LANs. (T/F)
II- Crosstalk is a problem related to timing in parallel cables. (T/F)
III- Modem converts analog signal to analog data and vice versa. (T/F)
IV- Optical media allows information to be sent in the form of digital. (T/F)
V- The repeater is the only device that sees every message sent by any computer on either of the company's networks. (T/F)
VI- Propagation delay is the time to pump data onto link at reserved rate. (T/F)
VII- The function of the OSI physical layer is access to media. (T/F)
VIII- The SC-type connector is an European Fiber optic connector. (T/F)

[16-marks]

3- **Select the best and correct word to complete the following sentences:**
Appropriate cable– switch – circuit establishment – DTE – Session – UTP – Transport – Telephone –NIC – data transfer – Multidrop –AUI– DCE – Point to point – PDUs – circuit termination – Network Codec – Digital Transceiver

a- Each layer's protocol exchanges information, called ------ between peer layers
b- ------ layer, provides end-to-end connection reliability.
c- ------ configuration allows more than two devices are connected to the same channel.
d- The maximum length of ------ cable is 100m.
e- Full duplex connection basically needs three things: ------ , ------ , ------.
f- The three phases of circuit switching are ------ , ------ , ------.
g- The ------ converts analog signal to analog data and vice versa .

[11-marks]

4- a- What is DCE Stand for? State the common DCE examples.
b- What are the differences between static and dynamic routes?
c- What are the Layers of OSI provide accurate data delivery between computers? State what are those Layers called?

[15-marks]

5- a- Distinguish between Baseband and Broadband transmission. Give an example for each one.
b- Draw the OSI-RM and state the function of each layer.
c- The Dept. of CS&Eng. has three separate Ethernet Network Segments, and five separate Token Ring Networks. Work out the possible fully connection of the eight networks to be as one network. The configurations, including the number and the type of the devices that can be used to make the separate eight networks as one network.

[20-marks]

...Best Wishes...

This exam measures the following ILOs										
Skills	Knowledge & Understanding Skills				Intellectual Skills				Professional Skills	
	a2.1.4.8.16	a2.3.4.8.16	a2.3.4.8.16	a2.1.4.8.16	b2.8.12	b2.8.12	b2.8.12	b2.8.12	c1.2.4	
Question Number	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q5	

Faculty of Electronic Engineering
Computer Science and Eng. Dept.
3rd year
Operating Systems

Final exam (2nd Term)
Time: 3 hours, Full Marks = 70
Date: 28/05/2015
Examiner: Prof. Ayman EL-SAYED

Answer the Following Questions

The First Question (14 marks)

(a) What is the component of a computer system?
(b) What is an Operating System?
(c) What is "Job Pool"?
(d) What is the Process Control Block (PCB)?

The Second Question (14 marks)

(a) Draw a diagram of process states?
(b) What is the cooperating process?
(c) What is the difference between Job and Process?
(d) Define the following: Job scheduling and CPU scheduling?

The Third Question (14marks)

(a) What is meant of CPU and I/O burst times?
(b) What are the operations on process?
(c) What is meant of Time-Sharing and multiprogramming?
(d) What are the CPU scheduling criteria?

The Fourth Question (12 marks)

There is a computer system runs for xx ms. The computer system has 4 process with burst times 80, 30, 50, and 70 ms respectively. All process are executed as follows:

P1 (40ms)	P3 (20ms)	P2 (10ms)	P1 (40ms)	P3 (30ms)	P2 (20ms)	P4 (70ms)

Assume that the PCB of each process is fixed (4 kb) and the transport speed is 1 Mbps Calculate the following:

(a) CPU utilization
(b) Waiting time of each process (P1, P2, P3, and P4).
(c) The needed time of computer system.

The Fifth Question (16 marks)

By using both **first-come, first-serve (FCFS)** CPU scheduling algorithm and **Shortest-job-first (SJF)** CPU scheduling algorithm, explain how to schedule the following processes and in case of both **preemptive** and **non-preemptive**, Calculate the following in both FCFS and SJF scheduling for each Process:

- Average Waiting time of each process. Turnaround time of each process.

Process	arrival-time	burst-time
P1	0	7
P2	1	3
P3	2	8
P4	3	4

With my best wishes

Menoufia University
Faculty of Electronic Engineering
Computer Science and Engineering Department
Third Year – 2nd semester -

Subject : Multimedia
Date : 28/3/2015
Allowed time : 1 hour
Midterm exam- 4 pages

Answer the following questions :

Question One :

a) Distinguish between the two categories of Multimedia .
b) Briefly give ashort note of components of any Multimedia application .
c) What are the different stages of Multimedia application Development ?

Question Two :

a) What is the meant of :-
   Node and Link ? State the different types of links .
b) Give an example of linking information of different media .
c) Differentiate between Hypertext system, Multimedia system , and Hypermedia system

Menoufia University, Faculty of Electronic Engineering,
Computer Science & Engineering Department.
Third Year- First Semester
Elective Course I (Computer Peripherals) (CSE 315)
Examiner: Dr. Salah Eldin Shaban

Mid Term Exam
Date: 23/11/2015
Time: One Hour (from 11 am)
Total Mark: 30 Marks
No. of Pages: Four

Note: The student can get a copy of the PIC18F452 microcontroller data sheet during exam.

اسم الطالب: الرقم الجامعي: الفصل:

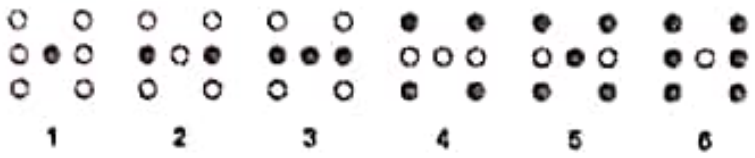
Answer All The Following Questions

First Question — 20 Min/10 Marks

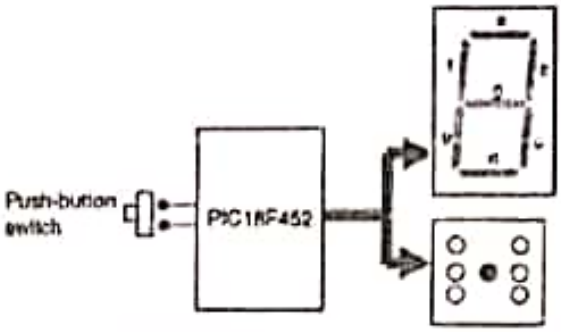
Two LEDs are connected to port pins RC2 and RC3 of a PIC18F452 microcontroller in current sourcing mode with two 290-ohm resistors. A 4 MHz resonator is connected between the OSC1 and OSC2 pins. An external reset push button is connected to the MCLR input to reset the microcontroller when required. Design the hardware interface, list PDL, and write a mikroC program to turn ON the LED which connected to RC2 and flash the other one in 1.8 second delay intervals.

Second Question — *40 Min/20 Marks*

As illustrated in the following block diagram, a simple dice based on LEDs can be driven from **PORTD**, a common anode 7-segment display can be driven from **PORTC**, and a push-button switch can be connected to **RB0** of a PIC18F452 microcontroller which operates with a 4MHz resonator. The dice LEDs are organized such that when they turn ON, they indicate numbers as on a real dice. The dice operates as follows: the LEDs are all OFF to indicate that the system is ready to generate a new number. Pressing the push-button switch generates a random number between 1 and 6 which is displayed on the dice LEDs for three seconds. After three seconds the LEDs turn OFF again. Design the hardware interface, list PDL, and write a mikroC program to operate the dice and at the same time flash each displayed random number two times on the 7-segment display with **0.75** seconds delay intervals.



LED dice



The block diagram

P.T.O.