كلية الهندسة
جامعة طنطا

امتحان مادة (الادارة والتسويق)
الزمن (ساعتان)

العام الجامعى ٢٠١١/٢٠١٢
تاريخ الامتحان ٢٠١٢/١/٢٦

اجب عن الأسئلة التالية:

٣ اسئلة

السؤال الأول

١) اشرح مع الرسم دورة حياة المنتج
٢) اشرح بالتفصيل المفاهيم التى تتحكم فيها ادارة التسويق

السؤال الثانى

١) فى ضوء الفلسفة الحديثة للتسويق ..... عرف التسويق
٢) ما المقصود بالمراجعة التسويقية
٣) ارسم مخطط يوضح المزيج التسويقى والأنشطة التى يتحكم فيها

السؤال الثالث

١) ما هى الأشكال المختلفة للمنتج مع ذكر مثال على كل منها
٢) اشرح مع الرسم البيئة التسويقية شرحا مفصلا

السؤال الرابع

١) ما هى العوامل التى تؤدى الى صعوبة التنبؤ بالطلب
٢) ما هى المتغيرات الرئيسية التى تتحكم فيها ادارة التسويق مع الشرح
٣) ما المقصود بالمزيج التسويقى وما هى الأنشطة التى يشتمل عليها
٤) يعتبر التسويق علم حديث النشأة..... اذكر الاسباب التى أدت الى ظهوره ونشأته

السؤال الخامس

١) ما المقصود بالبيانات الثانوية وما هى امثلة البيانات الثانوية اللازمة لدراسة الجدوى وما هى الشروط التى يجب توافرها فى هذه البيانات حتى تكون صالحة ومناسبة للدراسة
٢) ما هى المفاهيم الخاصة برفع كفاءة الادارة التسويقية مع الشرح

the fiber splicing methods. What are the main requirements for fiber connector design? Explain the extended beam connector.

Question 5: **(Answer two points only)**

a- Sketch the different lensing schemes for optical fiber coupling improvement. What is the difference between the imaging sphere and the non-imaging microsphere? Find an expression for the coupling efficiency of a nonimaging microsphere.

b- Derive the lasing conditions of a laser diode. A GaAlAs laser diode has a 500 μm cavity length, which has an effective absorption coefficient of 10 cm^{-1}. For uncoated facets the reflectivities are 0.32 at each end. What is the optical gain at the lasing threshold? If one end of the laser is coated with a dielectric reflector so that its reflectivity is now 90%, what is the optical gain at the lasing threshold?

c- Find an expression for the efficiency of coupling between a Lambertian source and an optical fiber. Consider only the case when the source area is smaller than the core area. How can the coupling efficiency be enhanced? What is the maximum possible enhancement? Why?

Question 6: **(Answer two points only)**

a- What are the sources of error in the optical receiver? Find an expression for the probability of error in a digital optical receiver. What is meant by the quantum limit?

b- Explain the different fiber fabrication methods.

c- Explain the mechanisms by which radiative losses occur in optical fibers. Suggest solutions for this problem.

Best wishes.

Tanta University | **Opto-Electronics**
Faculty of Engineering | **Date: 15-1-2011**
Dept. of Communications | **Third Year**
Time Allowed: | **3 hours**

Answer the following questions:

Question 1: **(Answer two points only)**

a- Define the refractive index of a medium. State Snell's laws for reflection and refraction, and hence find an expression for the critical angle between two media and the numerical aperture of an optical fiber. Calculate the numerical aperture of a step index fiber having n_1=1.48 and n_2=1.46. What is the maximum entrance angle of this fiber if the outer medium is air with n=1?

b- Explain the mechanisms of attenuation in optical fibers, and hence sketch the attenuation curve versus the wavelength and explain the behavior of the curve.

c- Compare between the different fiber fabrication materials.

Question 2: **(Answer two points only)**

a- What is meant by dispersion of light in optical fibers? Explain the types of dispersion in optical fibers. Find an expression for the dispersion.

b- A double hetrojunction InGaAsP LED emitting at a peak wavelength of 1310 nm has radiative and nonradiative recombination times of 25 and 90 ns, respectively. The drive current is 35 mA. Find the internal quantum efficiency and the internal power level. If the refractive index of the light source material is n=3.5, find the power emitted from the device.

c- Explain how the information capacity of an optical fiber is related to its bandwidth and length.

Question 3: **(Answer two points only)**

a- Sketch the equivalent circuit of the optical receiver and find an expression for its impulse response. Why is the Fourier transform used for the analysis of this receiver?

b- What are the different uses of the optical fiber amplifiers? Why is a pump used in optical amplifiers? Explain with the aid of sketches the idea of operation of the EDFA.

c- Explain the effect of radiation on optical fibers. Is the effect of ionizing radiation similar to non-ionizing radiation? Why?

Question 4: **(Answer two points only)**

a- What are the types of index guided lasers? Explain the mechanisms of making these index-guided lasers.

b- Explain the process of laser diode modulation.

c- How are fiber end faces prepared? What are the types of deformations in fiber end faces? Explain with the aid of sketches

Question.5 (17 Marks)

a) Design a MOD-7 synchronous binary counter using JK flip-flops. Determine what happens if the count goes into the unused state and show the results on a state diagram. (6 Marks)

b) An eight bits SISO shift register is clocked at 100 kHz. How long will the data be delayed in passing through this register? (3 Marks)

c) How many flip-flops are required to construct MOD-10 ring and Johnson counters? Also write the count sequence in the two cases. (4 Marks)

d) A four-bit ring counter and a four-bit Johnson counter are clocked by a 10 MHz clock signal. Determine the frequency and duty cycle of the output of the output flip-flop in the two cases. (4 Marks)

Question.6 (17 Marks)

a) What is the output voltage of a ladder DAC for a binary input 1010. What is the advantage of this type of DACs. (4 Marks)

b) An eight-bit D/A converter produces an analogue output of 12.5 mV for a digital input of 00000010. Determine the analogue output for a digital input of 00000100.Find also the full scale output voltage. (4 Marks)

c) Sketch the block diagram of a 3-bit flash converter, and state its advantages and disadvantages. (5 Marks)

d) Why a dual-slope integrating-type A/D converter has a higher accuracy than other types of A/D converter? (4 Marks)

Good Luck , Dr. Roayat Ismail

Electronics and Electrical Comm. Dept.
Total Marks: 90 Marks

Digital Electronics in Comm. Systems	Course Code: EEC3111	Year: 3rd
Date: Jan., 8th 2012	Allowed Time: 3hrs	No. of Pages: (2)

Answer the following Questions:

Question.1 (10 Marks)

Implement the three-variable Boolean function $F(A, B, C) = \sum m(1, 3, 5, 6)$ using

a) An 8-to-1 multiplexer.
b) A 4-to-1 multiplexer.
c) A decoder and external gates.

Question.2 (14 Marks)

The data sheet of a quad two-input TTL gate specifies the following parameters (absolute values): I_{OH}(max.) = 0.4 mA, V_{OH}(min.) = 2.7 V, V_{IH}(min.) = 2V, V_{IL}(max.) = 0.8 V, V_{OL}(max.) = 0.4 V, I_{OL}(max.) = 8 mA, I_{IL}(max.) = 0.4 mA, I_{IH} (max.) = 20 μA, I_{CCH}(max.) = 1.6 mA, I_{CCL}(max.) = 4.4 mA, $t_{pLH} = t_{pHL}$ =15 ns and a supply voltage range of 5 V.

a) Explain why I_{IL}(max.) is larger than I_{IH} (max.). (3 Marks)

b) Determine:
- the average power dissipation of a single gate (consider 75% duty cycle). (3 Marks)
- the maximum average propagation delay of a single gate. (2 Marks)
- the HIGH-state and LOW-state noise margin . (3 Marks)

c) How many gate inputs can be driven from the output of this TTL gate? (3 Mark)

Question.3 (18 Marks)

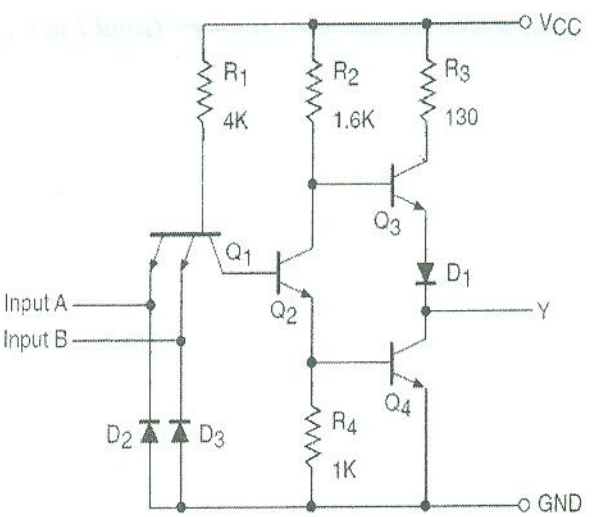
For the standard TTL gate shown (V_{CC} = 5 V):

a) When at least one of the inputs is low (0.2 V), what is the output high voltage and what is current would flow out of the input? (5 Marks)

b) What is the effect of removing the diodes: D_3, D_2 and D_1. (3 Marks)

c) What is the problem results when connecting the outputs of two gates of this type together? How can we modify this circuit to solve this problem? (4 Marks)

d) How can we modify this circuit to obtain:
- Low power TTL gate. (2 Marks)
- Schottky TTL gate (4 Marks)



Question.4 (14 Marks)

a) Design a 4-bit asynchronous up/down counter. Also draw the timing diagram of the counter in both cases. Assuming that the flip-flops used trigger on the –ve edge of the pulse applied to the clock terminal. (6 Marks)

b) Design a decade ripple counter. Draw the timing diagram and discuss the problem of this type of counters. (8 Marks)

3- a- For an empty cylindrical wave guide operating in the TM_{01} mode, **write down** expressions for the different field components and wave guide parameters.

b- If the **Longitudinal** electric field component (E_Z) in a cylindrical wave guide with **radius 5 cm** and walls are made of cupper with $\sigma_w = 10^8\ \Omega^{-1}/m$ and is filled with a lossy- dielectric material having $\varepsilon_r = 9 and \sigma_d = 10^{-4} \upsilon/m$ is given by:

$$Ez(r,\theta,z,t) = 10^{-4} e^{-\alpha z} J_0(48.1r)\cos(18\pi x10^9 t - \beta z) \quad \text{V/m}$$

determine: i- The mode of operation ii- $f, f_c, \eta, \alpha_d, \alpha_w$ and α

iii- f at which α_w is minimum and evaluate α_{min} as well as the magnitude of E_y at $z = 2m$.

4- a- (1) For a cubic cavity resonator operating in the TE_{101} mode , **write down** expressions for the Different field components in the cavity as well as the resonance frequency and the quality factor.

(2) i-If the resonance frequency and the quality factor of an **air filled** cubic cavity resonator operating in the dominant mode is 6 GHz and 2000 respectively. **Evaluate its dimensions and its walls directivity** σ_w .

ii-When the above cavity was re-filled with a **lossy dielectric material**, the new values of the resonance frequency and the quality factor became 1.5 GHz and 600 respectively, **evaluate the material parameters** (ε_r and σ_d).

b-For **an air filled circular cavity** resonator with **radius 6 cm**, and **operating in the TE_{011}** mode :

(1) **Write down** an expression for the resonance frequency.

(2) i- If the **quality factor** and the **resonance frequency** of the above cavity is **3000** and **3 GHz** respectively, **calculate the length d of the cavity**.

ii-If the above cavity **is filled with a lossless dielectric material with** $\varepsilon_r = 25$ calculate the new values of the resonance frequency and quality factor.

5- For the optical fiber :

a- i- Draw the simplified block diagram of the optical fiber transmission system.

ii- Draw the single fiber structure indicating the characters and functions of each element.

iii- Write down what do you know about the basic optical lows and definitions.

iv- Compare using neat figures the difference between step index and graded index optical fiber

b- If the light is traveling in **glass with refractive index of 1.6** towards a **glass-to-air interface** with **an incident angle of 30^0**, evaluate the reflection and refraction angles as well as the required incident angle to ensure total reflection.

c- If the optical fiber indexes is described by: $n(x) = 1.456\,\Pi\frac{x}{125x!0^{-6}} + 0.004\,\Pi\frac{x}{8.5x10^{-6}}$

i- Obtain the index of both the core and the cladding.

ii- Show the type of the fiber index then estimate its mode.

iii- Evaluate the required incident angle to ensure total reflection

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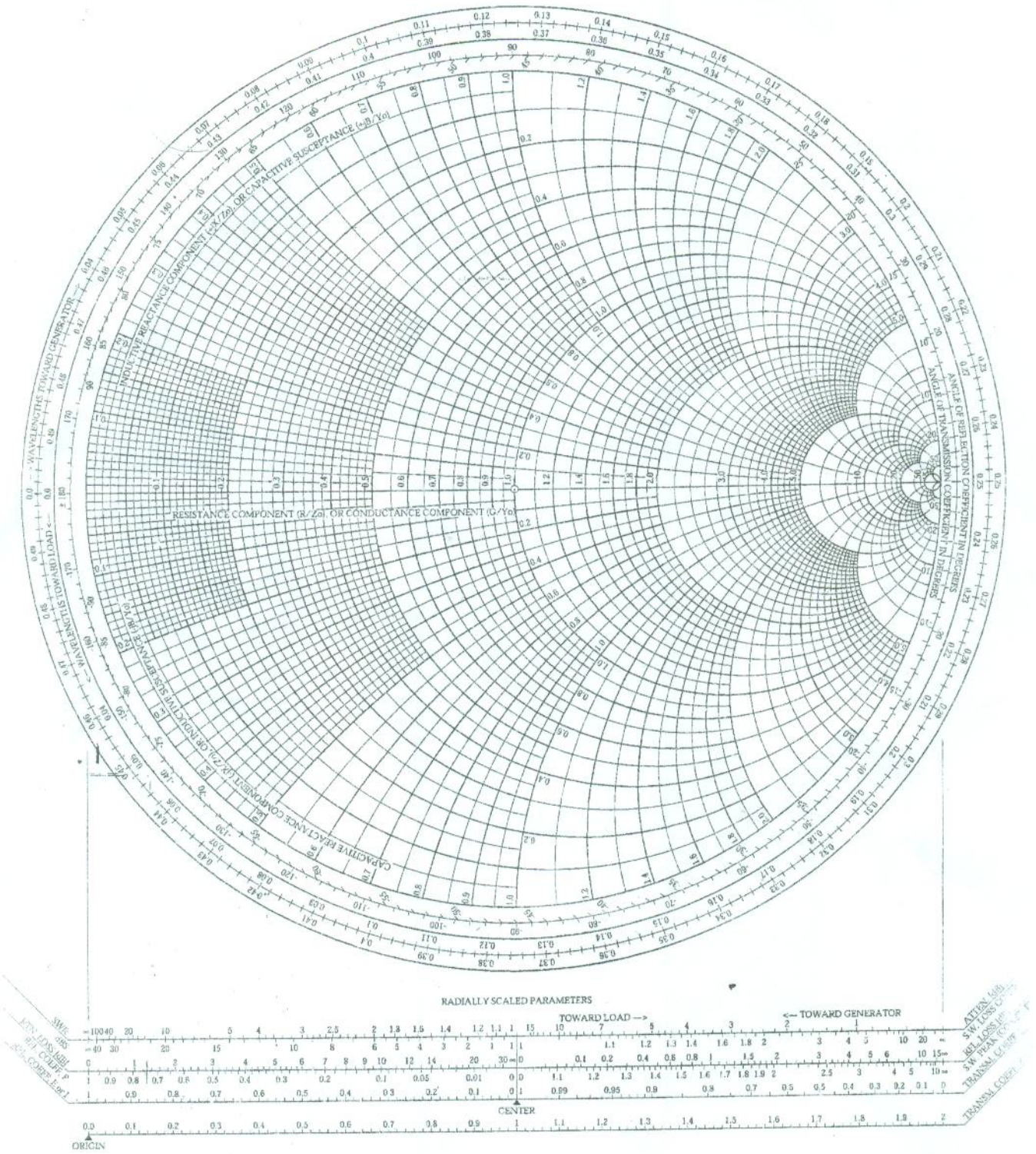
"رب اشرح لي صدري ويسر لي أمري"

Dr. Abdel-Fattah A. Abu-Hashem

The Complete Smith Chart

Black Magic Design



Tanta University

Department : Electronics & Communications

Faculty of Engineering

Course Title : Wave Propagation and Antennas 1 Course Code : EEC3110 Year : 3rd
Date :22th January 2012 (Academic Year 2011/2012 First Term) Allowed time: 3 hrs No: of pages : (2)

Attempt all questions:

1- **a- For the lossless RF T. L:**

i- Write down the general expressions for both voltage and current distributions $V(x)$, $I(x)$ as well as $V(L)$, $I(L)$

ii- **Derive** expressions for α , β, V_{ph} , *and* Z_0

iii-**Write down** an expression for the reflection coefficient at the load, ρ_l and then show its relation with the standing wave ratio, σ .

iv-**Write down** an expression for the input impedance of the line, $Z_{i/p}$, then **derive** expressions for the input impedance in the cases of short circuit line, Z_{SC} and open circuit line Z_{OC} , and sketch them showing the main applications of these lines.

v- Show how to achieve impedance matching using the quarter-wave length transformer.

b- i-For a radio frequency lossless T.L with length 6 m operating at 300 MHz with parameters $L = 10\,mh/m$, $C = 4\,\mu F/m$ and the reflection coefficient at load $\rho_L = 0.4\sqrt{3} + j0.4$ obtain the values of :

$Z_0, Z_L, \sigma, Z_{max}, Z_{min}, d_{1\,max}, d_{1\,min}, Z_{i/p}$ *and* Z *at* $2.5\,m$ *from load and at* $0.5\,m$ *from source* .

c- When designing the single stub matching for a lossless T.L having $Z_0 = 100\Omega$, and length $L = 4.2m$ operating at 300 MHz , the stub was to be of Length $l_s = 0.15m$ and at $d = 0.3m$ from load. Use the smith chart to obtain its load impedance Z_L then to obtain the following:

$\sigma, d_{1\,max}, d_{1\,min}, \rho$ *at* $1.2\,m$ *from generator*, $Z_{i/p}$ *and* Z *at* $1.3\,m$ *from load and at* $0.6\,m$ *from source* .

2- a- (1) Write down expressions for the different field components in a rectangular wave guide operating in the dominant mode. Then, derive an expression for the transmitted power W_T

(2) If the **transverse magnetic field** component (H_x) in a rectangular wave guide of dimensions (5 cm x 4 cm), filled with a **dielectric material** with $\varepsilon_r = 16$ is given by:

$$H_x(x,y,z,t) = 10^{-4}\sin(20\pi x)\cos(24\pi x 10^9 t - \beta_g z) \quad \text{A/m}$$

(a) **determine** : i- The mode of operation ii- $\alpha_d, \alpha_W, f_c, \beta_g, V_g$ *and* η_g

(b) Write expressions for the other field components.

(c) Show graphically how to adjust the feeding configuration of the operating mode.

(3) Check if other modes can propagate inside that W.G or not, if, what are them.

b- If the **longitudinal electric field component (E_Z)** in **an empty** rectangular wave guide 0perating in the dominant mode is given by:

$$E_Z(x,y,z,t) = 10^{-4}\sin(20\pi x)\sin(25\pi y)\cos(\omega t - \beta_g z) \quad \text{V/m}$$

(a) **determine** : i- The W.G dimensions and its f_c then, sketch α_W versus frequency . ii- f at which α_W is minimum , β_g, V_g *and* η_g at this frequency.

(b) Write expressions for the other field components

P.T.O

Question 3 — 20 Marks

a- The following data were collected to determine the relationship between pressure and the corresponding scale reading for the purpose of calibration.

Pressure (X) (lb/sq.in.)	10	10	10	10	10	50	50	50	50	50
Scale reading (Y)	13	18	16	15	20	86	90	88	88	92

i) Compute the rank correlation coefficient.

ii) Find the equation of the regression line.

iii) The purpose of calibration in this application is to estimate pressure from an observed scale reading. Estimate the pressure for scale reading of 54.

b- If we have a finite population of five observations 3, 5, 7, 9, 11; find the sampling distribution of the mean if we draw a random sample of size 3 and sampling is without replacement.

c- An efficiency expert whishes to determine the average time that it takes to drill three holes in a certain metal plate, how large a sample will he need to be *95%* confident that his sample mean will differ by *15* seconds from the true mean? Assume that it is known from previous studies that the population standard deviation is 40 seconds.

Question 4 — 23 Marks

a- To compare the prices of a certain product in two cities, ten shops were selected at random in each city. The prices were noted below:

City I :	61	63	56	63	56	63	59	56	44	61
City II :	55	54	47	59	51	61	57	54	64	58

At 0.05 level of significance test whether the mean of prices in the two cities is said to be the same or not?

b- Patients arrive at the government hospital for emergency service at the rate of one every hour. Currently, only one emergency case can be handled at a time. Patients spend on average of 20 minutes receiving emergency care, find:

1- The probability that a patient arriving at the hospital need not to wait to get the emergency care
2- The average length of the queue that forms.
3- The average time a patient spends in the hospital.
4- The average time a patient spends before receiving emergency care.
5- The probability that a patient arriving at the hospital will have to wait.
6- The probability that there will be five or more patients in the hospital.
7- The amount of average service time needs to be decreased to keep the average time in the hospital less than 25 minutes.

c- If X is uniformly distributed with mean 1 and variance $4/3$, find $P(x< 0)$?

A part of the standard normal table:

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817

A part of the t- table:

	α								
v	**0.40**	**0.30**	**0.20**	**0.15**	**0.10**	**0.05**	**0.025**	**0.02**	**0.015**
16	0.258	0.535	0.865	1.071	1.337	1.746	2.120	2.235	2.382
17	0.257	0.534	0.863	1.069	1.333	1.740	2.110	2.224	2.368
18	0.257	0.534	0.862	1.067	1.330	1.734	2.101	2.214	2.356
19	0.257	0.533	0.861	1.066	1.328	1.729	2.093	2.205	2.346
20	0.257	0.533	0.860	1.064	1.325	1.725	2.086	2.197	2.336

Tanta University	Physics & Mathematics Dept. Total Mark : 85	Faculty of Engineering

Course Title: Engineering Mathematics (4) *Course Code: PME3115* *Year: Third Year Communications*

Date: 18/1/2012 (Final First Term Exam) *Allowed time: 3 Hours* *No. of Pages: (2)*

Answer all the following questions:

Question 1 — 12 Marks

a- Three machines A, B and C produce respectively 50%, 30% and 20% of the total number of items. The defective output of these machines is 4%, 5% and 3% respectively. An item is chosen at random:
i) What is the probability that the chosen item is non-defective?
ii) If the chosen item was non-defective, what is the probability that it come from machine A or C?

b- A die is loaded in such a manner that for $n = 1,2, 3, 4, 5, 6$, the probability of the face marked n, landing on top when the die is rolled is proportional to n. Find the probability that an odd number will appear on tossing the die.

c- A random variable X may assume 4 values with probabilities $\frac{1+3x}{4}$, $\frac{1-x}{4}$, $\frac{1-2x}{4}$ and $\frac{1-4x}{4}$, find the condition on X so that these values represent the probability function of X.

Question 2 — 30 Marks

a- Say (true) or (false) and correct the false one:

1- In general $E\left(\frac{1}{X}\right) = \frac{1}{E(X)}$
2- The units of mean and variance of a random variable are the same as that of the random variable itself.
3- The coefficient of variation is unit-less.
4- A necessary condition for a queuing system to be stable is that the arrival rate must be greater than the service rate.
5- A continuous random variable X has a *p.d.f.* $f(x) = ax+b$, $0 \le x \le 1$, the relation between a and b is $a+2b=2$.
6- Different probability density functions may have the same mean and the same variance.
7- The median is used as a measure of central tendency for the descriptive data.
8- The mode is most central tendency measure affected by the extreme values of the data.
9- In sampling the size of the sample (n) does not depend on the variance of the population.
10- Samples are used only to study infinite populations.
11- If the variance of a random variable approaches zero, then the probability that the random variable will be equal to its mean value approaches 1/2.
12- A symmetric distribution has zero coefficient of skewness.

b- The probability of a student passing an exam is 0.8, what is the probability that he will finally pass the exam before the fourth attempt?

c- If a probability density function is given by $f(x) = \begin{cases} kxe^{-\lambda x} & ,x \ge 0,\ \lambda > 0 \\ o & \text{otherwise} \end{cases}$

Determine:
1) the value of k 2) the cumulative distribution function 3) μ, σ^2, σ and $M_x(t)$

Question 4

a) In the XOR problem, there are four patterns: (0,0), (0,1), (1,0), and (1,1) in a two-dimensional input space. It is required to construct a pattern classifier using the **RBF** network that produces the binary output 0 in response to the input pattern (1,1) or (0,0), and the binary output 1 in response to the input pattern (0,1) or (1.0). Use the following Gaussian hidden functions

$\varphi_1(X) = \exp(-||X - t_1||^2)$, $t_1 = [1, 1]^T$

$\varphi_2(X) = \exp(-||X - t_2||^2)$, $t_2 = [0, 0]^T$

b) There are many applications of ANNs. List at least five of these applications? and then briefly describe the equalization of multipath distorted 64-QAM using the neural network

Question 5

Given the neural network with initialized weights as in Figure 1. It is required to train the network using the backpropagation learning algorithm with a learning rate of 0.1. All hidden and output neurons in the network employ sigmoid activation function. Find the updated weights, for the following training pattern $X = [0.6, 0.1]^T$ and $O = [1, 0]^T$.

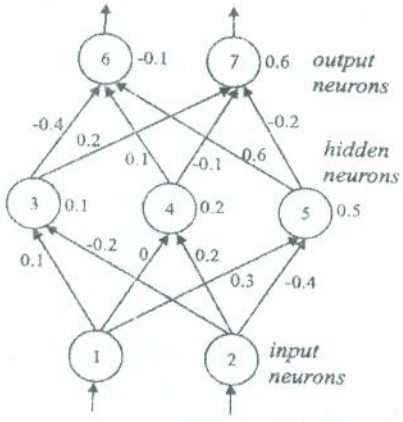


Figure 1

With my best wishes, Dr. Ing. Alsayed Algergawy

Tanta University
Faculty of Engineering
Computers & Control Eng. Dept.
3rd Year Comm. Student

Neural Networks
First Term Exam
January 11, 2012
Time Allowed: 3 Hours

Answer the following questions.

Question 1

Tell whether each of the following statements is true or false, and then correct the false ones:

a) A single perceptron can compute the XOR function.

b) In backpropagation learning, we should start with a small learning parameter η and slowly increase it during the learning process.

c) A three-layer BPN with 5 neurons in each layer has a total of 50 connections and 50 weights.

d) Typically, Adalines produce better results for new (untrained) inputs than do perceptrons.

e) After training a Self-Organizing Map, output neurons that win for similar inputs are usually far apart from each other in the map.

f) The radial-basis function (RBF) networks contain one or more hidden layers.

Question 2

a) Explain how an Adaline works, i.e., describe the function that it computes and its learning algorithm? What is the main difference between it and the perceprton?

b) Briefly State the convergence of the LMS algorithm?

c) A neuron K receives two inputs x_1 and x_2 with synaptic weights w_{k1} and w_{k2}, respectively. The bias weight is w_{k0}. Given that $x_1 = 0.5$, $x_2 = 1$, $w_{k1} = 0.8$, $w_{k2} = -0.7$, and $w_{k0} = 0.7$, find the output value for the following cases:

i- if the neuron has a sigmoid function.
ii- if the neuron is linear.

Question 3

a) In a 2-D self-organising map (SOM) with input vectors of dimension m, and k neurons in the map, how many weights will there be?

b) Once the SOM network has been properly initialized, there are three essential processes involved in the formation of the network. List the three processes? and then describe **ONLY** one process?

c) What are the careful considerations that must be given to the choice of the learning-rate parameter and neighborhood function during the self-organizing phase of the SOM?