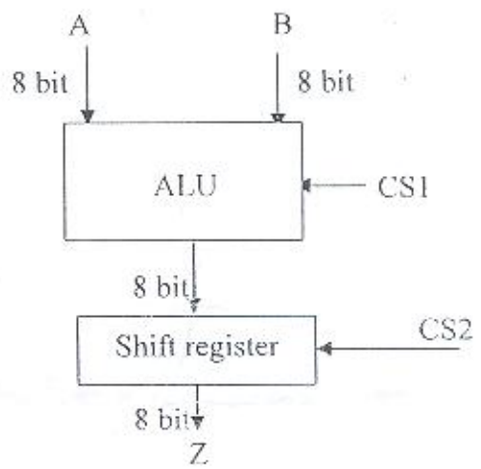
جامعة طنطا
كلية الهندسة
قسم هندسة الحاسبات والتحكم الالى

الفصل الدراسى الاول 2009/2008 الفرقة : الثالثة (لائحة قديمة)
المادة : اختبارات وقياسات
الزمن : 3 ساعة

Answer all the following questions

Q.1) Write a VHDL program using the structural model for the following circuit: ALU performs the following functions (add, subtract, and, or, rotate left). CS1 is a control signal of the ALU functions and CS2 is a control signal of the shift register operation for passing the input data or shift left or shift right.



Q.2) Determine the type of the following VHDL code and its function:
Signal _name' active , **scalar_type' high** , *sla* , **&** , *unaffected* , **to_bitvector(expression)**.

Q.3) State whether each of the following statements is correct or false and correct the false:

a) A constant can be assigned a new value if the new value is equal to the previous one.
b) Process is a specification of a sequential operations describing system behavior.
c) It is possible to check previous values of VHDL signals.
d) Signals are assigned values only when the process suspends.
e) Both signals and variables can be used to store temporal data inside processes.
f) The if …then…. statement can only be used inside processes.
g) If an impulse on a signal line is wider than the delay, an inertial delay model and a transport delay model will give exactly the same results.
h) Each system specified in VHDL is a composition of an entity and an architecture.

تابع الورقة الثانية

i) Execution of a process stops when the end clause is reached. X

j) Since process is an infinite loop thus a wait statement at the beginning of a process plays the same role as one located towards its end. ✓

Q.4) Fill in the table below according to the following VHDL code:

```
process
variable NUM, SUM : integer := 0;
begin
wait for 10 ns;
NUM := NUM + 1;
SUM := SUM + NUM;
end process
```

```
architecture X of Y is
signal NUM, SUM : integer := 0;
begin
process
begin
wait for 10 ns;
NUM <= NUM + 1;
SUM <= SUM + NUM;
end process;
end X;
```

Time	Variables		Signals	
	NUM	SUM	NUM	SUM
0 ns	--	--	--	--
10 ns	--	--	--	--
10+δ	--	--	--	--
20	--	--	--	--
20+ δ	--	--	--	--
30	--	--	--	--
30+ δ	--	--	--	--

تابع الورقة الثالثة

Q.5) Write the appropriate VHDL statement for the following operations:

a) Define an integer variable with a name **Var** and initial value equals to 16.

b) Define a bus with a name **Sig** of 16 bits.

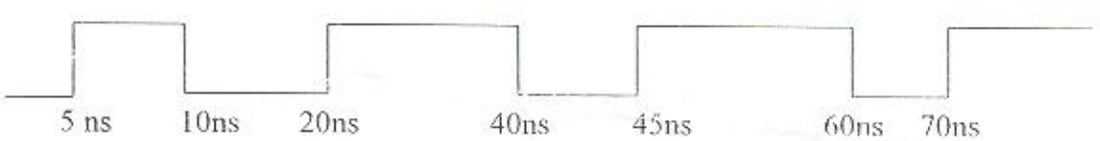
c) Define a new data type with a name **small_int** and the values 1,2,3,4.

d) Shift left the value of the signal **Num** into two positions. M 0 0

e) Test if the clock signal **Clk** is in a rising edge state.

f) Get the last value of a signal **Sum**.

Q.6) Write the VHDL code of a circuit to generate a waveform with the following characteristics and with an enable signal:



مع أطيب التمنيات بالنجاح

أ.د السيد سلام

١/٢/٠ ٣ محاسبات قديم

Tanta University **First term exam (Jan. 2009)**
Faculty of engineering 3rd *year(Old system)* لائحة قديمة
Dept. of Phys. & Eng. Math. *Engineering Mathematics* **Time:3 hours**

Answer The Following

1-Suppose four machines, A,B,C and D produce 0.20, 0.28 ,0.27 ,and 0.25 respectively of the total products in a company . The machines have probability 0.01, 0.02, 0.03, and 0.04 of producing a defective unit. One of these units is selected at random . Find the probability that: i-The unit is defective, ii-The unit was produced by B and defective, iii- The unit was produced by C or D and defective.

2-Given that the discrete random variable X has the mass function

Pr(X= x) = x/6 where x = 1,2,3 and 0 therwise .Describe and graph its cumulative distribution function F(x).

3-Using the normal distribution table , find Pr(-0.47<z<0.94) , φ (- 0.45) , Pr(-0.47<z<0.94) using φ (-0.47) , φ (0.94) .

4-Find the regression line for the following data

x	2	3	5	4	6	5
y	1	3	2	5	7	4

5- The following are the data for control group C and experimental group E. Do the two means differ significantly?, at level $\alpha = 0.05$.

C	5	3	2	3	1	4
E	7	4	1	4	2	6

t (10 , 0.025)=2.228

6-If a random variable x is normally distributed with mean 118 and a standard deviation 11, find

- the z-scores of 115,134 and 99.

-P(115<x<123) , P(-115<x<115) , P(x<115) , P(115<x)

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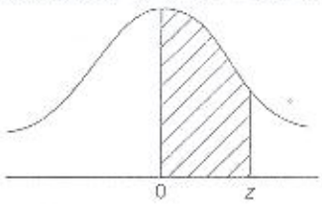
t (10 , 0.025)=2.228



$z = \frac{x - \bar{x}}{\sigma}$	0	1	2	3	4	5	6	7	8	9
0.0	0.0000	0.0040	0.0080	0.0120	0.0159	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0678	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1388	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2086	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2760	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3451	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4430	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4762	0.4767
2.0	0.4772	0.4778	0.4783	0.4785	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4980	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990
3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
3.2	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998
3.5	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998
3.6	0.4998	0.4998	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999
3.7	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999
3.8	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999
3.9	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000

١٢cc

جامعة طنطا – كلية الهندسة
قسم هندسة الحاسبات والتحكم الآلي
امتحان الفصل الدراسي الأول للعام الجامعي ٢٠٠٨ / ٢٠٠٩

الفرقة الثالثة حاسبات (قديم)
المادة : المعالجات الدقيقة
الزمن : ثلاث ساعات يناير ٢٠٠٩

Answer the following questions:

Q(1): Put (☑) for true statement or (x) for false statement (13 degree)

[1] The 80386 was 16-bit microprocessor.
[2] The memory system is divided into TPA, XMS.
[3] A bus is set of common connection lines that carry the same type of information.
[4] In real mode, segments can begin at any location in the memory system.
[5] The global descriptor table is a maximum 8192 bytes in length.
[6] MOV BL, AX
[7] MOV CS, BX
[8] PUSH AX is equivalent to PUSH EAX
[9] A memory segment can touch or even overlap.
[10] MOV ES, DS
[11] MOV [DI], [BX]

Q(2): **[a]** Draw the internal architecture of the microprocessor 80386 then describe the use of all registers. (15 degree)

[b] Comparison in detail between: (15 degree)

1) The real mode operation and the protected mode operation.
2) The 16-bit instruction and the 32-bit instruction.
3) The local descriptor and the global descriptor.

Q(3): **[a]** In the microprocessor 80286, explain the main data addressing modes and give an example for every one. (14 degree)

[b] In a machine language instruction, what is specified by the MOD field? And the R/M field? (8 degree)

Q(4): **[a]** Suppose that DS = 0400H, BX = 0200H, SS = 0800H, SP = 0001H, and DI = 0300H. Determine the memory address accessed by each of the following instructions, assuming real mode operation: (12 degree)

1) MOV AX, [3210]
2) PUSH BX
3) MOV AX, [BX]

[b] Describe the purpose of the D and W bits found in some machine language instructions. (8 degree)

مع أطيب الأمنيات بالتوفيق

Tanta University, Faculty of Engineering, Computer and Control Engineering Dept., Subject: Data Structures and Algorithms	Final Written Exam Third Year Computer (old) Date: 25 / 01 / 2009 Time: 3 Hours

Answer the following questions:

First question:

(a) Write the general syntax of declaring *Structures* and *Arrays*?
(b) Write an algorithm to multiply two square matrices X and Y of n numbers.
(c) Write a C++ program to create a database of students. Each student is defined by identification number (*ID*), name (*name*), and telephone (*tel*). By using *pointer* to the database, allow a user to input data of 20 students from the keyboard and then prints the database on the screen.

Second question:

(a) What is a linked list? Show how you declare a node of a linked list containing a data part and a pointer to next node?
(b) Write an algorithm to perform each of the following operations on a list:
  (i) Append a node after the first node of a linked list.
  (ii) Delete the end node from a linked list.
  (iii) Display the contents of the 3rd node in the list.

Third question:

(a) Show how you can represent *Stack* in C++ programs.
(b) Write an algorithm to implement *pop* operation.
(c) Write an algorithm to implement *stacktop* operation.

Fourth question:

(a) Show how you can represent *Queue* in C++ programs.
(b) Write a function to implement *empty* operation.
(c) Write an algorithm to implement *insert* operation.

Fifth question:

(a) Write a function to recursively compute the factorial of a given number n.
(b) What is the main idea of *Bubble sort*?
(c) Write a *Bubble sort* algorithm to sort a list of numbers.
(d) Show the actions done, step-by-step, when sorting the following list by *Quicksort*:

27 10 12 20 25 13 15 22

«With my best wishes»

Tanta University
Faculty of Engineering
Time : 3 Hours.

3rd Year (old sy.) Comp. Eng
Electrical Communications
Jan. 2008.

Answer the following Questions:

1. (a) Sketch the simplified block diagram of an analog communications system and explain its operation.

   (b) A communication system with a preamplifier of noise figure 2 dB and gain 10 dB is connected with a cable of noise figure F = 4 and gain 0.5 dB to a receiver of gain 60 dB and noise figure F = 12 dB. Determine the overall noise figure of the system.

---

2. (a) Sketch the block diagram of integrated circuit waveform generator and explain its operation

   (b) Sketch the block diagram of a PLL and describe how loop acquisition is accomplished with a PLL from an initial unlocked condition until frequency lock is achieved

   (c) Determine the hold- in range for a PLL with an open loop gain of K_L =20 kHz / rad

---

3. (a) Sketch the block diagram of a multiple crystal frequency synthesis and explain its operation.

   (b) Describe the relationship between the carrier and sideband powers in an AM DSBFC wave. .

   (c) For an AM DSBFC modulator with carrier frequency f_c = 100 kHz and a maximum modulating signal $f_{m(max)}$ = 5 kHz , determine
   (i) Frequency limits for the upper and lower sidebands.
   (ii) Bandwidth
   (iii) Upper and lower side frequencies produced when the modulating signal is a single frequency 3 kHz.

---

4. (a) Sketch the block diagram of a high level AM DSBFC transmitter and explain its operation.

   (b) For a receiver with IF ,RF, and local oscillator frequencies of 455 kHz,1100 kHz, and 1555 kHz, respectively ,determine
   (i) Image frequency
   (ii) Image frequency rejection ratio for a preselector Q = 100

   (c) Determine the net receiver gain for an AM receiver with the following gains and losses: RF amplifier = 30 dB , IF amplifier = 44 dB, Audio amplifier = 24 dB , preselector loss = 2 dB, mixer loss = 6 dB , detector loss = 8dB

Good Luck

جامعة طنطا
كلية الهندسة
قسم الحاسبات والتحكم الالى

امتحان الفرقة الثالثة
تنظيم صناعى (لائحة قديمة)

الزمن : ساعتان
2009 /1/29

اجب عن الأسئلة الآتية:-

1- ما هي العوامل (العناصر) الرئيسية التى تؤثر على تكلفة الانتاج وتكلفة الاستثمار؟ وما هى نقطة التعادل بالنسبة للمشروع الصناعى وأهمية تحديدها؟

2- تعتمد الحسابات المالية للمنشآت الصناعية على نظام لتسجيل الايرادات والمصروفات وصولا الى الميزانية العمومية للمنشأة ، وما هى الخطوات الواجب اتباعها فى عمليات التسجيل وصولا الى بيان الميزانية العمومية ومكوناتها الرئيسية؟

3- تهتم السلامة الصناعية (الامن الصناعى) بحماية عناصر الانتاج ، بين مكونات عناصر الانتاج فى المشروعات الصناعية وكيف يمكن حمايتها من المخاطر ومن الحوادث؟

4- هناك عناصر اساسية ، وعناصر ضرورية ، وعناصر لازمة (هامة) تدخل جميعها فى عمليات التصنيع، ما هى مكونات تلك العناصر الثلاث.

5- يوضح الجدول التالى حركة المخزون للمواد التى تدخل فى عمليات التشغيل فى مشروع صناعى:-

التاريخ	سعر الشراءS/ طن	المواد الداخلة بالطن	الرصيد بالطن
2008/2/5	120	10000	10000
2008/4/12	130	12000	22000
2008/7/16	145	8000	30000
2008/10/12	150	5000	35000

احسب تكلفة التكلفة التقديرية لعدد 42000 طن من المواد باستخدام الطرق الثلاث لتقدير تكلفة المواد المستخدمة فى عمليات التشغيل.

٣ حاسبات قديم
اسس التحكم الالى

TANTA UNIVERSITY
FACULTY OF ENGINEERING

Department : Computer and Control Engineering
Lecturer : Professor Ahmed F. Amer
Subject : Automatic Control Engineering **Marks : 85**
Date : 15 / 1 / 2009 **Time : 3 Hrs**

Final Exam

Answer the Following Questions:

1.a) For the schematic diagram of the antenna position control system shown in Fig.1 below: i- obtain the open-loop T.F. relating the angular velocity of the load to a step-voltage input to the power amplifier. Find in this case, the damping ratio and natural frequency in terms of the system parameters.
ii- derive the closed loop system transfer function relating the input angular position to the output angular position.

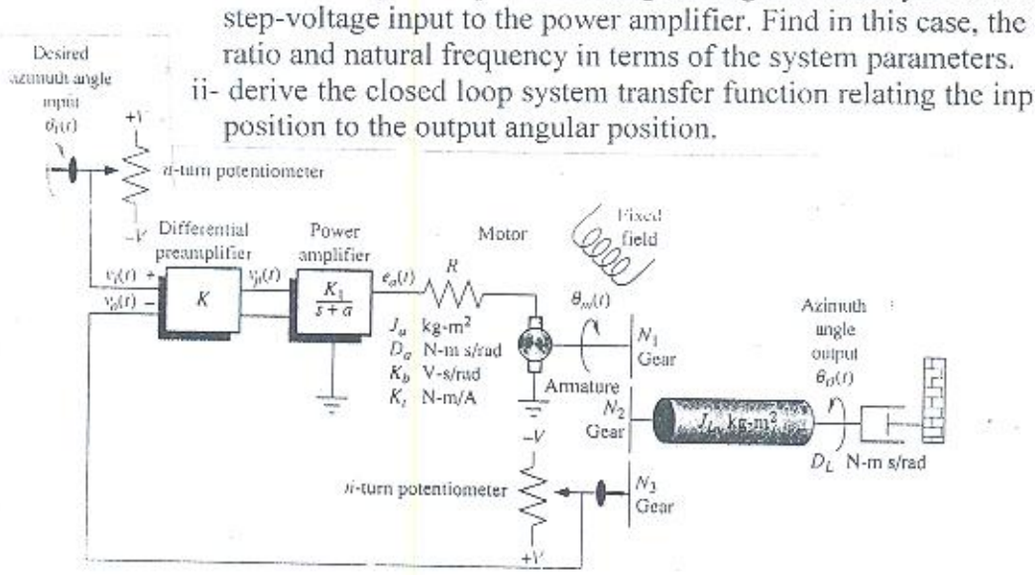


Fig.1

2.a)Find the transfer function, $G(s)=V_L(s)/V(s)$, for the network shown in Fig.2 below.

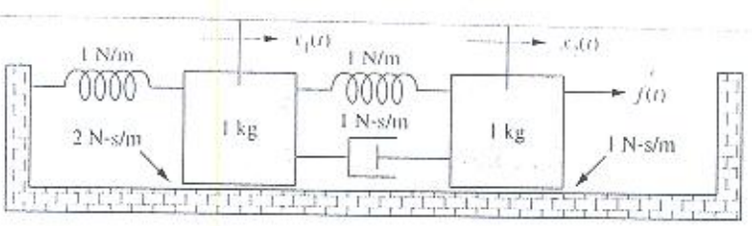


Fig.2

b) For the system of Fig.3 find the transfer function, $G(s)=X_1(s)/F(s)$.

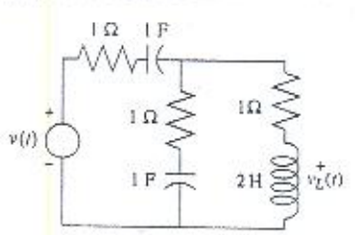


Fig.3

3.a) Given the unity feedback control system whose transfer function G(s) where,

$$G(s)=\frac{k(s-1)(s-2)}{(s+2)(s^2+2s+2)}$$

find the following

i- the range of k that keeps the system stable.

ii- The value of k that makes the system oscillate.

iii- The frequency of oscillation when k is set to the value that makes the system oscillate.

b) The open-loop transfer function of a unity feedback system G(s) is given by,

$$G(s)=\frac{k(s+12)}{(s+5)(s+10)}$$

find value of k to yield a steady – state error of 0.1 for a ramp input 50tu(t)

4 . a) For the open-loop transfer function of a unity feedback system G(s) is given by,

$$G(s)=\frac{k(s+3)}{s(s+1)(s+2)(s+4)}$$

Sketch the root locus.

5. a) Using the Nyquist criterion for the unity feedback system given by its transfer function G(s) where,

$$G(s)=\frac{k}{s(s+3)(s+5)},$$

find the range of gain , k, for stability, instability, and the value of gain for marginal stability. For marginal stability, also find the frequency of oscillation.

b) Draw the Bode log-magnitude and phase plots of G(s) for the unity feedback system, where,

$$G(s)=\frac{(s+3)}{(s+2)(s^2+2s+25)}$$

Find also the system gain margin and the system phase margin.