جامعة طنطا
كلية الهندسة
قسم الالكترونات والاتصالات الكهربية

المادة/ إدارة المشروعات
(EPM32H4)
الفرقة الرابعة

بسم الله الرحمن الرحيم
التاريخ : 2012/1/26
الزمن : ساعتان

أجب عن الأسئلة الآتية:- (40 درجة)

السؤال الأول:-

1-ما هي العلاقة بين دراسة الجدوى والتخطيط الاستراتيجى.

2-اكتب نبذة مختصرة عن الجدوى الفنية للمشروع.

3-تكلم بالتفصيل عن عناصر التصنيع.

السؤال الثانى: -

1- يمكن تقسيم المصنع على حسب طرق عمليات الإنتاج والتخطيط إلى ثلاثة أقسام رئيسية اكتب نبذة مختصرة عن هذه الأقسام

2- تكلم عن أهم:-

(ا)- العوامل المؤثرة في حجم مرونة الطلب.

(ب)- العوامل التي يترتب عليها نقصان أو زيادة العرض.

3- ما هي فوائد إجراء التقييم البيني؟- وما هي خطوات معالجة الآثار البيئية للمشروع.

السؤال الثالث:-

1- ما المخزون؟ - لماذا نحتفظ بالمخزون.

2- لماذا نقوم باعداد دراسات الجدوى الاقتصادية؟ مع شرح تفصيلي لأنواع دراسات الجدوى الاقتصادية.

3- ما أهمية المفاضلة بين المشروعات مع شرح لمراحل المفاضلة بين المشروعات.

4- اذكر أهم نقاط الاختلاف بين معايير الربحية التجارية ومعايير الربحية القومية.

السؤال الرابع:-

• اكتب نبذة مختصرة عن التقرير الخاص بك.

مع أطيب التمنيات بالنجاح
ا0د/ عبد الفتاح مصطفى خورشد

4- The shown arrangement represents a **broadside array planar array** that consists of 6x4 uniformly illuminated circular apertures **each with radius** 1.25λ and the E- field is in Y- direction:

   i- Estimate the gain and the 3-dB beam width of each element.

   ii- Find and sketch the total field pattern in both E and H planes.
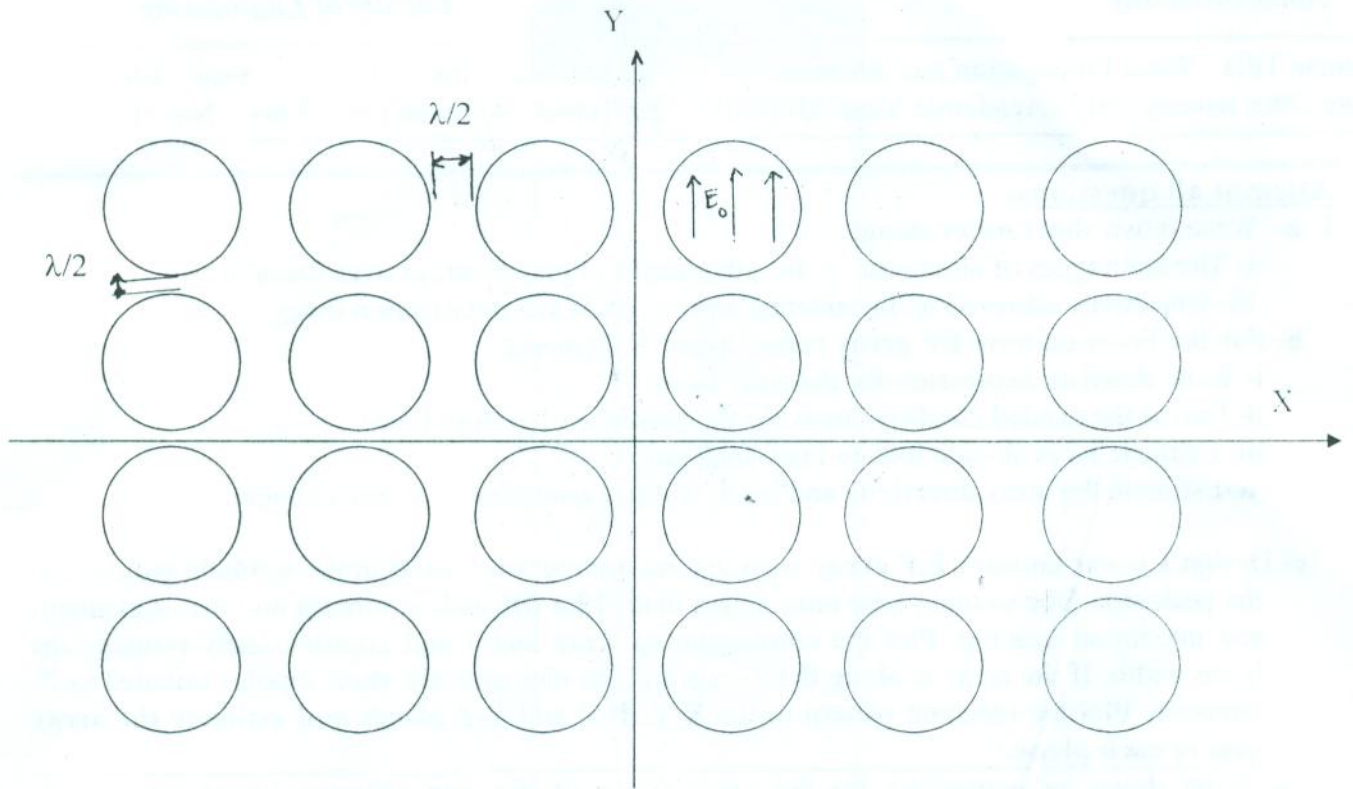
5-a- A $(4\lambda \times 3\lambda)$ rectangular apertures **fed with the dominant mode** :

   i- Find and sketch the field pattern of the aperture in both E and H planes

   ii- Evaluate its Δ_{N-N} , Δ_{3dB} and D

b- (1) Discuss the main applications of the parabolic reflector antenna **.then write down** the relation between the $\dfrac{F}{d}$ ratio and the reflector subtended angle θ_0 .

   (2) For the special case of feeding pattern on the form $G_f(\theta) = k\cos^2(\theta)$ .derive an expression for the illumination efficiency η_{ill} and sketch it versus the reflector subtended angle θ_0

   (3) Design the previous parabolic reflector antenna when having maximum directivity of 30 dBs at 6 GHz

c- For the micro strip antenna:

   i- Describe the structure, properties and applications.

   ii- Write down a general expression for the far field pattern. gain and radiation conductance assuming thin substrate, *ground plate is placed in x-z plane.*

   iii- Evaluate the above parameters for a strip width of $w/\lambda = 0.1$ and $w/\lambda = 10$.

d- Determine and sketch the pattern of a vertically polarized radar antenna placed at a height of $1.5\ \lambda$ above ground considering the antenna to have a **side lobe free pencil beam pattern** of 2^0 beam width and directed to 60^0 w.r.t ground.

Department : Electronics& Communications

Tanta University

Faculty of Engineering

Course Title : Wave Propagation and Antennas 2   Course Code : EEC412   Year : 4th
Date :20th January 2012 (Academic Year 2011/2012 First Term)   Allowed time: 3 hrs   No: of pages :(2)

Attempt all questions:

1- a- Write down **short notes** about:
   i- The main types of antennas.   ii- Advantages of planar arrays over linear arrays.
   iii- Objectives achieved by the antenna arrays. iv- Wave polarization types

b- For the linear uniform **EF array** consisting of N elements :
   i- Write down an expression for the array factor.
   ii- Derive the needed condition to avoid the presence of grating lobes.
   iii- Evaluate its peak-side lobe to main lobe ratio.
   iv-Estimate the array directivity and beam width considering isotropic elements .

c- Design a linear uniform **E.F array** such that no grating lobes exist in the resultant pattern and the peak-side lobe to main lobe ratio is less than **-12.4 dB** with minimum number of elements and maximum spacing. Plot the corresponding array factor and approximately estimate the beam width. If the array is along the Z-axis and the elements are short dipoles oriented to Z-direction. Plot the resultant pattern in the X-Y, X-Z and Y-Z planes **and estimate the array gain in each plane.**

2- 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 X-axis that oriented towards the Z-direction 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-Z planes.

c- For a 5 elements **Tcheby-Chave End fire array** consisting of short dipoles placed on Y-axis that oriented towards the Z-direction and separated by $\lambda/2$ spacing, plot the total field pattern in the Z-X and Y-X planes and evaluate the elements relative feeding coefficients to obtain the required pattern.

3- a-- For a **8x6 elements** (short dipoles oriented to Y-direction) **planar array** placed in the x-y plane with $d_x = d_y = \lambda/2$ and having the main lobe oriented towards $(\theta_o = 30^0 \ and \ \phi_0 = 90^0)$ Plot the array factor as well as the total field pattern in the Z-X, Z-Y and Y-X planes, then estimate the array gain in the X-Y plane.

b- (1) Write down an expression for the array factor of a circular array placed in the X-Y plane, then, Estimate the **6 elements** phases(α_n) required to orient the main lobe towards $(\theta_o = 30^0 \ and \ \phi_0 = 60^0)$ if the radius of the array is 2λ .

(2) Sketch the principal pattern for a uniform feeding **8 elements** broadside circular array with a radius of 4λ in the X-Y plane where the elements are short dipoles oriented towards Y-axis.

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iv. The probability that there are more than 5 users in the system.
v. The average number of waiting packets.
vi. The probability that there are less than 6 packets in the network

Question (4)

(a) What are the main constraints to be considered when you are going to develop a numbering plan?

(b) Consider a user in UK has phoned his friend. He dialed the following number "003321327579"

i. Is this a national or international call?
ii. Does this number satisfy the CCITT recommendations? Discuss some of these with application on the dialed number
iii. Classify the number to its basic elements

(c) Consider a numbering area of population of 1000 users. The capacity of each of the available exchange is 100 users.

i. Suggest a numbering plan.
ii. For a customer in this area to phone his friend, how many digits he has to dial if there are 20 numbering areas in the country.
iii. Repeat (ii) for user's friend in another area.

Best Wishes of Success

Tanta University	Department: Electronics and Electrical Communication Eng. Total Marks: 90 Marks	Faculty of Engineering

Course Title: Telecommunication Networks Date: 12/1/ 2012 (First term)	Course Code: EEC 4124 Allowed time: 3 hrs	Year: 4th No. of Pages: (2)

Remarks: (Answer all questions as possible clearly, shortly and briefly … assume any missing data… answers should be supported by sketches)

Answer all questions as possible clearly, shortly and briefly

Question (1)

(a) What are the functions of signaling system?

(b) Compare between In-Channel and Common Channel Signaling.

(c) Discuss the effect of different transmission paths on the wave propagation.

(d) There are many problems encountered with signal transmission through transmission media; such as delay distortion, echo, and crosstalk. State, briefly in points, their sources, effects and methods to overcome each one (Hint: Put your answer in a table, and support your answer with sketches).

Question (2)

(a) Compare between circuit switching and packet switching schemes in terms of advantages and disadvantages.

(b) Explain the relationship between packet size and transmission time.

(c) It is required to transfer a message with size of 80 Kbytes over a communication network with 3 nodes, from the user to the server. The data rate for all links is 2 Mbps. The packet size is 1000 bits and 100 bits as a header. The set-up time is 0.12 sec, with processing time of 0.08 sec at each node, while the average queuing delay at each node is 0.2 sec. The propagation speed over a link is $300 m/\mu sec$, where the hop distance is 60 km. Calculate the end-to end delay time for the following:

    i- Circuit switching network

    ii- Datagram packet switching network

    iii- Virtual circuit packet switching network with acknowledgment, $P_{min} = 70 bits$.

Question (3)

(a) Define the following terms: arrival call rate, departure rate, busy hour, inter-arrival time, GoS, time congestion, quasi-random system and call Congestion.

(b) Deduce an expression for the average queue length in a delay system.

(c) Apply the following sentence for loss system "Time congestion doesn't necessitate call congestion".

(d) Consider a single channel packet network works as a delay system. In a busy hour, 1800 packets are offered, each of 1.2 sec duration. Calculate

    i. The probability that a packet is delayed.

    ii. The average number of packets in the network.

    iii. The average time spent in the network.

d) What is a digital certificate? Who can issue it? How can it solve the "man-in-middle" attack on Diffie-Hellman key exchange protocol? (4 Marks)

Question.4 (18 Marks)

a) Why does IPSec tunnel mode fail to hide the header information when used from host to host? Is this also the case when tunnel mode is used from gateway to gateway? Explain you answer with figures. (5 Marks)

b) What is the security parameter index? Is it encrypted in the ESP or not and why? (3 Marks)

c) What services are provided by the SSL: Handshake Protocol –Record Protocol? What is the difference between SSL connection and session? (5 Marks)

d) Show how PGP uses public-key encryption and symmetric-key encryption for achieving its services? How does it use the concept of trust? (5 Marks)

Question.5 (13 Marks)

a) Who are hackers? What are their motivations? What are the main techniques used for intrusion detection and prevention? (3 Marks)

b) Suppose that Alice has accessed the four files F_0, F_1, F_2, and F_3 at initial rates $H_0 = 0.1$, $H_1 = 0.38$, $H_2 = 0.364$, and $H_3 = 0.156$. Now suppose that over some recent time interval, Alice has accessed these files at rates: $A_0 = 0.05$, $A_1 = 0.25$, $A_2 = 0.25$, and $A_3 = 0.45$. According to anomaly-based IDS, is this normal behavior for Alice? Give the updated values for H_0, H_1, H_2, and H_3. (4 Marks)

c) What is a virus? What are its phases? How can we countermeasure it? How does a worm differ from it? (3 Marks)

d) What is a firewall? What are its two types? What is the main difference between them? (3 Marks)

===================== *Good Luck , Dr. Roayat Ismail* =====================

Elective Course (3): Information Security	Course Code: EEC4126	Year: 4th
Date: Jan., 16th 2012 (First Term)	Allowed Time: 3hrs	No. of Pages: (2)

Answer the following Questions:

Question.1 (18 Marks).

a) Define: confidentiality, integrity, and availability. Give an example where each is required. (Tabulate your answer). (4 Marks)

b) Find the plaintext and the key from the ciphertext: "CSYEVIXIVQMREXIH", given that the cipher is a simple substitution of the shift-by-n variety. (5 Marks)

c) If W and B are the two most common letters in a long ciphertext, respectively, encrypted by an affine transformation: $C \equiv (a \cdot P + b) \mod 26$. What are the most likely values for a and b? What is the type of this cipher and what is its problem? How can we solve it? (5 Marks)

d) Encrypt the message: "we are all together" using a double transposition cipher with 4 rows and 4 columns, using the row permutation

$$(1, 2, 3, 4) \rightarrow (2, 4, 1, 3)$$

and the column permutation

$$(1, 2, 3, 4) \rightarrow (3, 1, 2, 4)$$ (4 Marks)

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Question.2 (18 Marks)

a) Suppose that the keys used with DES consist only of the letters from A to Z and are 8 letters long. Give an approximation of the length of time it would take for the brute-force attack. Assume that each key can be tested in one μsec. Do the same for keys 8 letters or digits long. Is DES is secure against this attack? How can it be modified against this attack? (5 Marks)

b) Suppose that we use a block cipher to encrypt according to the rule

$$C_0 = IV \oplus E(P_0, K), \quad C_1 = C_0 \oplus E(P_1, K), \quad C_2 = C_1 \oplus E(P_2, K), \ldots$$

What is the corresponding decryption rule? What is the disadvantage of this mode compared with CBC mode? (4 Marks)

c) What is the hard problem of El-Gamal's cryptosystem? What is its advantage and disadvantage compared to RSA cryptosystem? For a prime $p = 2357$ and generator $\alpha = 2$, encrypt the message $m = 2035$ and recover it with decryption. (5 Marks)

d) A hybrid cryptosystem uses both public key and symmetric key cryptography in order to obtain the benefits of each. Illustrate such a system using RSA as the public key system and AES as the symmetric cipher. (4 Marks)

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Question.3 (18 Marks)

a) What characteristics are needed in secure hash function? Explain which of these characteristics is necessary for security against: external attacker - sender forgeability - password protection. (4 Marks)

b) What is the message authentication code? Can it replace digital signature? How can we obtain it from: symmetric key cryptosystem-keyed hash function-unkeyed hash function? (5 Marks)

c) What problem was Kerberos designed to address? How many servers it has and what is the role of each? What is a realm? (5 Marks)

i- Data that can be transmitted as telemetry signal include

1-................ 2-................ 3-................ 4-................

Question (3): (18 Marks)

1- Consider a satellite that travels in a circular orbit for which the period is 1 day. Calculate the following: (6 Marks)

a- The radius for the orbit.

b- The orbital velocity in km/h.

c- The satellite altitude in km.

2- It is required to design a LEO satellite system with a minimum elevation angle of 5o and an earth central angle of 40o. Let RE=6370 Km. Determine: (6 Marks)

a- The orbital altitude. Comment on your results!

b- The required number of orbital planes.

c- The required number of satellites per orbit.

3- The range between a ground station and a satellite is 42000 Km. the receiving antenna has a gain of 50 dB. Calculate the following:(6 Marks)

a-The free space loss at a frequency of 6 GHz

b- The received power if the transmitted power is 6 W and the transmitting antenna gain is 48.2 dB

Question (4): (25 Marks)

a- Draw the general block diagram of the satellite transponder at c band. (10 Marks)

b- Draw the satellite wideband receiver. (5 Marks)

c- Draw the satellite receive-only TV system operating in Ku band with its indoor and outdoor units and indicate the frequency range along the connection. (10 Marks)

Question (5): (40 Marks)

a- Derive the mathematical expression of the link power budget equation. (6 Marks)

b- State the different types of satellite handover and state the main causes of each type (6 Marks)

c- State the different types of satellite orbits according to (8 Marks)

- Inclination angle   - altitude

d- Write short notes about: (20 Marks)

- Launching the satellite to the GEO orbit

- Attitude control

- Station keeping

- Thermal control

With Best Wishes

Dr. Salah Khamis

Answer the following questions:

Question (1):   **(12 Marks)**

Choose the correct answer(write the answer only)   **(2 Marks for each point)**

1- A wire antenna is used at UHF & VHF on board the satellite for

a- TT&C system   b – forming a widebeam for global coverage

2- The direct broadcasting satellite uses

a- VSSB modulation   b-FM modulation

3- With 3 axes stabilized satellites, the satellite own structure

a- rotates   b-does not rotate

4-Bent pipe LEO satellite system means

a- complete the connection via terrestrial network b-use many satellites to reach the destination

5-The wideband receiver in the satellite transponder will

a-amplify the uplink signal   b- frequency convert the signal to downlink band c-both a&b

6-The coaxial cable in the TVRO system will

a- carry dc to outdoor unit   b- feed signal to indoor unit c- both a&b

Question (2):   **(30 Marks)**

Complete the following sentences (write the answer only):   **(1 Mark for each point)**

a- The satellite has a dual role:

1-...........................   2-...........................

b- For a satellite link, the performance is impaired in transmission capability by:

1-...........................   2-...........................   3-...........................

c- The atmospheric loss depends on:

1-...............   2-...............   3-...............   4-...............

d- The time to complete one orbit depends on:

1-...........................   2-...........................   3-...........................

e-the choice of an orbit is of a fundamental importance as it determines:

1-...............   2-...............   3-...............   4-...............

f- Satellite electric power supply subsystem consists of

1-...........................   2-...........................   3-...........................

g- The amount of power available from a photo voltaic device is determined by:

1-...............   2-...............   3-...............   4-...............

h- Solar cell, the magnitude of degradation depends on:

1-...........................   2-...........................   3-...........................