جميع التخصصات لائحة قديمة   ٤ اتصالات قديم

جامعة طنطا
كلية الهندسة
قسم هندسة الإنتاج والتصميم الميكانيكي

المادة/ دراسات الجدوى للمشروعات
الفرقة الرابعة (الاقسام الكهربية)
لائحة قديمة

بسم الله الرحمن الرحيم
التاريخ : 29/ 1/ 2009
الزمن : ساعتان

أجب عن الأسئلة الآتية:- (40 درجة)

السؤال الأول:-

1- الجدوى التسويقية هى إحدى مكونات دراسة الجدوى الاقتصادية - تكلم باختصار عن الجدوى التسويقية.
2- تكلم بالتفصيل عن عناصر التصنيع.

السؤال الثانى: -

1- يمكن تقسيم المصنع على حسب طرق عمليات الانتاج والتخطيط الى ثلاثة أقسام رئيسية اكتب نبذة مختصرة عن هذه الأقسام.
2- تكلم عن أهم:-
(ا)- العوامل المؤثرة فى حجم مرونة الطلب.
(ب)- العوامل التى يترتب عليها نقصان أو زيادة العرض.
3- ما المقصود بكل من :-
1- شركة التضامن
2- الشركة المساهمة
مع شرح لأهم مزايا وعيوب كل نوع.

السؤال الثالث:-

1- المقصود ب المخزون - ولماذا نحتفظ بالمخزون؟
2- ما المقصود بالجودة - اشرح باختصار مراحل تطور الرقابة على الجودة .

مع أطيب التمنيات بالنجاح
ا.د/عبد الفتاح مصطفى خورشد

رابعة : اتصالات (قديم)
مقرر النمذجة والمحاكاة

Tanta University
Faculty of Engineering
Dept. of Electronics & Communication Eng
Subject: Modeling & Simulation (4th year)

Date: /1/2009
Time allowed: 180 Min.
Full Mark: 85 Mark
Final Term Exam (First Semester)

Answer Only Five Questions (ملحوظة هامة: الأسئلة في ورقتين)

The First Question

(a) Single layer Perceptrons are limited in the class of input-output mappings they can perform. Identify that class, and give one simple example of a problem within that class, and one simple example from outside that class.

(b) Let us consider pattern classes C1 and C2, where C1: {(0,2), (0,1)} and C2: {(1,0), (1,1)}. Determine and obtain a decision surface based on perceptron learning. The 2-D graph for the above data is shown in Fig. 1.

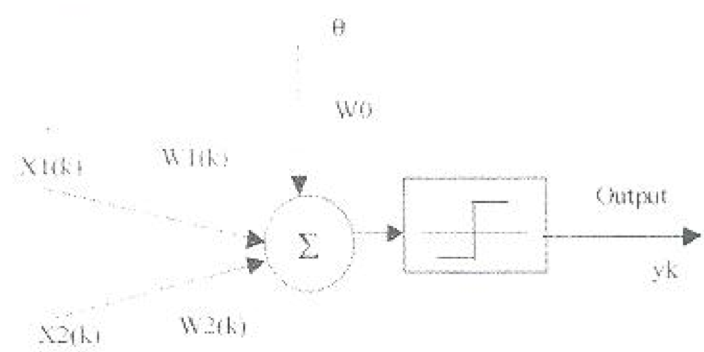


Fig. 1. Perceptron Structure.

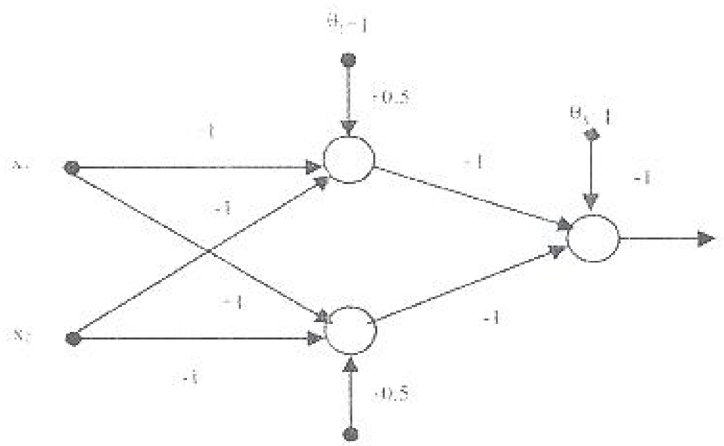
The Second Question

(a) What is the difference between Linearly Separable Patterns and Non-Linearly Separable Patterns.

(b) Suppose weights and biases are selected as shown in Fig. 2. The McCulloh-Pitts model represents each neuron (binary hard limit activation function).

a. Show that the network solves XOR problem.

b. Draw the decision boundaries constructed by the network.



2- Show that the network solves XOR problem.
3- Draw the decision boundaries for hidden layer constructed by the network.

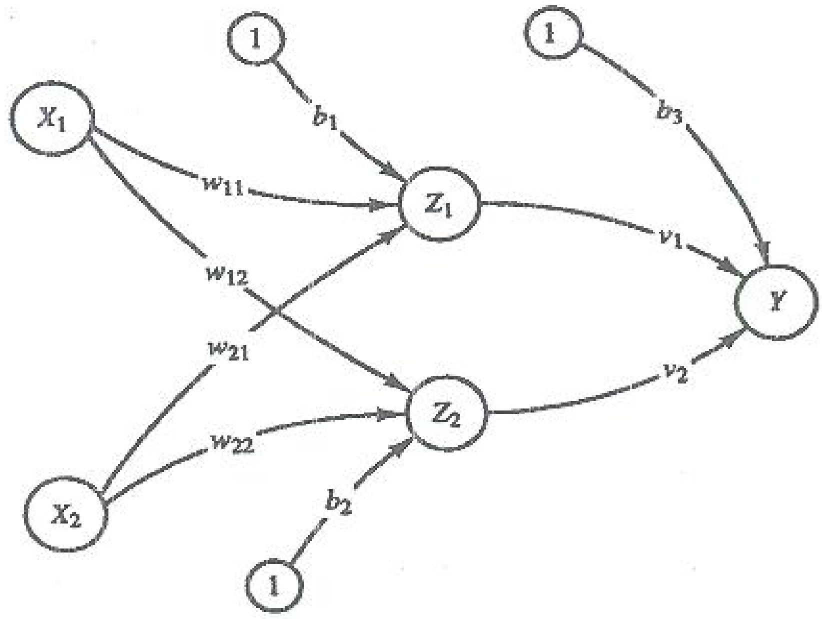


Fig. 2. MADALINE with two hidden ADALINES and one output ADALINE.

With my best wishes

The Third Question

(a) Explain what the following equation, and each symbol in it, represents:

$$\xi = \langle d_k^2 \rangle + \mathbf{w}^t \mathbf{R} \mathbf{w} - 2\mathbf{p}^t \mathbf{w}$$

(b) Show that the minimum value of the mean squared error can be written as

$$\xi_{min} = \langle d_k^2 \rangle - \mathbf{p}^t \mathbf{w}^*$$

The Fourth Question

(a) Given examples, $(x_1, d_1), (x_2, d_2), \ldots, (x_L, d_L)$, of some processing function that associates input vectors, x_k, with the desired output values, d_k. Derive an expression for the best weight vector, w* (optimum weight vector) using LMS, for an ALC that performs this mapping.

(b) Suppose we have an ALC with two inputs and various other quantities defined as follows:

$$R = \begin{bmatrix} 3 & 1 \\ 1 & 4 \end{bmatrix} \quad \mathbf{p} = \begin{bmatrix} 4 \\ 5 \end{bmatrix} \quad \langle d_k^2 \rangle = 10$$

a. Find the optimum weight vector.

b. Determine an explicit equation for ξ as a function of w_1 and w_2

c. Find $\nabla\xi$, the minimum mean squared error ξ_{min}, and prove that the paraboloid is concave upward.

$$\xi_{min} = \langle d_k^2 \rangle - \mathbf{p}^t \mathbf{w}^*$$

The Fifth Question

(a) Compare between Adaline and Madaline.

(b) Suppose the use of the MRI algorithm to train a MADALLNE to solve the XOR problem as shown in Fig. 2. The training patterns are:

x_1	x_2	t
1	1	−1
1	−1	1
−1	1	1
−1	−1	−1

The initial weights and biases are selected as shown below

Weights into Z_1			Weights into Z_2			Weights into Y		
w_{11}	w_{21}	b_1	w_{12}	w_{22}	b_2	v_1	v_2	b_3
.05	.2	.3	.1	.2	.15	.5	.5	.5

The learning rate is 0.5.

1- Show the computations for the first weight updates.

ع اتصالات (قديم) اختبارات وقياسات الكترونية

١/٢٠

Tanta University
Faculty of Engineering
Electronics& Communications

4th Year, Time allowed:3Hr.
Elect.Testing&Measurements
Date: 20 /01/2009.

Answer the following questions:

1. a) Explain the sampling theorem mathematically and graphically assuming the input is a sine-wave signal with a freq. of 4 kHz.

b) Illustrate aliasing effect, and show how this effect can be avoided.

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2. a) Construct the circuit diagram of D∑M ,define the slope overload noise, and hence find the step size required to prevent this noise for the input signal is $m(t) = 5 \sin 2\pi(600)t$.

b) Set up an experiment for generating the PAM and PTM, using the block diagrams. Hence, draw and discuss the generated and measured each stage.

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3. a) Draw a practical simplified block diagram of a PCM system.

b) Explain how the intelligence signal m(t) can be recovered from the PPM.

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4. If the following binary sequence 110010101 is the input to the PCM receiver module, what data will be detected. If the PCM channel is corrupted by noise, show graphically how to simulate this noise experimentally.

=================== ***Good Luck, Prof. M. Nasr*** ===================

ب اتصالات قديم   نظم الاتصالات الرقمية

Tanta University
Faculty of Engineering (لائحة قديمة)
Dept. of Electronics and Electrical Comm.

B Sc. 1st term Exam.
Digital Comm. systems
Time allowed : 3 Hour

Attempt with the following questions:

1- Write short notes about;
Signal regeneration advantage of digital communication- Synchronous and Asynchronous multiplexing- Bandwidth disadvantage of PCM over PAM – Super group formation.

2- a- Show with wave forms the result of sampling a 5 k Hz signal at an 8 k Hz rate.
b- Explain how could you obtain PPM signal from PWM one.

3- A binary channel with bit rate 36 kbps is used for PCM voice transmission. Find the number of quantizing levels for the base band signal; $V(t) = 4 \sin 6.4 \pi t$.
Assume the channel is noisy with bit error rate of 10^{-4}. What is the average Signal-to-noise ratio of the recovered signal.

4- a-A TV signal has a band width of 4.2 MHz is converted to a PCM signal. What bit rate is required for SN_qR of 30 dB? Compare this bit rate with that of voice signal at the same SN_qR. Comment.
b- A song is to be recorded by sampling and storing the sampled values. The highest frequency tone to be recorded is 15.8 k Hz, with 1.5 volt amplitude.
1- How many samples are required to store a three minutes performance.
2- If each sample is quantized into 128 level, how many bits are required to store the three minutes performance.
3- Calculate the bandwidth required for PCM transmission of four multiplexed such a song.
4- Calculate the signal-to-quantization noise ratio.

5-a- Explain the following;
1- PSK signal could be transmitted as a suppressed carrier signal to save its power.
b- Draw the block diagram of;
1- BPSK modulator, 2- Delta modulator
Explaining the function of each block.
c- For a 8-PSK modulator with a carrier frequency of 70 MHz and an input bit rate of 10 Mbps, compare between; the Nyquist BW and the baud rate.

رابعة إتصالات نظام قديم
تصميم هوائيات

TANTA UNIVERSITY
FACULTY OFENGINEERING
ELECTRONICS&COMMUNICATIONS DEP.
SUBJECT: ANTENNAS DESIGN   FINAL EXAMINATION

JANUARY 2009
TIME ALLOWED: 3 HOURS
4th YEAR COMMUNICATION
(لائحة قديمة)

Attempt all questions:

1- a- (1)Write the general expression for the far field radiation from the long wire antenna, then obtain an expression for the far field pattern of $\lambda/2$ dipole.

(2) Plot the radiation pattern and evaluate the directivity, radiation resistance, effective length and beam width of the following linear antennas:

i- A dipole of length 25 cm, operating at 100 MHz

ii- A monopole of height 75 m, operating at 1 MHz

iii- A folded dipole of length 5 cm, operating at 300 MHz.

b- (1) Write an expression for the far field radiation from a loop antenna assuming constant current.

(2) Plot the far field patterns and evaluate R_{rad}, D and beam width for the following cases:

i- A loop antenna of radius 40 cm operating at 1200 MHz.

ii- A loop antenna of radius 10 cm operating at 600 MHz.

c- Write down the far field radiation pattern of a **traveling wave antenna** with length L, and then, plot its pattern if $L=4\lambda$ tabulating the directions of nulls, peaks and relative peak amplitudes, then design its rhombic antenna.

2- a-**Write down** an expression for the array factor of a linear uniform array consisting of N elements.

b- For a linear uniform array that consists of 8 elements (short dipoles) placed on the Y-axis separated by $\lambda/2$ spacing and oriented towards Z-axis ,obtain and sketch the total field pattern in the X-Y , X-Z and Y-Z planes in the following cases :

$i-\alpha=0$ $ii-\alpha=-\pi$ $iii-\alpha=\pi/2$

3- a- **Write down** an expression for the array factor of the **non-uniform linear array** with symmetric feeding in the case of **even number of elements**.

b- For a **8 elements Binomial broadside array** consisting of short dipoles placed on Z-axis that oriented towards the Y-axis and separated by $\lambda/2$ spacing:

i- Estimate the elements relative feeding coefficients

ii- Plot the array factor as well as the total field pattern in the Z-X and Y-X planes

c- For a **4 elements End fire Tcheby-chave array** having **-15 dB SLL** and the elements are short dipoles placed on X-axis that oriented towards the Z-axis with $\lambda/2$ spacing:

i- Obtain the elements relative feeding coefficients

ii- Plot the array factor as well as the total field pattern in the Z-X and Y-X planes.

4- a- For a **6x4 elements** (short dipoles oriented to Y-axis) **planar array** placed in the x-y plane with $d_x=d_y=\lambda/2$ and having the main lobe oriented towards ($\theta_o=0^o$ *and* $\phi_o=90^o$)

Plot the array factor as well as the total field pattern in the Z-X , Z-Y and Y-X planes

b- **i-** Write down an expression for the array factor of a circular array placed in the X-Y plane , then, Estimate the **8 elements** phases(α_n) required to orient the main lobe to

($\theta_o=30^o$ *and* $\phi_0=60^o$) if the radius of the array is 5λ .

ii- Sketch the principal pattern for a uniform feeding broadside circular array of **6 elements** and a radius of 5λ,where the elements are short dipoles oriented towards X-axis .

"رب اشرح لي صدري ويسر لي أمري"   *Dr. Abdel-Fattah A. Abu-Hashem*

إرسالها التقدم

<table>
<tr><td rowspan="4">Academic Year 2008/2009</td><td colspan="3">Faculty of Engineering- Tanta University</td></tr>
<tr><td colspan="2">Communications and Electronics Department</td><td>Final Exam - 4th Year</td></tr>
<tr><td></td><td>Microwave Electronics</td><td>January, 2009</td></tr>
<tr><td>Examiner:</td><td>Dr. Mohamed. Abd El-Rahman</td><td>Time allowed: 3 hrs.</td></tr>
</table>

Answer ALL Questions — Neat Answers and boxed Results are appreciated

Question(1)

a) Derive an expression for the round trip dc transit time in the reflex klystron.

b) A reflex klystron oscillator operates under the following conditions.

$V_o = 200\text{V}, I_o = 23\text{ mA}$, V_1= 40V(rms) and $(e/m) = 1.759\times10^{11}$[MKS system]

The tube is oscillating at f_r at the peak $n = 2$ mode. Find the following:

i) the output power in watts (θ_g is very small).

ii) the frequency of oscillation.

iii) the output power at maximum efficiency.

Question(2)

a) Explain the process of velocity modulation in a two cavity klystron.

b) A two identical cavity klystron amplifier operating at $V_o = 900\text{ V}$, $I_o = 20\text{mA}$. If $X = 1.5$, $J_1(1.5) = 0.58$ and signal frequency is 2 GHz, DC transit time T_o is 2.248 ns and the amplifier has a power gain of 14dB. Determine:

i) minimum and maximum beam velocities.

ii) the distance between two cavities.

iii) the current arriving at the catcher cavity if $(\omega t_o + \theta_g/2 = \pi/3)$,

iv) the value of output shunt resistance if $\beta_i = 1$.

Question(3)

a) Derive an expression for the circuit equation in a TWT amplifier.

b) Write down the four propagation constants in the TWT amplifier and compare between them.

c) A traveling wave tube operates under the following parameters:

Beam voltage $V_o = 2\text{kV}$, Beam current $I_o = 4\text{mA}$, characteristic impedance of the helix $z_o = 20\,\Omega$, circuit length $N = 50$ and frequency $f = 8\text{GHz}$. Determine:

i) gain parameter C.

ii) output power gain A_p in dB.

iii) all four propagation constants.

Question(4)

a) Derive an expression for the equivalent negative conductance of the tunnel diode circuit.

b)The tunnel diode equivalent circuit parameters are: series resistance $R_s = 4\Omega$, junction capacitance $C_j = 1\text{ pF}$, and negative resistance $R_n = -70\,\Omega$. The diode is placed in a cavity to operate as an amplifier at center frequency 3GHz. The total cavity capacitance is 2.5pF with load and source resistances $R_L = R_g = 50\Omega$. Find the following

i) the equivalent shunt negative conductance of the diode at that frequency.

ii) the amplifier power gain

iii) the amplifier bandwidth.

iv) the frequency at which the equivalent conductance of the diode vanishes

Question(5)

(a) Derive an expression for the input and output reflection coefficients $\Gamma_{in}, \Gamma_{out}$ of the microwave amplifier network.

(b) An Amplifier is characterized by the following S-parameters:

$S_{11} = 0.78\angle -65^o$, $S_{12} = 0.11\angle -21^o$, $S_{21} = 2.2\angle 78^o$ *and* $S_{22} = 0.9\angle -29^o$. The input side of the amplifier is connected to a voltage source with $V_s = 4V\angle 0^o$, and impedance $Z_S = 65\Omega$. The output is utilized to drive an antenna that has an impedance of $Z_L = 85\Omega$. Assuming that the S-parameters of the amplifier are measured with reference to a ii) the distance between two cavities L. $Z_o = 75\Omega$ characteristic impedance, find the following quantities:

(i) matched transducer gain G_{TM}, unilateral transducer gain G_{TU} and available power gain.

(ii) power delivered to the load P_L and the maximum power available from the source P_{avs}.

You may use the following relations:

Stability gain factor: $k = \dfrac{1-|S_{11}|^2 - |S_{22}|^2 + |\Delta|^2}{2|S_{12}S_{21}|}$, Delta factor: $\Delta = S_{11}S_{22} - S_{12}S_{21}$

Transducer power gain $G_T = \dfrac{1-|\Gamma_S|^2}{|1-\Gamma_{in}\Gamma_S|^2}|S_{21}|^2\dfrac{1-|\Gamma_L|^2}{|1-S_{22}\Gamma_L|^2}$ or $G_T = \dfrac{1-|\Gamma_S|^2}{|1-S_{11}\Gamma_S|^2}|S_{21}|^2\dfrac{1-|\Gamma_L|^2}{|1-\Gamma_{out}\Gamma_L|^2}$

Available power gain .... $G_A = \dfrac{1-|\Gamma_S|^2}{|1-S_{11}\Gamma_S|^2}|S_{21}|^2\dfrac{1}{|1-|\Gamma_{out}|^2|}$

BEST OF LUCK FOR ALL,
Dr. Mohamed Abdel-Rahman