Q5/A/ What is DC chopper? List a few industrial applications of DC chopper.(5 marks)

B/ A Single–Phase Bridge Inverter R=2.4Ω and dc input Vs is = 48V .Determine the :

a) rms output voltage at the fundamental frequency,V1.

b) output power Po.

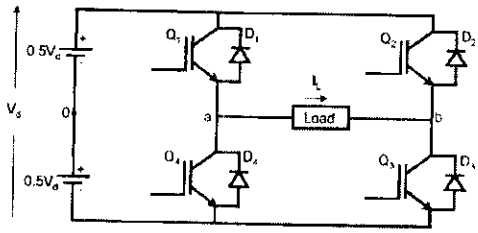
c) average and peak currents of each transistor.

d) peak reverse blocking voltage of each transistor, VB.

e) total harmonic distortion THD.

f) distortion factor DF.

e) harmonic factor and distortion factor of lowest-order harmonic. (20 marks)



Good Luck

بسم الله الرحمن الرحيم

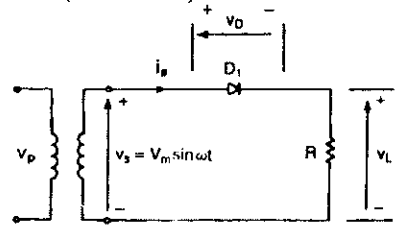
University of Diyala	**Final Exam.2**	**Subject: Power Electronics**
College of Engineering	**2011 – 2012**	**Time:3 hours**
Department of Electrical power	**3rd,4 th stages**	**Date: sept. , , 2012**
Department of Electronic		

Answer only four Questions

Q1 /A / Draw the circuit and wave forms for full-wave rectifier of center tapped transformer with resistive load.(5 marks)

B/

The rectifier shown in figure has a purely resistive load of *R*.
Determine,
(a) the efficiency
(b) the form factor
(c) the ripple factor
(d) the transformer utilization factor
(e) the peak inverse voltage (*PIV*) of diode D_1
(f) the *CF* of the input current (20 marks)



(a) Circuit diagram

Q2/A/ Discuss protection of the thyristor during turn on and turn off. (10 marks)

B/ A Thyristor with a steady state power loss of 30W has a junction to heat sink thermal resistance of 0.7°c/w. Determine the maximum value of Thermal Resistance the heat sink can have if the ambient temperature is 40°C and junction temperature is limited to 125°C. (15marks)

Q3 /A/Discuss the switching time of the MOSFT (5 marks)

B/ A three phase star rectifier has purely resistive load R ohms. Determine: a)Effiency. b) Form factor. c) Ripple factor. d) TUF. e) PIV for each diode. f) I peak through the diode if I_{dc} =30 A at V_{dc} =140 V. (20 marks)

Q4/A/ Draw the three phase / single phase cycloconverter circuit. (5 marks)

B/ A pair of parallel thyristors connected in opposite to control a resistive load =7 Ω, t on=2.5 ms, Vs= 350 sin 315t. Calculate Vo rms, power dissipated in the load. (20 marks)

University of Diyala
College of Engineering
Electronics Department

Final - year Examination
Second attempt / 2011-2012

Class: 4th
Subject:Communication
Time: 3 Hours
Date: Sep. 2012

Note: Answer only five questions.

Q1: For a LBC has generator matrix [G] :

1- Use hamming bound to find error correction capability.
2- Find the parity check matrix.
3- Find the code table.
4-If the received word is [R]=[1011110011], find the corrected word at the receiver.

$$[G] = \begin{pmatrix} 1 & 0 & 0 & 1 & 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1 & 1 & 1 & 0 & 1 \end{pmatrix}$$

Q2: a ternary source has $P(x_1) = P(x_2) = 0.25$, produces symbols transmitted through a channel having :

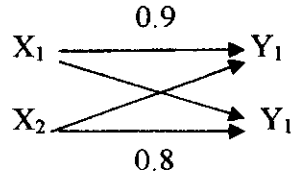
$$P(y_j/x_i) = \begin{cases} 0.9 & \text{if } i=j \quad i=0,1,2 \\ P & \text{if } i\neq j \quad j=0,1,2 \end{cases}$$

Find the source entropy, the transinformation and conditional entropies.

Q3: Develop ternary Huffman code for the following set of messages, then find coding efficiency .

	x_1	x_2	x_3	x_4	x_5	x_6
p(x) = [	0.4	0.25	0.15	0.1	0.07	0.03]

Q4: Find the channel capacity for the channel shown below .



Q5 : A systematic cyclic code with generator polynomial $p(x) = x^4+x^3+1$ is used to protect data grouped in blocks of 6 bits :

1- Using the encoder logic circuit, find the transmitted word for data word D=[100011].
2- Find the syndrome for double errors in the first and last positions.

Q6: Nongaussian noise with PDF given by $p(n) = K(4-n^2)$, $|n| < 2$, affects the bipolar ±15 Volts signal. Find the constant K and the optimum threshold decision level if $p(0_T) = 2/3$.

Note : 12 Marks for each question

Good luck

Examiner : Mr. Dheyaa Tareq

University of Diyala
College of Engineering
Dep. Of Communication.
Final Exam/2st Attempt

Class: fourth stage
Subject: Microwave
Year: 2012-2013
Time:3 hour

Note:-Answer four question only

Q1	A) If the separation between two adjant nulls is 3.5 cm and between twice minimum power points is 2.5 mm. Determine the value of VSWR. B) Show that E and H are mutually perpendicular in any TE or TM wave (as with ordinary plane waves).	15 mark
Q2	A) The location of successive minimum slotted line section is found 4.4 cm and 7.36 cm. What is incident frequency for TE_{10} mode if cut – off wavelength is 7 cm . B) Write down the Maxwell's equation in integral form.	15 mark
Q3	A TE_{11} mode is propagating through a circular waveguide, the radius of the guide is 5 cm and guide contain an air dielectric. Determine its cut – off frequency, guide wavelength for an operating frequency of 3GHz, also find its wave impedance. ($\delta_{mn} = 1.841$).	15 mark
Q4	A) Calculate the resonant frequency of rectangular cavity resonator of dimension a = 2 cm, b = 1 cm, d = 3 cm for TE_{101} . B) Prove that: Normal component of the magnetic flux density is also continuous a cross the boundary .	15 mark
Q5	A 1 cm * 2 cm waveguide is filled with deionized water with $\epsilon_r = 81$. If the operating frequency $f_o = 4.5$ GHz Find: a) All possible propagating mode and their cut – off frequency. b) Intrinsic impedance of the highest mode. c) Group velocity of the lowest mode.	15 mark

Good Luck

Head of Dept.

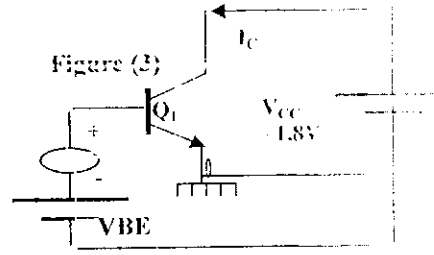
Name: Dr. Saib Thiab Alwan

Lecturer.

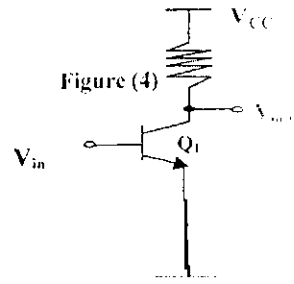
Name: Dr. Saib Thiab Alwan

Q4.

a-For the circuit shown in Figure (3) draw the equivalent small signal model of it, then find the value of g_m and r_π, if $I_s = 3 \times 10^{-16}$ A, ß=100, and prove each formula used .
Hinte:suppose the circuit done with new IC technology.
b-Repeat the solution of (a) for discrete device technology.
c-Give your comments for the obtained results in (a) & (b).



Q5. In the common emitter amplifier shown in the Figure(4) below, the voltage gain (A_V) equal 20.Assume the base is biased such that VBE = 0.8V.Calculate the allowable supply voltage (V_{CC}) if VCB=0 & Q_1 must remain in the active mode, for :
VA= ∞.



Q6. Answer of the following.

A diode biased at currents of 1 m A .
i. Determine the current change if V_D changes by 1 mV.
ii. Determine the voltage change if I_D changes by 10%.
Derive the formula used in solving i and ii.

Good luck

مدرس المادة

رئيس القسم

Dr. Eng. Khalid Awaad

University of Diyala
College of Engineering
Dept. Of Electronic Engineering

Final - Year Examination
Second attempt / 20011-2012

Class: 4th year
Subject: Microelectronic
Time: 3 hour

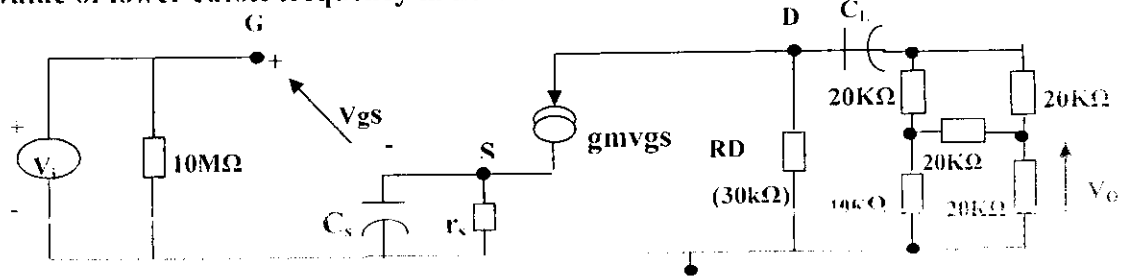
Date: 9 / 9 / 2012

Note:- Answer five questions including (Q_1&Q_4), 12 marks for each question .

Q_1. For the circuit shown in Figure (1), determine the following:

1- The voltage gain (v_o / v_i) :(i). When C_S & C_L are removed.(ii). When C_S is short & C_L is removed. (iii). When the transistor operated at mid band frequency.(iv). For the above three results, in which one the circuit can be consider as an amplifier, why.

2-Find the value of lower cutoff frequency in hertz's/sec.



gm= 5m mho, r_s = 100 ohm
Cs=100μ F,C_L= 5μ F

Figure (1)

Q_2. A cell phone incorporates a 2 GHz oscillator whose frequency is defined by the resonance frequency of an LC tank (Figure (2)). If the tank capacitance, Cj=0.265 fF/ A ($\mu m^{2)}$ at V_R=0. Calculate the change in oscillation frequency while reverse voltage goes from 0 to 3 volts. Assume the circuit operates at 2 GHz at a reverse voltage of 0 volts, & the junction area is 2000 μm^2.

Hint: Take built in voltage (V_0) equal to 0.73 volts, f=1*10^{-15}

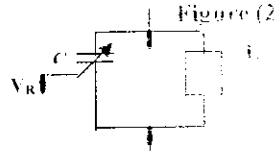


Figure (2)

Q3- Answer only one of the following.

a. For the following information's, if you are sure that the information's are correct write YES if its not write NO .If you are not sure leave it otherwise you are loss mark of a correct answer for each wrong answer.

1. Early effect cause undesirable results for BJT amplifier applications.
2. In deep saturation, the BJT can not be consider as vces.
3. Silicon & carbon can not be doped with other elements to change its electrical conducting properties.
4. It can not be harness V_o to use the pn junction as a battery.
5. When the BJT base area is increased by a factor n of the I_s decreased by the factor of 1/n.

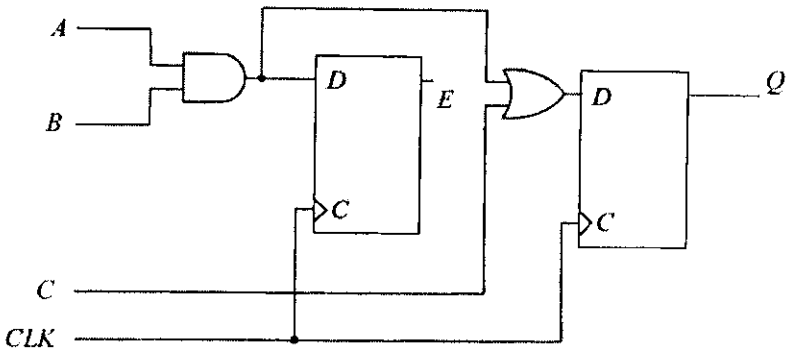
b. Consider a Si sample of length 10μm & cross-sectional area 1 μm^2 , uniformly doped with 10^{18} cm^{-3} arsenic(As) maintained at T = 300K. 1 Volt is applied across its length. Hint: Take n_i^2 =1x$10^{20}$$cm^{-6}$, μ_n =300 cm^2 / V.s .

(i).What are the density of each carriers in this sample?.(ii). Estimate the resistance of this sample.

Continued

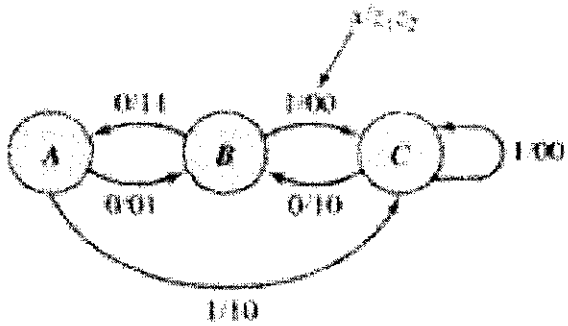
B I) Show the main functions of ***SPLDs*** and ***CPLDs***?

II) A sequential circuit with two *D* flip-flops, three inputs ***A,B*** and ***C,*** and two outputs ***E*** and ***Q,*** is specified by figure below, design it using first GAL**22V10** (show ***OLMC*** connection)and second PAL**16P8** and flip flops (show output logic connection)? (12 marks)



Q_4 / Convert the state graph, it has two inputs (X) and two outputs (z_1z_2), shown in figure below to ASM chart, then realize it by using **PLA** and **D**-Flip flop?

(12 marks)



Q_5 / Draw ASM chart for a clocked sequential network which investigates an input sequence X and which will produce an output of Z = 1 for ending of input sequence 010 and chanced to 0 after two consecutive 1 or 100 in input sequence? (12 marks)

University of Diyala
College of Engineering
Electronics Department

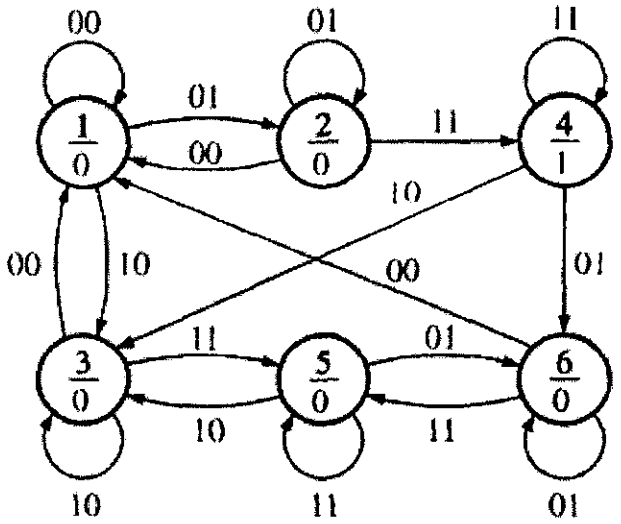
Final - year Examination
Second attempt/ 2011-2012

Class: 4rd
Subject : D.S.D.
Time: 3 Hour
Date: /9/2012

Note: answer all questions

Q_1 / A Mealy sequential network has two inputs and one output. If the total number of 1's received is ≥4 and at least 3 pairs of inputs have occurred, then the output should be 1 coincident with the last input pair in the sequence. Any way, if the total number of 0's received is ≥3 in two consecutive pairs of inputs have occurred, then the system should be reset the number of 1's that's counted and began new count. Derive a state graph and state table? (12 marks)

Q_2 / Design an asynchronous state machines whose state diagram is shown below. Locate all the essential hazard conditions and show how to eliminate them?



(12 marks)

Q_3 / answer ***A*** or ***B*** only:

A I) Define ***GAL***. Show the main different between ***GAL*** and other ***PLDs***?

II) Implement the functions (F_1 and F_2) by using **PAL12P8** (show output logic connection)? **$F_1=\sum(0,1,4,11,14)$, $F_2=\pi(1,3,4,6,9,12,14)$**

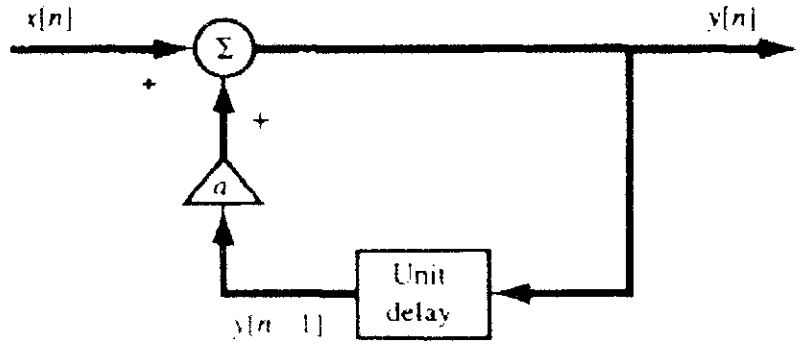
University of Diyala
College of Engineering
Dep. Of Electronic
Date: / /2012

Final - Year Examination
second attempt/ 2011-2012

Class: three
Subject: DSP
Time: 3hour

Note: - Answer four questions only

Q1: *The discrete-time system shown in Figure (1) consists of one unit delay elements and one scalar multipliers. Write a difference equation that relates the output* ***y[n]*** *and the input* ***x [n]****.*



Q2: *A system specified by the following difference equation:*

$$y(n) + 0.5\,y(n-1) = x(n) - 0.5\,x(n-1)$$

(1) Find and plot $20\log_{10} |H(e^{jw})|$ *versus W, if W = 0: π/4:2π.*

(2) Find and plot $\phi(e^{jw})$ *versus W, if W = 0: π/4:2π*

Q3: ***A-*** *Mention the applications of Digital Signal Processing (DSP).*

B- *Find* ***Y (Z)*** *for equation using* ***Z.T***

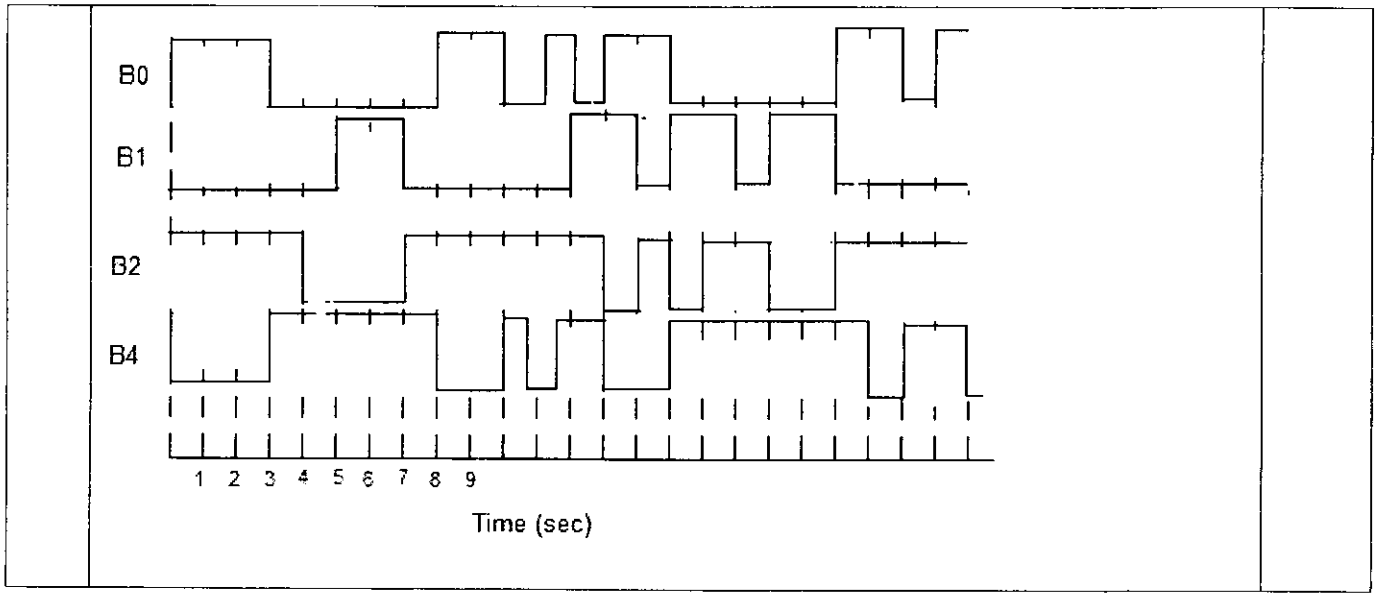
$$Y(n)-(3/2)y(n-1)+(1/2)y(n-2)=(1/4)^n$$

Q4: *If* ***x(n)=[1 2 3 3]****,and* ***h(n)=[1 1 2]****.Find* ***y(n)*** *by using digital convolution such that:-*

1. *Linear convolution.*
2. *Circular convolution.*
3. *Table method.*
4. *Matrix by vector method*

Q5: *Considering the sequence x(0)=1, x(1)=2, x(2)=3 and x(3)=4,given the* f_s*=100 Hz compute* ***DFT****.*

1. *Using the triangular window function.*
2. *Using the hamming window function*



Dr. Mohammed S. Saleh

University of Diyala
College of Engineering
Dep. Of com.& electronic
Final Exam/2nd Attempt

Class:3rd stage
Subject: Microprocessor
Year: 2012-2013
Time:3 hour

Note:-Answer Three questions with Q5

Q1	A)what are the meaning of the statements 1- PUSH B 2- CC sub1 3- RZ 4- OUT PORT2 5- CPI ABh	**25%**
Q2	(Choose only one) A) Draw the internal block diagram of the microprocessor, and explain the function of each block B) Explain the memory types and them properties.	**25%**
Q3	A) compute the value of X for the physical address a- FE890 = X : 34F0 b- 78FAE = 78DC : X B) write program to satisfy the logic expression , where u, v, w, x, and y are 8-bit variables store in memory start from ML 3500h respectively. $z = x + (u + v \cdot w).y$	**25%**

Q4	Consider the program of the instruction bellow, draw the flow chart then what are the output.
	MOV B,07H
	MVI C,06H
	CXY:
	CALL XYZ1
	MOV B,A
	DCR C
	JNZ CXY
	STA 5000H
	HLT
	XYZ1:
	MOV A,00
	MOV D,C
	N1:
	ADD B
	DCR D
	JNZ N1
	RET
		25%

Q5	Write program that generate the signals bellow continues, at the port2, where the microprocessor frequency 4 MHz. , assume all instruction need 4 T-state except branch instruction need (10 T-state) and instruction deal with 16-bits need (7 T-state).	**25%**

Q6:/ A) Determine the output SNR and ΔV_{min} in a DM system for a 3 volt maximum peak, 1 KHz sinusoidal signal sampled at 32 KHz without slop overload, and followed by a 4 KHz pre construction filter.

(B) Draw the block diagram of Zero Crossing Frequency discriminator then explain how to demodulate a FSK signal by using this demodulator.

A TABLE OF BESSEL FUNCTIONS $J_n(\beta)$

β	J_0	J_1	J_2	J_3	J_4	J_5	J_6	J_7	J_8	J_9	J_{10}
0.0	1.00										
0.2	0.99	0.10									
0.4	0.96	0.20	0.02								
0.6	0.91	0.29	0.04								
0.8	0.85	0.37	0.08	0.01							
1.0	0.77	0. 44	0.11	0.02							
1.2	0.67	0.50	0.16	0.03	- 0.01						
1.4	0.57	0.54	0.21	0.05	- 0.01						
1.6	0.46	0.57	0.26	0.07	0.01						
1.8	0.34	0.58	0.31	0.10	0.02						
2.0	0.22	0.58	0.35	0.13	0.03	- 0.01					
2.2	0.11	0 56	0 40	0.16	0.05	0.01					
2.4	0.00	0.52	0.43	0.20	0.06	0.02					
2.6	- 0.10	0.47	0.46	0.24	0.08	0.02	- 0.01				
2.8	- 0.19	0.41	0.48	0.27	0.11	0.03	- 0.01				
3.0	-0.26	0.34	0.49	0.31	0.13	0.04	0.01				
3.2	- 0.32	0.26	0.48	0.34	0.16	0.06	0.02				
3.4	- 0.36	0.18	0.47	0.37	0.19	0.07	0.02	- 0.01			
3.6	- 0.39	0.10	0.44	0.40	0.22	0.09	0.03	- 0.01			
3.8	- 0.40	0.01	0.41	0.42	0.25	0.11	0.04	0.01			
4.0	- 0.40	- 0.07	0.36	0.43	0.28	0.13	0.05	0.02			
4.2	- 0.38	- 0.14	0.31	0.43	0.31	0.16	0.06	0.02	- 0.01		
4.4	- 0.34	- 0.20	0.25	0.43	0.34	0.18	0.08	0.03	- 0.01		
4.6	- 0.30	- 0.26	0.18	0.42	0.36	0.21	0.09	0.03	0.01		
4.8	- 0.24	- 0.30	0.12	0.40	0.38	0.23	0.11	0.04	0.01		
5.0	- 0.18	- 0.33	0.05	0.36	0.39	0.26	0.13	0.05	0.02	- 0.01	
5.2	- 0.11	- 0.34	- 0.02	0.33	0.40	0.29	0.15	0.07	0.02	- 0.01	
5.4	- 0.04	- 0.35	- 0.09	0.28	0.40	0.31	0.18	0.08	0.03	- 0.01	
5.6	0.03	- 0.33	- 0.15	0.23	0.39	0.33	0.20	0.09	0.04	0.01	
5.8	0.09	- 0.31	- 0.20	0.17	0.38	0.35	0.22	0.11	0.05	0.02	- 0.01
6.0	0.15	- 0.28	- 0.24	0.11	0.36	0.36	0.25	0.13	0.06	0.02	- 0.01
6.2	0.20	- 0.23	- 0.28	0.05	0.33	0.37	0.27	0.15	0.07	0.03	- 0.01
6.4	0.24	- 0.18	- 0.30	- 0.01	0.29	0.37	0.29	0.17	0.08	0.03	0.01
6.6	0.27	- 0.12	- 0.31	- 0.06	0.25	0.37	0.31	0.19	0.10	0.04	0.01
6.8	0.29	- 0.07	- 0.31	- 0.12	0.21	0.36	0.33	0.21	0.11	0.05	0.02
7.0	0.30	0.00	- 0.30	- 0.17	0.16	0.35	0.34	0.23	0.13	0.06	0.02

Good luck

Examiner : Mr. Dheyaa Tareq

University of Diyala
College of Engineering
Electronics Department

Final - year Examination
Second attempt / 2011-2012

Class: 3rd
Subject :Communication
Time: 3Hours
Date: Sep. 2012

Note: Answer only five questions.

Note : 12 Marks for each question

Q1: A given voltage signal $f(t)=4\cos^2 20\pi t+4\cos 30\pi t$ across 4Ω .

1- Determine PSD of f(t). 2- Sketch $S_f(w)$.

3- Calculate the average power, both in the time domain and in frequency domain.

Q2: A given FM transmitter is modulated with sinusoidal input $f(t)=10\cos 200\pi t$ and the modulation index is (4.4). The no modulation power is 10 watt across 50 Ω resistive load . Determine :-

1- The modulation constant (K_f).

2- The ratio of the average power in the sum of the third and fourth order sidebands to the power in all remaining sidebands excluding carrier.

3- The bandwidth of the modulated signal (use significant sidebands).

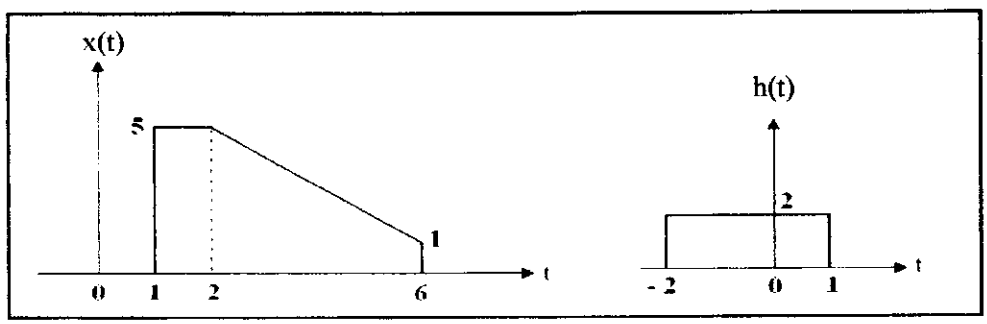
1- **Q3:/ A)** An AM signal of 50 watt power is transmitted in a frequency range 100-103 KHz in a transmission channel. If the Additive White Gaussian noise PSD (two-sided) in the transmission channel is 10^{-6} watt/ Hz. Find SNR at the receiver .

(B) Twenty five signals, fifteen of them each one has 3 KHz bandwidth, and the others ten each one has bandwidth of 4.5 KHz, all the signals are FDM/ DSB-SC multiplexed then RF modulated by using (AM/DSB-LC) modulator.

1- Calculate minimum multiplexing and final transmission bandwidths.

2- Calculate multiplexing and final transmission bandwidths if 0.6 KHz guard band is allowed between each two signals and below the first signal.

Q4: Evaluate the convolution $(x(t)\otimes h(t))$ for the functions shown in figure below.



Q5: A message signal $m(t)=4\cos(200\pi t)+2\cos(800\pi t)$ modulated a carrier signal $c(t)=6\cos(2*10^4\pi t)$ by using AM/DSB-SC modulation :

1- Write an expression for the modulated signal .

2- Draw the amplitude spectrum of the modulated signal .

3- Verify Parseval power theorem in finding the sidebands power.

4- Calculate total power, transmission efficiency and the transmission bandwidth.

Good luck

Examiner : Mr. Dheyaa Tareq

7) *Error correction and retransmission.*
8) *Reliable process-to-process message delivery*
9) *Responsibility for delivery between adjacent nodes.*
10) *Reassembly of data packets.*

Q4\ Fill the following with suitable word:

1) ..... are the transfer of data from one device to another via some form of transmission medium.

2) A data communications system must transmit data to the correct destination in ..... and ..... manner.

3) The five components that make up a data communications system are the ....., ..., ..., ..., and .....

4) ....., ..., ..., ..., and ..... are different forms of information.

5) Data flow between two devices can occur in one of three ways: .....,....., or .....

6) A.....is a set of communication devices connected by media links.

7) A ..... is a set of rules that govern data communication.

8) A network can be categorized as.....,.....and.....

9) BNC connectors are used by ..... cables.

10) the network support layers are : .....where the user support layer are .....

11) Devices may be arranged in a ....., ..., ..., or ..... topology.

12) The inner core of fiber optic is .....in composition.

13) If original data is (1110111 1101111 1110010 1101100 1100100), So the form of data which will be sent using simple parity check is ..... .

14) If original data is (1100111 1011101 0111001 0101001), So the form of data which will be sent using two-dimensional parity check is ..... .

15) If original data is (100100) and the divisor polynomial is ($X^3 + X^2 + 1$), So the procedure of CRC generator are ..... And the form of data which will be sent is ..... .

GOOD LUCK

Examiner
Adham. H. Al-rubiey

University of Diyala
College of Engineering
Dep. Of Electronic
Date: / /2012

Final Examination/ Second attempt
2011 - 2012

Class: 3rd
Subject: Computer Networks
Time: 3hours

Note:- Answer all questions

Q1 / (Answer two only):

A-For each of the following four networks, discuss the consequences if a connection fails.

a. Five devices arranged in a mesh topology

b. Five devices arranged in a star topology (not counting the hub)

c. Five devices arranged in a bus topology

d. Five devices arranged in a ring topology

B- *Draw the sender and receiver windows for a system using Go –Back-N ARQ. given the following :*

1.Frame 0 is sent :frame 0 is acknowledged.

2.Frames 1 and 2 are sent : frame 1 and 2 are acknowledged.

3.Frames 3,4 and 5 are sent : frame 4 is acknowledged; timer for frame 5 is expire.

4.Frame5,6 are sent : frames 4 through 7 are acknowledged.

C- *Explain what is the suitable size of sender window size in GO –BACK -N ARQ by drawing the sender and receiver windows for two system different in sender window size(one of them* 2^m *and other* $2^m - 1$*)?*

Q2/ (Answer two only) :

A-by using hamming code transmitted this data (1001101), then if the receiver detect that there are a single bit error, how you will detect the position of that bit (suppose corrupted bit at position 3) ?

B- *what are the performance of parity check in one and two dimension? Draw parity check concept steps ?*

C- *In Stop –and-wait ARQ system, the bandwidth of line is (1Mbps), and (1 bit takes 20 ms to make a round trip).if the system data frame are (1000 bits) in length, what is the utilization percentage of the link? What is the utilization percentage of the link if use GO-BACK- N ARQ with a (15) frame sequence?*

Q3/

A- Assume a data stream s made of ten 0s. encode this stream, using the following encoding schemes?

a-Unipolar. B-NRZ-L . C- NRZ-I. D- RZ. E- Manchester.
F-differential Manchester. G-AMI. H- MLT-3

B-Match the following to one or more layers of the OSI model:

1) *Route determination.*
2) *Flow control.*
3) *Interface to physical world.*
4) *Provides access to the network for the end user.*
5) *Packet switching.*
6) *Communication directly with user's application program*

b-Give the circuit diagram of fast half wave rectifier using op-amp to provide a rectification up to 100 khz

Q_4. For the following information's, if you are sure that the information's are correct write YES if its not write NO .If you are not sure leave it otherwise you are loss mark of a correct answer for each wrong answer.

1. In the active region for common emitter transistor, there are two condition must satisfied ,firstly EB must be connected as reverse -biased, secondly CB must be connected forward -biased .
2. Using simplified model in small signal analysis. The approximate values of the current gain; for CE ,CC & CB are equal (–hfe),(1+hfe),(hfe/(1+hfe)) respectively.
3. The gain of an amplifier using negative FB type current series is called Transconductance (G_{M}).
4. Perfect balance is one of c/s of ideal op amp, which equal to zero voltage.
5. In buffer of op amp, the voltage gain A_v =1, phase shift =0 .
6. For an amplifier, using negative FB type voltage series, $Z_{i/p}$ decrease &$Z_{o/p}$ increase.
7. Multistage amplifier, is a technique used for obtaining high voltage gain & low BW.
8. For FB technique ,there is loop factor .Its unit is ohm.
9. The function of voltage comparator of op amp is to determine if the input voltage is greater or less than a reference voltage level .
10. Fast half wave rectifier using op amp can be used to provide a rectification up to 100 kHz.

Q_5.a. For the circuit shown in Figure (2) Find V_{out} if V_{in}=0.01616 volt, α =1,IES=40 mA,T=300k .

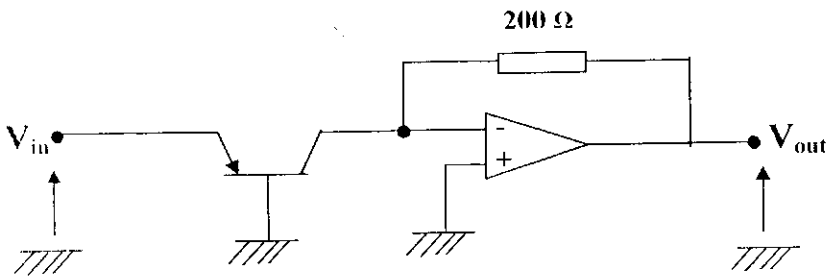
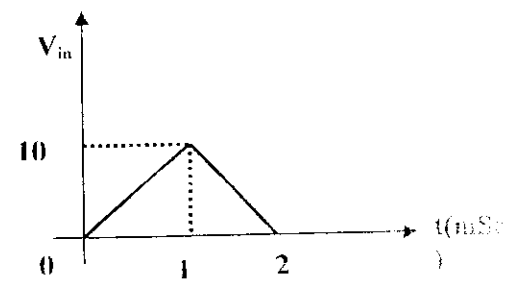
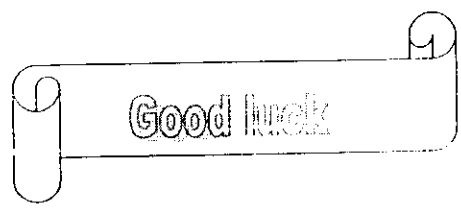


Fig.(3)



Fig(4)

b. For the input voltage shown in Figure(4), draw the output voltage using op-amp as differential with RF=4KΩ,C=0.1μF.



مدرس المادة

رئيس القسم

Dr. Eng. Khalid Awaad

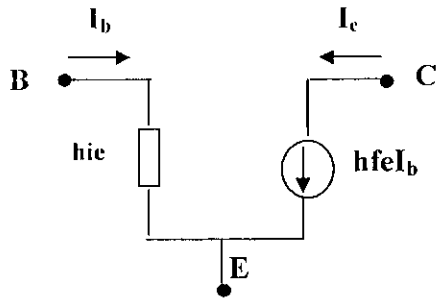
University of Diyala
College of Engineering
Dep. Of Electronic Engineering

Final - Year Examination
Second attempt/ 2011-2012

Class:3 th year
Subject:Analog Electronic ii
Time: 3 hour
Date: 5 /9 / 2011

Note:- Answer five questions including (Q_2), 15marks for each question

Q_1. Use the approximate hybrid model, which is shown in Figure (1) to simplify the calculation of CC configuration , (A_I , R_i , A_v , R_o) .



Fgure (1)

Q_2. Figure (2) shows common emitter transistor amplifier ,if hie =2k Ω, hfe=100 ,hre=hoe ≈ 0, $c_{b'c}$=2pF, $c_{b'e}$=20pF, c_{ce}=2pF, cw_i=5pF, cw_o=8pF.

Answer the following :

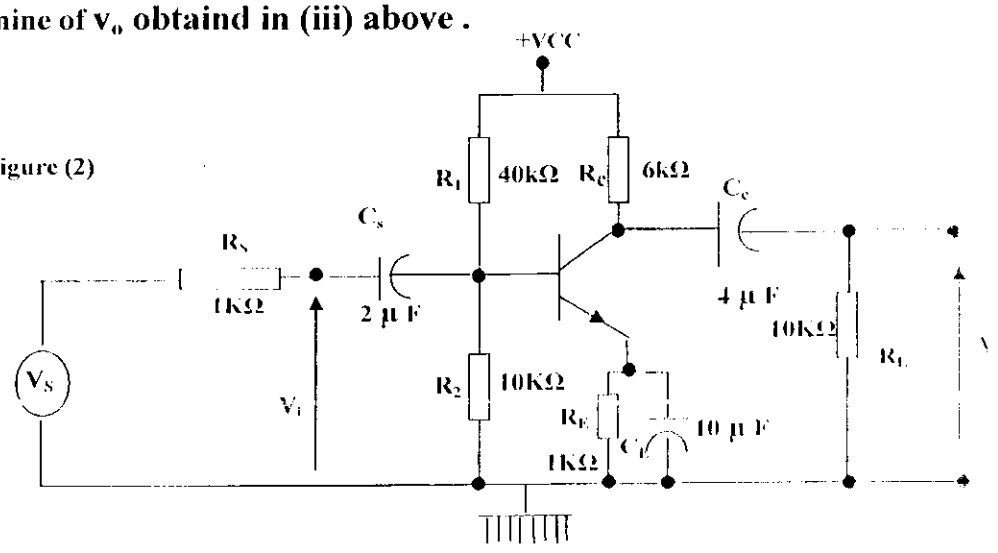
(i) Calculate f_L, f_H ,A_m & A_I.

(ii) Sketch the gain and phase response individually.

(iii) Find v_o if v_i=4 cosw_t for frequencies equals 20 khz & 200 khz respectively

(iv) Plot the time domine of v_o obtaind in (iii) above .

Figure (2)



Q_3. a- Four identical amplifier stages are connected in cascade if the gain of each stage is 100,and bandwidth is 300 khz. Find the overall gain in dB& bandwidth of the cascade amplifier.

UNIVERSITY OF DIYALA
Eng . Collage
Electronic Dep

FINAL EXAM
2011-2012

Sub. ANTENNA
Class: 3rd
Time: 3hrs

Attempt Four Questions

Q1- Low power short – range radar uses semi conductor through out. Including Atunal – Diode R.F amplifier which gives it an overall noise Figure of 4.77 dB, if the Antenna diameter is 1 meter, the I.F band width is 500 Khz , the operating frequency is 8 Ghz , and the radar set at a maximum distance of 12 Km, what must be the peak transmitted pulse power ? **(15 Marks)**

Q2- (A) Find the distance at which the induction field equal the radiation field at frequency of 50 Khz?
(B) Find the beam area (beam solid angle): for an antenna of maximum effective aperture 0.119 λ^2? **(15 Marks)**

Q3- An antenna of physical aperture (AP) of 100m^2, gain of 23 dB and the directivity of 23.5 dB, calculate the following at frequency of 150 Mhz :

A) Effective aperture (Ae).
B) Maximum effective aperture (Aem).
C) Aperture efficiency (Eap).
D) Radiation efficiency (e). **(15 Marks)**

Q4- Find the magnetic vector potential of an doublet antenna at a point P, Distance r from the doublet and at elevation angle Θ by using the field theory? **(15 Marks)**

Q5- Calculate the minimum peak Transmitter power needed in a pulsed radar required to detect a target of 10 m^2 echoing area, at a range of 125Km, given the following system parameters

Operating frequency	**1.2 Ghz**
Receiver sensitivity	**- 102 dbm**
Antenna gain	**35 dB**
Atmospheric attenuation	**0.008 dB/Km**

How would the pulse length and pulse Repetition frequency of the radar be determined? **(15 Marks)**

With best Wishes

Lecturer
Mohammed Al-Sumaidaee

University of Diyala
College of Engineering
Dep. Of Electronic

Final - Year Examination
Second attempt/ 2011-2012
Note: Answer Fife Questions

Class: 3th
Subject :Analysis
Time: 3hour
Date: / /2012

Q1	/ If $A^4 = \begin{bmatrix} 103 & 102 \\ 153 & 154 \end{bmatrix}$, $P^{-1} = \frac{1}{5}\begin{bmatrix} 1 & 2 \\ -1 & 3 \end{bmatrix}$ & *diagonal matrix is* $\Lambda_2 = D(a,b)$.From theinformation above , Find (1)values a & b (2) For a<0 & b>0 find matrix A(3)Find A^{25} *and* $\sin A^2$
Q2	Solve the $(x\text{-}x^2)y'' + (1-5x)y' - 4y = 0$ find $y_1$only
Q3	Solve$\frac{\partial^2 y}{\partial x^2} - \frac{\partial y}{\partial x} + \frac{\partial y}{\partial z} = 0$ by the separation of variables.
Q4	Use Z- Transform to solve the difference equation. $x(n+3) + x(n) = 0, \quad x(0) = x(1) = 0, \quad x(2) = 1.$
Q5	Find $Z^{-1}\left(\frac{z}{z^2-z+0.5}\right)$
Q6	Solve the syster ı of differential equations $\frac{dt}{dx} = ty + x$ $\frac{dy}{dx} = xy + t \quad t(0) = 1, y(0) = -1$

With best wishes
Bushra. A

Diyala University | Final Examination | Subject: Mathematic

College of Engineering | 2011-2012 | Class:2nd

Dept: Electronic Eng. | Second Attempt

Note: Answer Fife Questions Time:3hrs

Q1 /Use Matrix inversion to solve the following system of equations:

$$\frac{dz}{dx}+\frac{dz}{dy}-\frac{dz}{dt}=2$$

$$\frac{dz}{dx}-\frac{dz}{dy}+\frac{dz}{dt}=1$$

$$2\frac{dz}{dx}+2\frac{dz}{dy}+\frac{dz}{dt}=5.\text{such that } z=f(x,y,t)\&f(0,0,0)=0$$

Q2/Find the Taylars series for the $f(\theta)=e^{\sin\theta},\theta=\frac{\pi}{2}$

Q3/ If $z=f(x,y)$ $,u=x-y$ & $v=x^2-y^2$ show that

$$\frac{\partial z}{\partial v}=\frac{\frac{\partial z}{\partial x}+\frac{\partial z}{\partial y}}{2u}$$

Q4/Find the angle between the plane $-2x+y-2z=0$&the plane alitermine by the points, $P_1(0,0,0), P_2(2,2,0)$ and $P_3(0,-1,2)$.

Q5/Use polar coordinates. Find area of the region inside the circle $x^2-4x+y^2=0$

And outside the circle $x^2-2x+y^2=0$.

Q6/Solve the following 1/ $y''-y'=e^x\cos x$ (using the variation of parameters)

2. $y''-3y'+2y=e^{-x}$ $y(1)=0$&$y'(1)=0$ (by Laplace)

With best wishes

Bushra. A

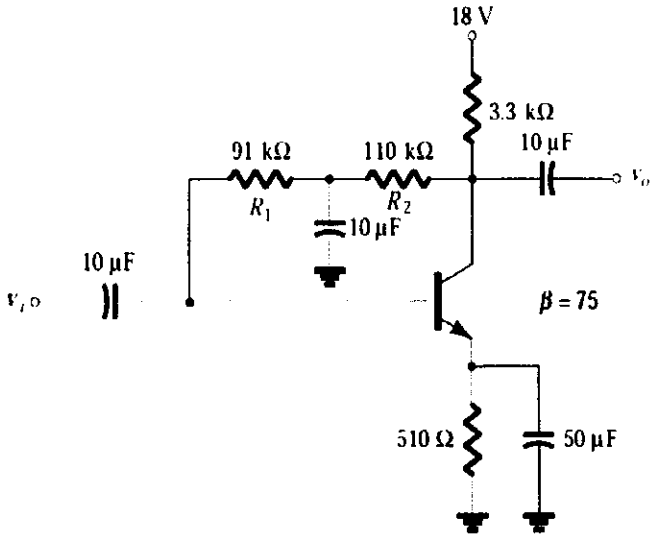


Figure (1)

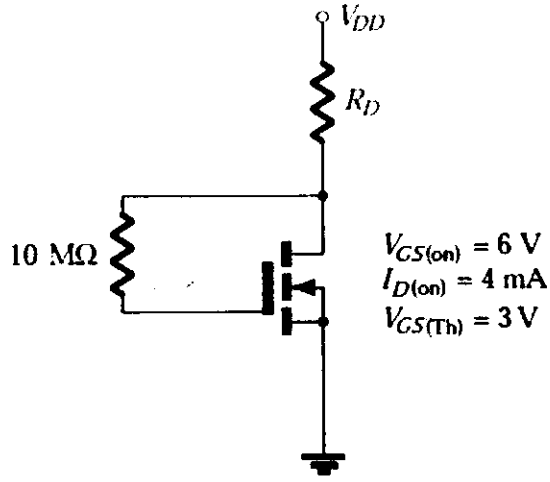


Figure (2)

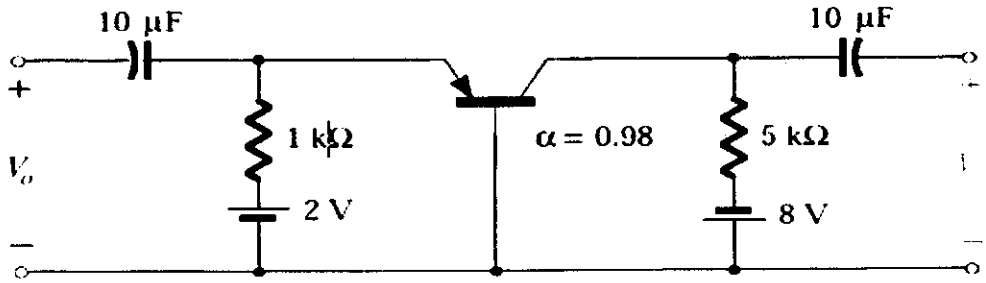


Figure (3)

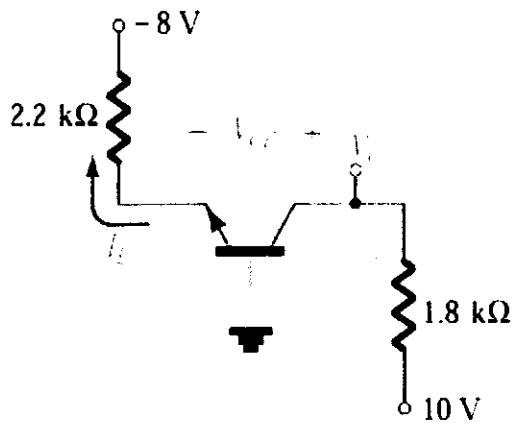


Figure (4)

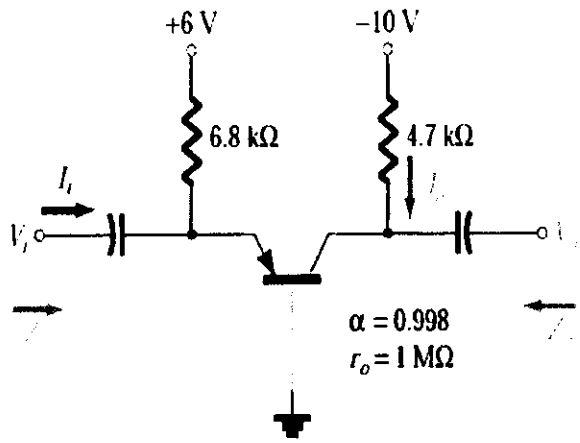


Figure (5)

University of Diyala
College of Engineering
Dep. Of Electronic
Date: 10 / 9 /2012

Final - Year Examination
Second attempt/2011-2012

Class: two
Subject: electronic I
Time: 3hour

Note:- Answer four questions only

Q1:-A- *Determine the dc level of I_B and V_C for the network of* ***Figure (1).***

B- *What is the expected amplification of a BJT transistor amplifier if the dc supply is set to zero volts?*

Q2:-A- *The levels of V_{DS} and I_D are specified as V_{DS} =1/2(V_{DD}) and I_D =I_D (on), for the network of* ***Figure (2)*** *Determine the level of V_{DD} and R_D.*

B- *What is the major difference between a bipolar and a unipolar device?*

Q3:-A- *For the network of* ***Figure (3)****, Determine.*
a) *re.* ***b)*** *Zi.* ***c)*** *Zo.* ***d)*** *Av.* ***e)*** *Ai.*

B- *Which of the transistor currents is always the largest? Which is always the smallest? Which two currents are relatively close in magnitude?*

Q4:- *A- Fill in the blank:-*

1- *The ..... techniques are used to reduce drift of Q-point.*
2- *In the dc mode the levels of Ic and Ib are related by a quantity called .....*
3- *Tuned amplifier means .....*
4- *The main feature of the Darlington connection is that .....*
5- *S_{VBE} =..... for the DC feedback biasing of the BJT.*

B- *For the network of* ***Figure (4)****, determine:* ***a)*** *I_E.* ***b)*** *V_C.* ***c)*** *V_{CE}.*

Q5:- *A-Design a tuned amplifier to be used as an intermediate frequency (I.F) in radio receiver to have f_0 =500 kHz, B.W=10 kHz .use a JFET with gm=5ms, rd=40kΩ, Rl=40KΩ, C=1nf Calculate the midband voltage gain, fl, fh and sketch the frequency response?*

B-*For the common-base configuration of* ***Figure(5)*** *determine I_E.*

GOOD LUCK

TAHREER.AL-KALEDI

University of Diyala
College of Engineering
Dep. Of Electronic
Final Exam/2st Attempt

Class:2rd stage
Subject: ديمقراطية
Year: 2012-2013
Time:2 hour

Note:-Answer four questions only

س١ :	عدد أهم أشكال النظام التمثيلي مع الشرح.	١٥
س٢:	تكلم عن أهم الأسس التي يعتمد عليها التنظيم الداخلي للمجلس النيابي	١٥
س٣:	تكلم عن مفهوم وتكوين هيئة الناخبين	١٥
س٤:	بين مواطن الضعف والقوة في الديمقراطية شبهة المباشرة حسب رأي الفقهاء الدستوريين	١٥
س٥:	تكلم عن نظام تمثيل المصالح مبينا أهم الاسس التي يعتمد عليها	١٥

Good Luck

Head of Dep.: .....

Name: .....

Lecturer: M.S.C

Name: Mohammed Ali

Diyala university College of engineering Department of Electronics	Final-Year examination 2011-2012	Clss:2nd Subject:Electromagnetics Time: Three hours
Note: Answer six questions (10) marks for each question		

Q1: The circular disk $r \leq 1$ m, $z=0$ has a chare density $\rho_s = 2(r^2+25)\, e^{-10r}$ .Find E at (0,0,5) .

Q2: A charge configuration in cylindrical coordinates Is given by $\rho = 10e^{-x}$, where $x=r^2$ .Find D using Gauss' law .

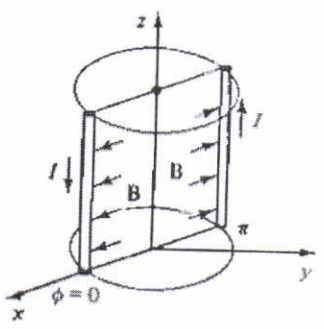
Q3: A uniform sheet of charge , $\rho_s = (1/6\pi)$ nC/m^2, is at $x=0$ and a second sheet , $\rho_s = (-1/6\pi)$ nC/m^2, is at $x=10$ m.Find V_{AB}, V_{BC} and V_{AC} for A(10m,0,0), B(4m,0,0) and C(0,0,0) .

Q4:The electric field intensity at a point on a conductor is given by $E = 0.2a_x - 0.3a_y - 0.2a_z$ V/m .What is the surface charge density at the point .

Q5: Given $E = 2a_x - 3a_y + 5a_z$ V/m in the region $z<0$,where $\epsilon_r = 2$, find E in the region $z>0$,for which $\epsilon_r = 5$.

Q6: A radial field $H = 3\times10^6 \cos\phi\, a_r$ A/m exists in a free space .Find the magnetic flux ϕ crossing the surface defined by $-\pi/4 \leq \phi \leq \pi/4$, $0 \leq z \leq 1$ m .

Q7: Two conductors of length 4 m are on a cylindrical shell of radius 2 m centered on the z axis, as shown below .
Currents of 10 A are directed as shown and there is an external field $B = 0.5a_x$ T at $\phi = \pi/2$ and $B = 0.5a_x$ T at $\phi = 3/2\,\pi$ .Find the sum of all forces and the torque about the axis .



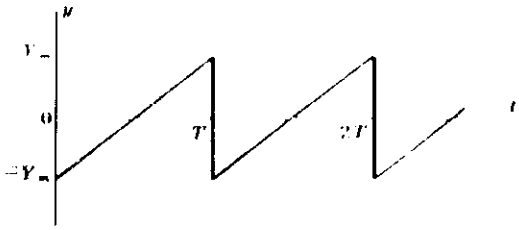


FIG (1)

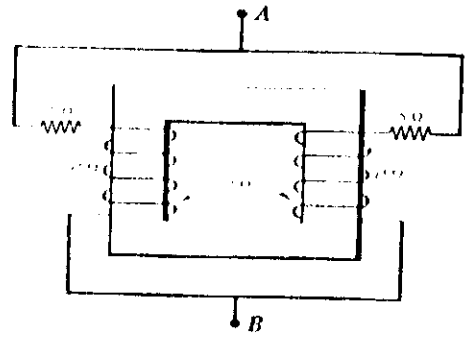


FIG (2)

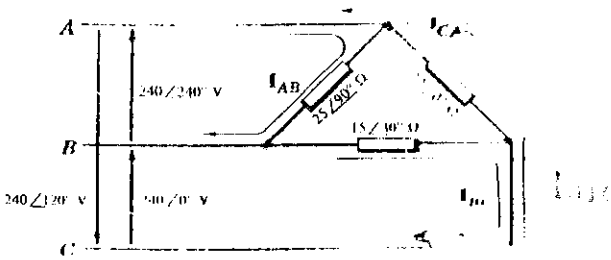


FIG (3)

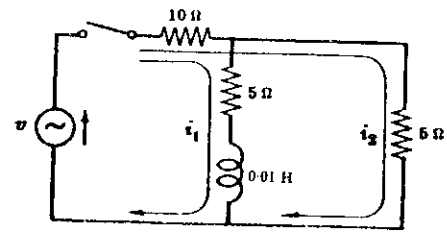


FIG (4)

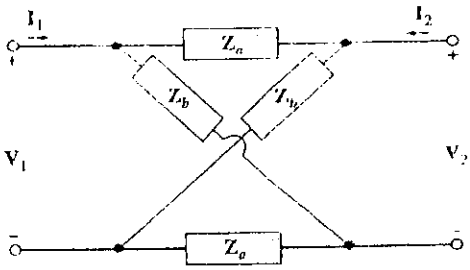


FIG (5)

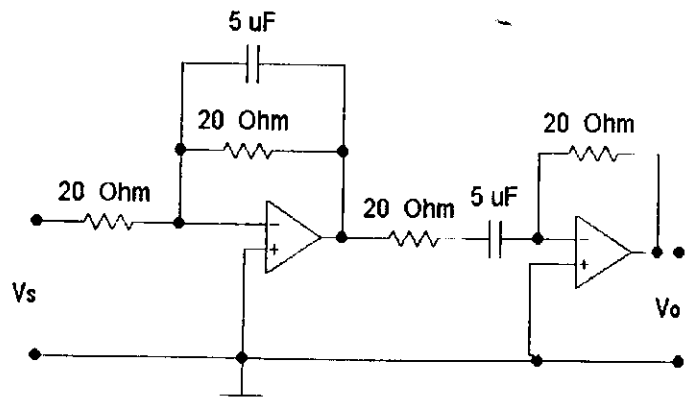


FIG (6)

Diyala university College of engineering Department of Electronics	Final-Year examination 2011-2012	Clss:2nd Subject: Electric circuits Time: Three hours
Note: Answer five questions (12) marks for each question		

Q1:
Determine Y_{rms} and Y_{av} of the waveform shown in Fig (1) .

Q2
Referring to the coupled circuit of Fig (2) reverse the winding of one coil and find the equivalent impedance.

Q3:
A three-phase ,three-wire , 240 volts ,CBA system supplies a delta-connected load in which $Z_{AB} = 25\angle 90°$ohms , $Z_{BC} = 15\angle 30°$ohms ,and $Z_{CA} = 25\angle$ ohms .Find the line currents and the total power for the circuit shown in Fig (3) .

Q4:
In the two-mesh network shown in Fig (4) the switch is closed at t=0 .
The voltage source is given by v= 150 sin(1000t) volts .
Find the mesh currents i_1 , and i_2 .

Q5:
Find the Z-parameters of the two-port circuit shown in Fig (5) .

Q6:
Determine the type of the active filter shown in Fig (6)
Where all resistors are equal and each has a value of 20 ohms ,
and also all capacitors are equal and each has a value of 5μF .

Q4/ A 50-h.p. (37.3 kW), 460-V d.c. shunt motor running light takes a current of 4 A and runs at a speed of 660 r.p.m. The resistance of the armature circuit (including brushes) is 0.3 Ω and that of the shunt field circuit 270 Ω. Determine when the motor is running at full load **(i)** the current input **(ii)** the speed. Determine the armature current at which efficiency is maximum.

****

Q5/ The parameters of a 2300/230 V, 50-Hz transformer are given below :

$R_1 = 0.286\ \Omega$ $R_2' = 0.319\ \Omega$ $R_0 = 250\ \Omega$

$X_1 = 0.73\ \Omega$ $X_2' = 0.73\ \Omega$ $X_0 = 1250\ \Omega$

The secondary load impedance $Z_L = 0.387 + j\ 0.29$. Solve the exact equivalent circuit with normal voltage across the primary to find total cu loss, core loss and efficiency of the transformer.

****

Q6/ The S.C. test on a 1-phase transformer, with the primary winding short-circuited and 30 V applied to the secondary gave a wattmeter reading of 60 W and secondary current of 10 A. If the normal applied primary voltage is 200, the transformation ratio 1 : 2 and the full-load secondary current 10 A, calculate the secondary terminal p.d. at full-load current for (a) unity power factor (b) power factor 0.8 lagging (c) power factor 0.8 leading.

****

GOOD LUCK

Examiner : Asst., Lecturer Wisam N. AL- Obaidi

University of Diyala *Engineering College* *Electronic Department*	*Final-Year Examination* *Year (2011-2012)*	*Power & Electrical Machines* *2nd Class* *Time : 3 Hours* *Date : / /2012*

Note: Answer five questions only

Q1/ A short-shunt compound d.c. Generator supplies a current of 100 A at a voltage of 220 V. If the resistance of the shunt field is 50 Ω, of the series field 0.025 Ω, of the armature 0.05 Ω, the total brush drop is 2 V and the iron and friction losses amount to 1 kW, find, (*a*) the generated e.m.f. (*b*) the copper losses (*c*) the output power of the prime-mover driving the generator and *(d)* the generator efficiency.

****

Q2/ Fill the following blanks with suitable words,

1) ..... spread out the flux in the air-gap.
2) Lap winding is suitable for ..... voltage and ..... current.
3) ..... loss is proportional with square of frequency.
4) Standing loss consists of ..... and ..... .
5) ..... motor can never be started on no-load.
6) Mechanical characteristic of dc motor can be defined as the relation between ..... and ..... .
7) ..... motor have fairly constant speed and medium starting torque.
8) ..... type transformers are preferred for high voltage.
9) Core loss and no-load current for transformer can be found from ..... Test.

****

Q3/ A long-shunt motor running on no-load takes 5 A at 200 V. The resistance of the shunt field circuit is 150 Ω, series field circuit is 0.05Ω and of the armature 0.1 Ω. Determine the output and efficiency of motor when the input current is 120 A at 200 V.

****

University of Diyala
College of Engineering
Dep. Of Electronics .
Date: 3 / 9/2012

Final - Year Examination
Second attempt/2011-2012

Class: 2nd stage
Subject: Digital-Elect
Time: 3hour

Q1/ a / using shift register to convert the following serial data (001101) in parallel out draw the circuit and the data output if the output of the register begin with (110010)

Q1/b/ whats the output voltage for six stage ladder network using (4.5 v=1) and (ov=0) for

a) 001101
b) 000111
c) 111000
d) 000011

Q2/ design a synchronous counter which F.F triggered with positive edge that has the following sequence (2,6,8,5,11,14,7) using J-K FF

Q3/a / draw and prove how can to use a CMOS as a NOR gat circuit.

b/ draw the circuit diagram of 555 timer determine the value of R1 for pulse width of (1 ms) and c1 = 0.01 mf for 555 monostable circuit .

Q4/ answer only two

a/ draw and test the circuit of d irect simultaneous method if (parallel A/D convertor if (VR = 10V)

b/ Draw the logic digram of the product of sums expression and Find the transition table

$Y_2 = X_1 y_2 + \bar{X}1\bar{X}2$

$Y_1 = x_1\bar{x}_2 + (\bar{x}_1 + x_2)\, y_1$

c/ Avoid a hazard in sequential circui $Y=X1X2+X2Y+X1Y$.

Q4) Answer A or B

A. The position of a particle along a straight line is given by $s = (t^3 - 9t^2 + 15t)\ m$, where t is in second. Determine its maximum acceleration and maximum velocity during the time interval $0 \le t \le 10\ s$.
(10 marks)

B. Steel rod is $2.2\ m$ long and must not stretch more than $1.2\ mm$ when a $8.5\ KN$ load is applied to it. Determine the normal stress caused by the load, when $E = 200GPa$. (10 marks)

Q5) The jet plane travels along the vertical parabolic path as shown in Figure (4). When it is at point A it has a speed of $200\ m/s$, which is increasing at the rate of $0.8\ m/s^2$. Determine the magnitude of acceleration of the plane when it is at point A.
(10 marks)

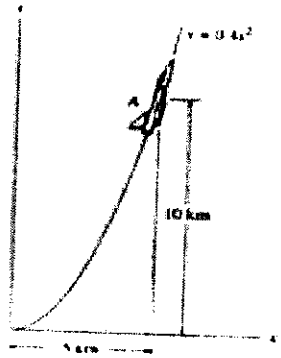


Figure (4)

Q6) Determine the constant speed of the passengers on the amusement-park rid if it is observed that the supporting cables are directed at $\theta = 30°$ from the vertical. Each chair including its passenger has a mass of $80\ kg$ as shown in Figure (5). Also, what are the components of force in the n, t, and b directions which the chair exerts on a $50\ kg$ passenger during the motion?
(10 marks)

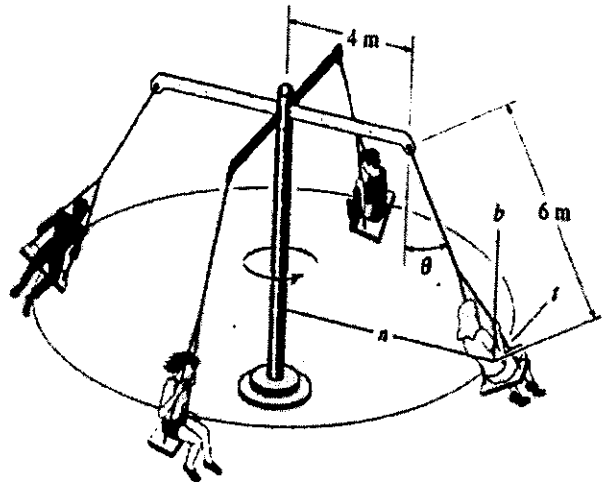


Figure (5)

Good Luck

Final Examination (2) 2011-2012

University of Diyala
College of Engineering
Electronics Department

Subject: Engineering Mechanics
Time : 3 hours
Date : / 9 / 2012

Q1) Answer A or B

A. Force of magnitude ***60 N*** is applied to the gear as shown in Figure (1.A). Determine the moment of ***F*** about point ***O***. (10 marks)

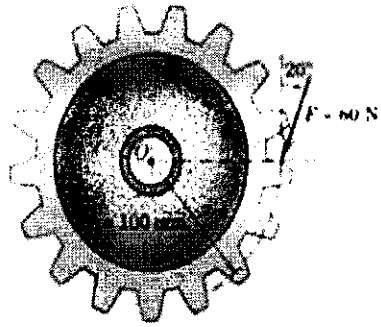


Figure (1.A)

B. The fore ***F*** has a magnitude of ***500 N*** as shown in Figure (1.B).Determine the x - y scalar components of ***F***. (10 marks)

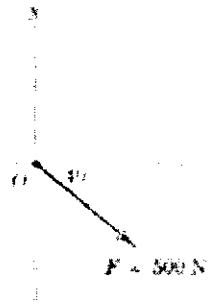


Figure (1.B)

Q2) Determine the coordinates of the centroid of the shaded area as shown in Figure (2). (10 marks)

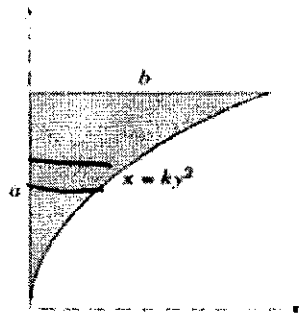


Figure (2)

Q3) Determine the forces in members ***GH*** and ***CG*** for the truss loaded and supported as shown in Figure (3). (10 marks)

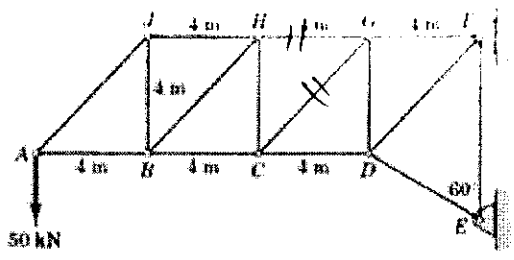


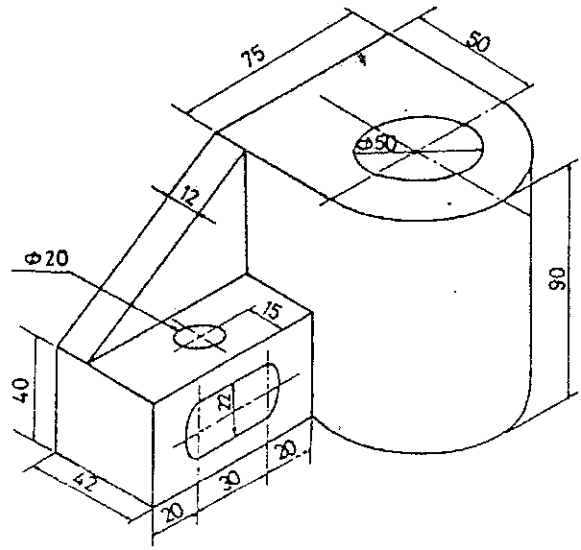
Figure (3)

University of Diyala
College of Engineering
Dep. Of Electronic
Date:

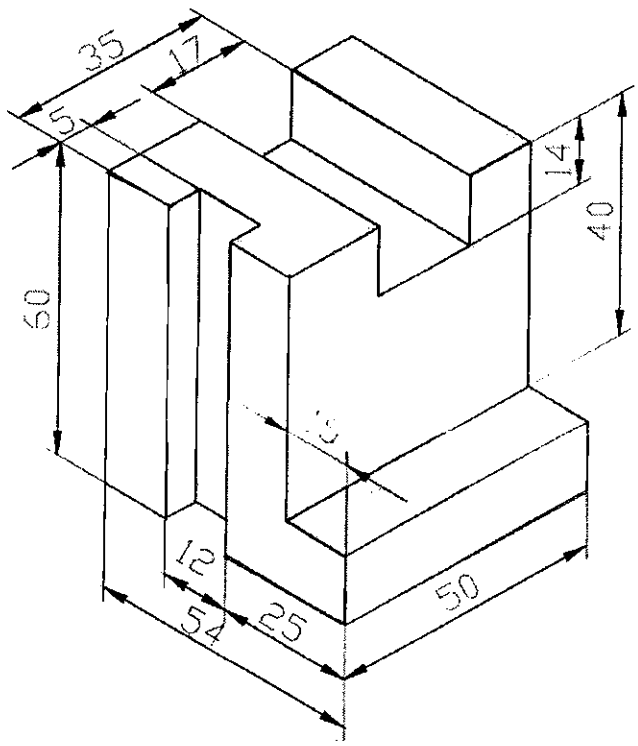
Final - Year Examination

Class: one
Subject: engineering drawing
Time: 3hour

س ١ : ارسم المساقط الثلاثة للشكل المجسم الموضح ادناه.



س ٢ : ارسم الشكل المجسم الموضح ادناه.



مدرس المادة
م.م هبة حسين

رئيس القسم

University of Diyala
College of Engineering
Dep. of Electronic Eng.
Final Exam/2nd Attempt

Class: 1st stage
Subject: programming
Year: 2011-2012
Time:3 hour

Note:-Answer Five questions only, 20 mark for each question

Q1 In MS Word , explain the functions of keys, when you press Ctrl with it .
Ctrl + A, B , C, E, F, G, H, I, J, L, N, O, P, Q, R, S, V, U, X, Z

Q2 Write a program with Quick Basic to compute the values of (Y) from the equations

$y = x^2 + 3x + 5$ if x < 0

$y = \cos^2 x + \sqrt{\sin x}$ if x > 10

$y = \tan^{-1} x - \frac{1}{x^3 + 1}$ if x lies between 5 and 8

$y = \ln x + e^{2x}$ for other values of x

Q3 Write a program with a Quick Basic to find result of matrix as shown in below

$$\begin{bmatrix} 2 & 4 & 1 \\ 1 & 5 & 2 \end{bmatrix} * \begin{bmatrix} 1 & 2 \\ 4 & 5 \\ 7 & 3 \end{bmatrix}$$

Q4 Q2 \ Explain the following icons in windows XP.

Q5 Draw a flowchart to input names of numbers of students and their degrees in 7 subjects then show the outputs of their names and universal acceptance. as shown in following :

universal acceptance.	averages
Medicine	80-90
Engineering	75-80
Science	70-75
Administration	65-70
Institutes	50 - 65

Q6 Explain how you can draw a graph represents the relationship between the voltage and the current for multi resistances by using Ms Excel.

University of Diyala | Final Year Exam | Subject: physics
College of Engineering | (2011-2012) | Time: 3hours
Dep of Electronic/power/communication | Date: /6/2012
Class: First

Note: Answer Four Question

Q 1: the threshold wavelength for photoelectric emission in tungsten is 2.300Å .what wavelength of light must be used in order for electrons with a maximum energy of 1.5 eV to be ejected. **(15M)**

Q2: For an n–type Ge sample the parallegram thick is 2mm the current is 10mA,perpendicular with current the magnetic field equal 0.1T,and Hall voltage is 1mv .find the Hall coefficient and electron density in semiconductor. **(15M)**

Q 3: the Bragg angle corresponding to the first order reflection from(hkl=111) planes a crystal is 30° when X–rays of wavelength 1.75A°are used. calculate lattice constant. **(15M)**

Q4: **A**: for an electron to be confined within such a nucleus, the uncertainty in its position may not exceed (10^{-14}m) the corresponding uncertainty in the electrons momentum. **(7.5M)**

B: explain the following: (1- covalent bonding , 2- the ionic bonding, 3-lyman series, 4-balmer series) **(7.5M)**

Q5:A rod of n-type germanium 6mm long, 0.05mm radius has an electrical resistance 120Ω .if ni=$2.5*10^{13}cm^{-3}$ assume of the mobility μ_n=3900 cm^2/v.sec,μ_p=1900cm^2/v.sec.what proportion of the conductivity. **(15 M)**

Constant : ϵ=11.9 ,ϵ_o=$8.8*10^{-14}$f/cm ,q=$1.6*10^{-19}$C ,K=$1.38*10^{-23}$J/k, C=$3*10^8$m/sec Me=$9.11*10^{-31}$kg, h=$6.6*10^{-34}$J.sec, R=$1.097*10^7$ m^{-1}.

Wish you good luck

Examiner
Farhan A. Mohammed

University of Diyala
College of Engineering
Dep. Of Electronic

Final - Year Examination
Second attempt/ 2011-2012
Note: Answer five Questions

Class: 1St
Subject : Math.
Time: 3hour
Date: / /2012

Q1/	find the equations of the perpendicular tangent at y=1 to the curve $\sqrt{xy^2}=3xy+2$.
Q2/	By concept the vectors, show that if the diagonals of a rectangle are orthogonal then the rectangle is square.
Q3/	Find the volume of the solid generated by revolving $y = 4x - x^2$ of x-axis about the line $y = 6$.
Q4/	Evaluate 1. $\int \frac{dx}{\sqrt{x^2+x+2}} dx$, 2. $\int \frac{dx}{1+sinx-cosx} dx$, $\int e^{2x} \cosh x dx$
Q5/	Evaluate1/ $\lim_{x\to 0} \frac{Ln \cot x}{e^{cscx^2 x}}$ 2/ $\lim_{x\to 0} \left(\sqrt{e^x + 3x}\right)^{\frac{1}{x}}$ 3/ $\lim_{x\to \infty} \left(\frac{Lnx}{x} - \frac{1}{\sqrt{x}}\right)$
Q6/	/What is the value of λ if : $\begin{vmatrix} sin\lambda & 0 & -1 \\ 0 & sec\lambda & 1 \\ cos\theta\lambda & -2 & 0 \end{vmatrix} = 4\int_0^{\frac{\pi}{2}} \frac{sinx}{secx} dx$

With best wishes
Bushra. A