23 - 23

Q4- Write an essay

: Some students choose the colleges depending on their desire and some of them depend on their average "are you against or with this statement? express your opinion with examples to support your idea.

Q5. Use each of these words in a good sentence

1. Tensile strength 2.voltage 3. transformer 4.conduct 5.cable

Q6.Put the verb between brackets in the correct form :

1- bodies can (bend) in many ways.

2- electrons (bear) a negative charge

3- why radar (use) ? .

4- Alloys (divide) into several groups.

5- Only five minutes ago , the thermometer (read) 90 c.

6-pure copper can (draw) into wires .

Q7 .A. Give the meaning of the following words :-

1- flux 2- wind a wire 3-leak 4- distribute 5- transmit

B. Change the following numerals and simple equations into written form :

$\sqrt[3]{8}$, $\frac{x}{X}+\frac{y}{Y}=\frac{z}{Z}$, 12.5% , $-22\frac{4}{8}$, 0.37

GOOD LUCK

SAWSAN A ZASSIM

23

University of Diyala

Engineering College **Final Exam** **Stage: 1st class:**

Subject :English

power and Machinery **Time : 3 hrs**

Eng.Dept 2011-2012

****

Q1- **Answer the following questions:**

1- which steel is the softest ?

2- explain the process of electrolysis?

3- why the alternating current (AC) is so called ?

4- Give two uses for electrolysis.

5-why the primary cells do not have a long life

Q2- Give an example for each of the following Latin prefixes

di , geo , hydro , poly ,tri , semi

Q3- Fill each space with a word from the list.(choose 5 only)

Transistor , electrical , cut off, depend , circuit, produce

1- while we were on a holiday, the electricity supply was ....because we did not pay the electricity bill .

2- since ...... it is small ,it is used in rockets.

3- can light energy be changed into .....energy .

4- Generators .... electricity.

5. some devices do not .....on a photoelectric cell for their appliance

6- the light acts as a switch that completes an electric ......

University of Diyala/ college of engineering — Time: 3 hrs

Dept. of power & electrical machine — First year

Final exam (2011- 2012)/ second role

22

NOTE: ANSWER ONLY FIVE QUASTIONS

Q1/ What can you use the internet for? **10 marks**

Q2/ A- define Email **10 marks**

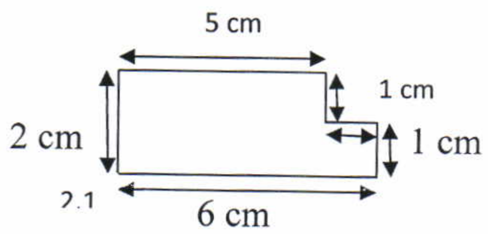
B- answer the following

What is the desktop contain?

How you can arrange icons? Explain the steps & account for how many type you can arrange them?

What are the parts of the Taskbar?

Q3/ Draw the figure that shown bellow by Autocad **10 marks**



Q4/ A- Hide column B then unhide it again? **10 marks**

B- How you can make Header for world document?

Q5/ A-how you can add page border in world? **10 marks**

B- Copy the hall contains in an excel worksheet then add them in another one

Q6/ Choose **FIVE** only from the following and give there meaning? **10 marks**

Dir/w Dir/AA Type DEL Fdisk UNFORMAT C: Diskcopy A:

c

GOOD LUCK

جامعة ديالى
كلية الهندسة
قسم هندسة القدرة والمكائن

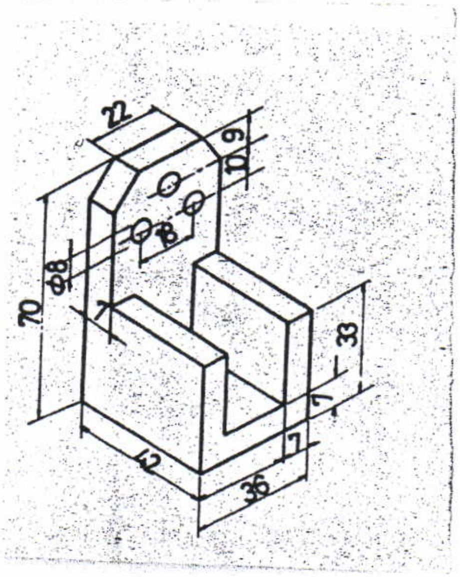
الامتحانات النهائية
٢٠١١-٢٠١٢
الدور الثاني

21

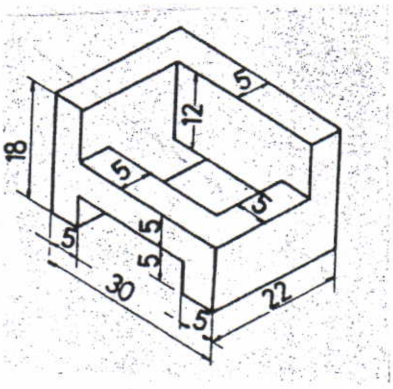
الموضوع /الرسم الهندسي
الزمن /ثلاث ساعات
٢٠١٢/٩/١٠

ملاحظة /الإجابة على كافة الأسئلة

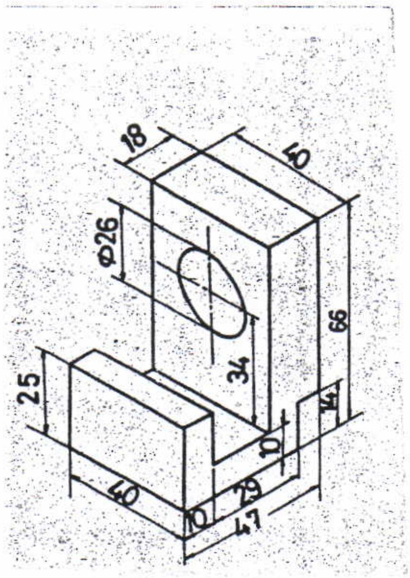
السؤال الأول:-ارسم المساقط الثلاثة للرسم أدناه مع رسم الأبعاد.



السؤال الثاني:-ارسم المقطع الجانبي للشكل أدناه



السؤال الثالث:-ارسم الشكل المجسم المبين أدناه مع الأبعاد.

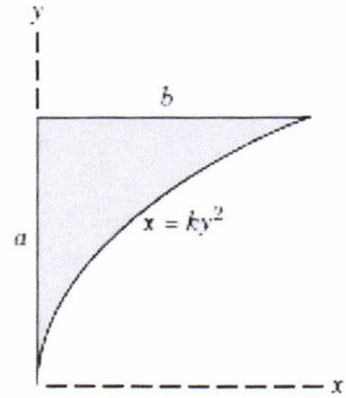


مع الأمنيات بالنجاح

مدرس المادة
م.م. خضر نجم عبد

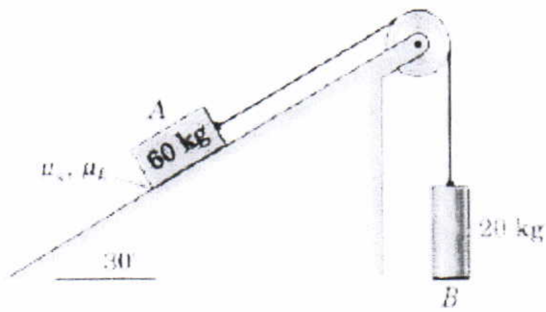
20 - 20

Q4: Determine the coordinates of the centroid of the shaded area.



---(20marks)

Q5: The system is released from rest, neglect the mass and friction of the pulley and calculate the acceleration of each body and the cable tension ***T*** upon release if ***a)*** $\mu_s = 0.25$, $\mu_k = 0.2$ and ***b)*** $\mu_s = 0.15$, $\mu_k = 0.1$.



---(20marks)

Q6: The acceleration of a particle is given by $a = 2t - 10$, ***a*** in meter per second and ***t*** in second. Determine the velocity and displacement as function of time. At ***t=0*** displacement ***x=-4 m*** and the velocity is ***3m/s.***

---(20marks)

Good luck

Examiner
Msc. Wisam Al Azawi

University of Diyala
College of Engineering
Power and Machines Dept.

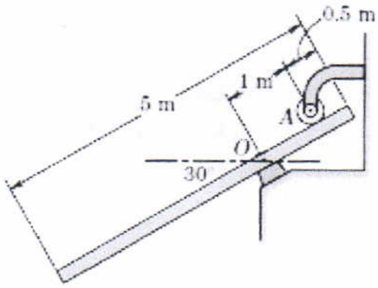
Final Exam
2011-2012
Second Attempt

Subject: Engineering Mechanics
Time : 3-Hours
Date : / / 2012

20

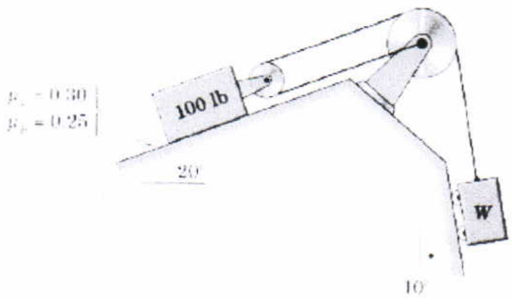
Note: Answer five questions

Q1: The uniform ***5-m*** bar with mass of ***100 kg*** is hinged at ***O***, and prevented from rotating by the roller at ***A***. Calculate the magnitude of the force supported by the pin at ***O***.



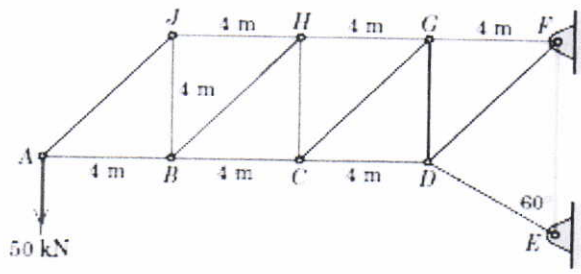
---(20marks)

Q2: Determine the range of weight ***W*** for which the ***100-Ib*** block is in equilibrium all pulleys are smooth.



---(20marks)

Q3: In truss structure shown in fig, calculate the forces in members ***GH*** and ***CG***.



---(20marks)

19

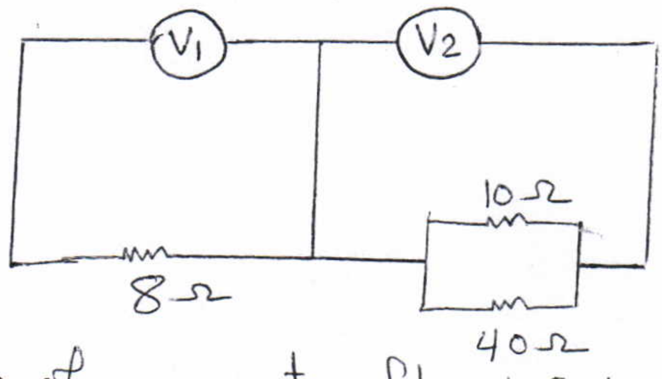
Final Exam - 2012
Second Term

Basic Eng. Lab.

Q1:- You have to replace a (1500 Ω) resistor in a radio you have no (1500 Ω) resistor but you have several (1000 Ω) once which you would connect:

a) three in parallel.
b) three in Series.
c) two in parallel.
d) two in parallel and one in Series.

Q2:-



For same value of current flowing in the circuit of Fig. above (choose one):-

a) $V_1 > V_2$ b) $V_1 = V_2$ c) $V_1 < V_2$

18-18

Q4 — **12.5%**

A- Design a combinational circuit that Converts a 4-bit Gray cod to a 4-bit Binary number. Implement the circuit with exclusive – OR gates.

ABCD	wxyz
0000	0000
0001	0001
0011	0010
0010	0011
0110	0100
0111	0101
0101	0110
0100	0111
1100	1000
1101	1001
1111	1010
1110	1011
1010	1100
1011	1101
1001	1110
1000	1111

B- implement the following Boolean function F, together with the don't care condition using no more than two NOR gates

$F(A,B,C,D)=\sum(2,4,6,10,12)$

$d(A,B,C,D)=\sum(0,8,9,13)$

Q5 — **12.5%**

A-An 8 X 1 multiplexer has input A,B, and C connected to the selection input S_2,S_1, and S_0 .respectively. The data input I_0 through I_7 are as follows :

$I_1 = I_2 = I_7 = 0$, $I_3 = I_5 = 1$, $I_0 = I_4 = D$, $I_6 = D'$

Determine the Boolean function that the multiplexer implements.

B- Design a T flip-flop by using

(a) J – k flip-flop , (b) D flip flop

And write its characteristic Table.

With best wishes

Dr. Nisren khamas

18

University of Diyala
College of Engineering
Dep. Of pow & ele mach..
Final Exam/2st Attempt

Class: 1st year
Subject: logic
Year: 2011-2012
Time: 3 hour

Note:-Answer four questions only

Q1	**A-Express the complement of the following function in sum of minterms.** **(a) $f(A,B,C,D) = \sum(3,5,9,11,15)$** **(b) $F(X,Y,Z) = \Pi(2,4,5,7)$** **B- Convert the following expression into sum of product and product of sum** **$(AB+C)(B+C'D)$**	12.5%
Q2	**A-Draw a NAND logic diagram that implements the complement of the following function.** **$F(A,B,C,D) = \sum(0,1,2,3,4,8,9,12)$** **B- Simplify the Boolean function below by using five - variable map .** **$F(A,B,C,D,E) = \sum(0,1,4,5,16,17,21,25,29)$**	12.5%
Q3	**A- A combinational circuit Is defined by the following three Boolean functions** $F_1 = x(y+y')z = x'y'z'$ $F_2 = xy'z' + x'y + x'y(z+z')$ $F_3 = x'y'z + xy(z+z')$ **Design the circuit with the a decoder and external gates** **B- Design a 4-input priority encoder with input D_o D_1 D_2 D_3, but with input D_o having the highest priority and input D_3 the lowest priority .**	12.5%

17

University of Diyala
College of Engineering
Dep. Of pow,Elec. & Comm.
Final Exam/2nd Attempt

Class:1st stage
Subject: Physics
Year: 2012-2013
Time:3 hour

Note:-Answer four questions only

Q1	The threshold wavelength for photoelectric emission in tungsten is 2.300A° .what wavelength of light must be used in order for electrons with a maximum energy of 1.5 eV to be ejected.	**25%**
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.	**25%**
Q3	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.	**25%**
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. B: explain the following: (1- covalent bonding , 2- the ionic bonding, 3-lyman series, 4-balmer series).	**25%**
Q5	A rod of n-type germanium 6mm long, 0.05mm radius has an electrical resistance 120Ω .if $n_i=2.5*10^{13}cm^{-3}$ assume of the mobility $\mu_n=3900\ cm^2/v.sec$,$\mu_p=1900cm^2/v.sec$.what proportion of the conductivity.	**25%**

Constants : $\epsilon=11.9$,$\epsilon_o=8.8*10^{-14}$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, $R=1.097*10^7\ m^{-1}$.

Good Luck

Head of Dep.: …………….

Name: …………………...

Lecturer:………….

Name:..Farhan.A.Mohammed

16

University of Daiyala	Final Year Exam	Subject: Mathematics
College of Engineering	2011 – 2012	Time : 3 hours
Department of Electrical	Second Attempt	Class : 1st year
And Power Machines		Date : / / 2012

Q1: A) Let $f(x) = 5x^2 + 1$, $g(x) = x^2 - 2x$, find each of the following :

1- $(g \circ f)(x)$ 2- $(f \circ g)(x)$

B) Find $\frac{dy}{dx}$ for : 1- $y = \frac{(e^{2x} + e^{-2x})}{(e^{2x} + e^{+2x})}$ 2- $y = \sin(x^2) - x^2 e^{x^2}$

Q2: A) Prove that : cosh (x – y) = cosh x cosh y – sinh x sinhy

B) Find the magnitude of the matrix : $A = \begin{bmatrix} 2 & 3 & -4 \\ 1 & 2 & 3 \\ 3 & -1 & -1 \end{bmatrix}$

Q3: A) Solve the system ,

$$2x_1 + x_2 - x_3 = 4$$
$$x_1 - 2x_2 + x_3 = -10$$
$$-3x_1 - 2x_3 = 9$$

B) Find the angle between the vectors : A = 3i + 2j - 4k & B = -i + 3j

---

Q4: A) Graf the function $y = \frac{x}{1 + x^2}$

B) Find A.B , A×B , \A\ , \B\ : $\vec{A} = 4i - 3j + 2k$, $\vec{B} = -2i + j - 5k$

Q5: A) Find the area of the region bounded on the line y = x + 3 and the parabola $x = y^2$

B) If $z_1 = 1 + i$ & $z_2 = 3 - i$, sketch two complex numbers and find :
$z_1 + z_2$, $z_1 . z_2$, z_1 / z_2

Q6 : Find : 1- $\int \tan x \, dx$ 2- $\int_2^3 (x^{-3} + 4 - x^{-1}) \, dx$

3- $\int \cos^2 x \, dx$ 4- $\int_0^{\pi} (1 + 9 - \sin x) \cos x \, dx$

With my best wishes

15 - 15 - 15

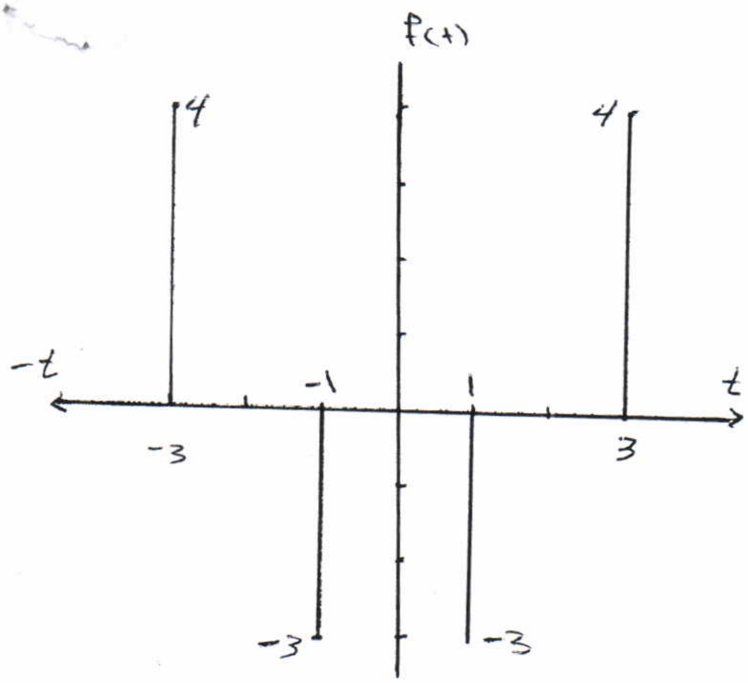


Fig. - 1 -

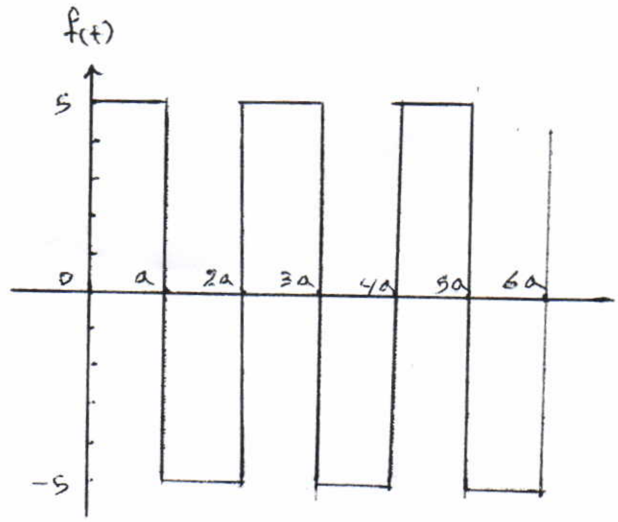


Fig. - 2 -

15-15

Q4	**Solve the following partial differential equation:** $3\frac{\partial u}{\partial x} + 2\frac{\partial u}{\partial y} = 0$, **u(x, 0) =4**e^{-x}	**12.5%**
Q5	**Apply the Laplace transforms to solve the following partial differential equation:** $\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$, **u(x,0)= 3sin 2**π **, u(0,t)=0 , u(1,0) =0 , where 0**$\leq$ **x** $\leq$**1 , u is bounded .**	**12.5%**
Q6	**Show that** $\int_x^1 p_n(x)dx = \frac{1}{2n+1}[p_{n-1}(x) - p_{n+1}(x)]$	**12.5%**
Q7	**Obtain the root of** $x^3 + x - 1 = 0$ **by fixed point method given that the root lies near 1 .**	**12.5%**
Q8	**Solve the following differential equation by using improved Euler's method.** $\frac{dy}{dx} = x^2 + y$ **for x=0.02 by taking h=0.01 , given that y = 1 at x =0**	**12.5%**
Q9	**Evaluate** $\int_0^{2\pi} \frac{d\theta}{5+3\sin\theta}$	**12.5%**
Q10	**Show that** $\int_0^{2\pi} \frac{\cos 3\theta}{5-4\cos\theta} d\theta = \frac{\pi}{12}$	**12.5%**

15

University of Diyala College of Engineering Dep. Of pow & ele mach.. Final Exam/2[st] Attempt		Class:3ed stage Subject: engineering analyses Year: 2011-2012 Time:3 hour

Note:-Answer eight questions only

Q1	**A-Find the Fourier transform of the spectrum represented in figure (1).** **B-Obtain the Fourier transform of the single sided exponential pulse e^{-at}u (t).**	12.5%
Q2	**A-Find the Z transform by residue theorem for** **F (t) =**$e^{at}\ \cos wt$. **B- by using power series method evaluate** $z^{-1}\left[\frac{z^2}{z^2+3z+2}\right]$ **C- Determine** $z^{-1}\left[\frac{(1-e^{-a})z}{(z-1)(z-e^{-a})}\right]$	12.5%
Q3	**A-find the Laplace –transform of the rectangular wave shown in figure (2).** **B-Determine the ∫ f(t) such that** $f(t)=0 \quad 0\leq t\leq 1$ $=0.5 \quad 1\leq t\leq 2$ $=1 \quad 2\leq t\leq 3$ $=0.5 \quad 3\leq t\leq 4$	12.5%

Diyala University
Collage of engineering

power engineering department .

Final Exam.

Second attempt
2011-2012
Examiner: Msc.Samir D . Ali

14

subject:Mechanics II

class :2nd -year
time: 3 hours

Note:- attempt all questions

Q1): Explain with sketches the following :

1.perefect inter cooler

2.regenerating

3.reheating

(15 marks)

Q2: The air supplied to a gas turbine power plant is (10 Kg/sec) that pressure ratio is (6) and the pressure at the inlet of the compressor is (1)bar, the inlet temperature is (300)°K and the maximum temperature limited by (1000°K) if γ=1.4 and $cp_a = cp_g$ =1 KJ/Kg °C, the compression and expansion are isentropic . neglect the mass of fuel find the power capacity of the plant in (Kw) and the thermal efficiency of the plant ?

(30 marks)

Q3) :A Rankin cycle steam power plant works between 40 bar, 400 °C at the boiler exit and 0.035 bar at the condenser calculate the efficiency assume isentropic expansion ignore the energy term at the feed pump.

(30 marks)

C

Q4): An electric current is passed through a wire of (2mm) in diameter and (20cm) long the wire is submerged in liquid water at atmospheric pressure and the current is increased until the water boils for this situation (h=5000w/m2.c) and the water temperature will be (100°c) how much electric power must be supplied to the wire to maintain the wire surface at (124°c).

(25 marks)

سمير داود علي

Good luck

Diyala University / College of Engineering
Dep. of Power Eng. & Electrical Machines
Subject / D.C Machines& Transformer
Examiner/ Dr. Mohammed Khalaf

13

Class / second year
Time / 3 hours
Data / / / 2012

Final Exam. / 2011-2012
Answer Five Equations Only

Q1 / A four-pole wave –connected armature has (51 slots) with (12 conductors) per slot and is driven at (900 rev./min.). If the useful flux per pole is (25 m web.), Calculate the value of the generated e.m.f. Allow (0.5 V) per brush for contact drop. (20M)

Q2 / In a long-shunt compound generator, the terminal voltage is (230 V) when generator delivers (150 A). Given resistance are (92 Ω , 0.015 Ω, 0.03 Ω and 0.032 Ω) respectively. Determine:(*i*) induced e.m.f. (*ii*) total power generated. (*iii*) distribution of this power. (20M)

Q3 / A series motor having a resistance of (1 Ω) between its terminals drive a fan for which torque is proportional to the square of the speed. At (230 V), it runs at (300 r.p.m) and takes (10 A). The speed of the fun is to be raised to (375 r.p.m) by increasing the voltage (Assume that the magnetic circuit of the motor is unsaturated). Find the voltage and the current required. (20M)

Q4 / Calculate the value of the a resistance steps or sections for the starter of a (220 V) d.c shunt motor. The maximum current and the minimum current are to be limited to (250 A) and (130A). The armature resistance of the motor is (0.1 Ω). (20M)

Q5 / A 15 KVA, 2300/2300 V transformer was tested to by open- circuit and closed- circuit tests. The following data was obtained:

V_{oc} = 2300 V	V_{sc} = 47 V
I_{oc} = 0.21 A	I_{sc} = 6 A
P_{oc} = 50 W	P_{sc} = 160 W

1- Find the equivalent circuit of this transformer referred to the high voltage side.
2- Calculate the full load voltage regulation at 0.8 lagging power factor. (20M)

Q6/ A 120 KVA , 6000/400 V, Y/Y 3-Ph, 50 Hz transformer has an iron loss of (1.6 KW). The maximum efficiency occurs at ¾ full load, copper loss at ¾ full load equals iron loss. Find the efficiency of the transformer at (*i*) full load and 0.8 power factor. (*ii*) half load and unity power factor. (*iii*) the maximum efficiency. (20M)

Good Luck

Fig. (1).

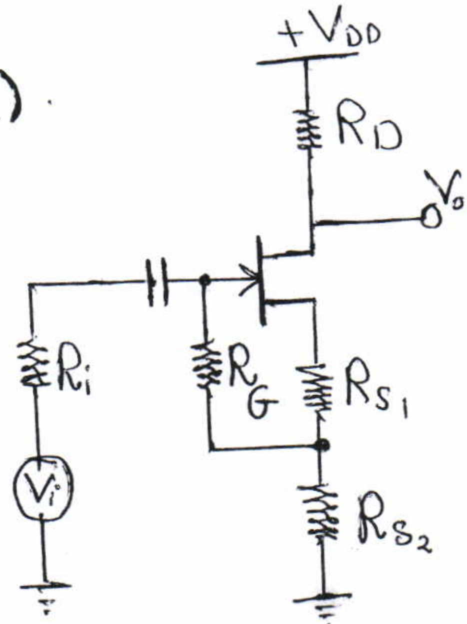


Fig. (2).

12-12

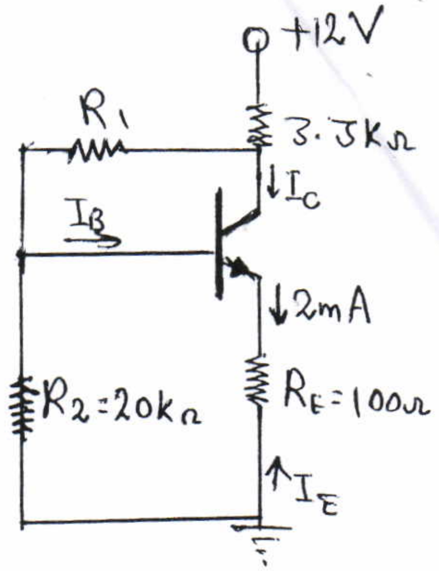


Fig. (3).

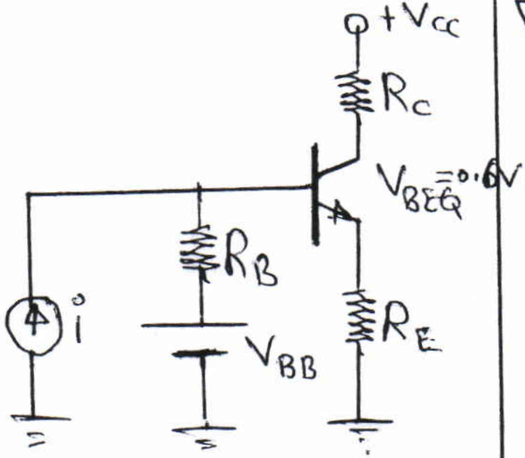


Fig. (4).

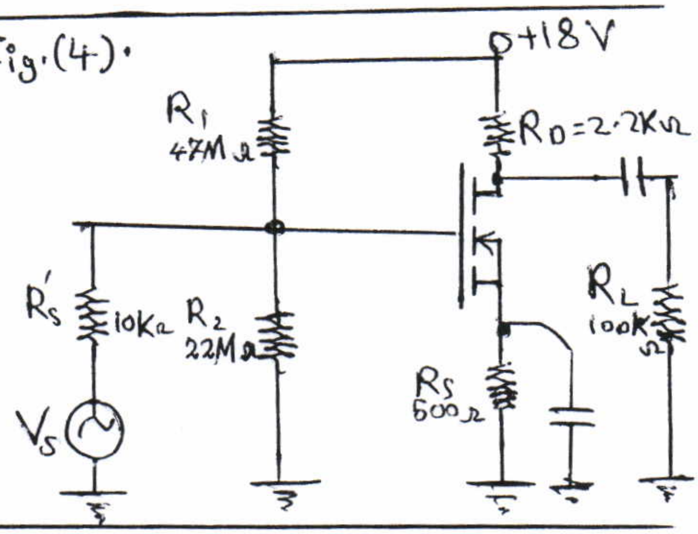


Fig. (5)

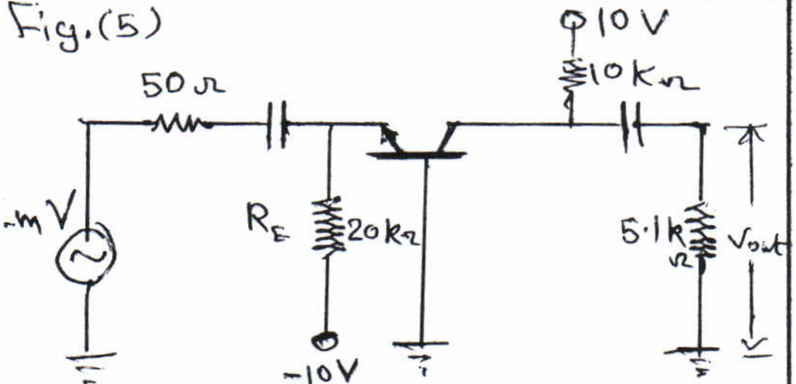


Fig. (6)

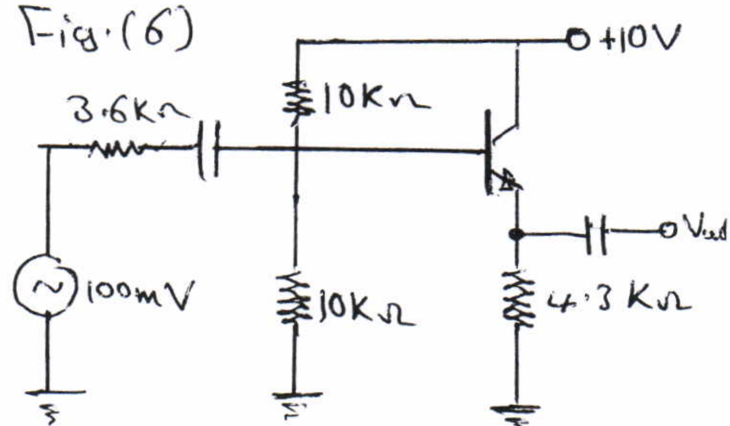


Fig. (7).

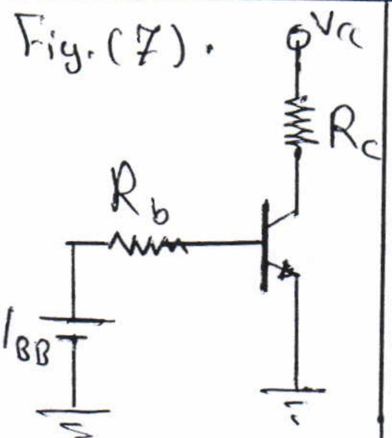


Fig. (8).

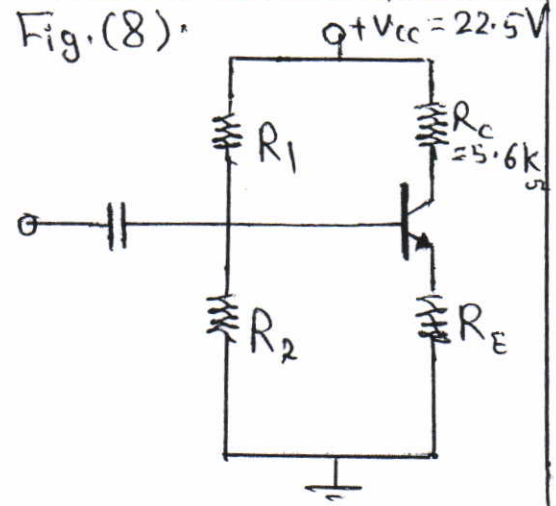
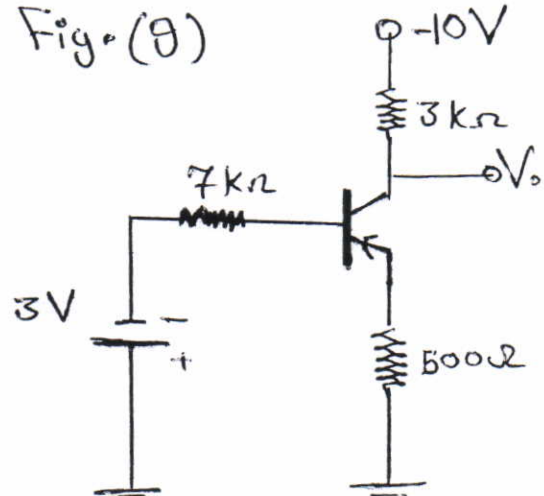


Fig. (9)



/ 12

College Of Engineering — **Final Examination** — **2011-2012**

Electrical Power engineering and machines — **Date: 16/9/2012**

Second year of power engineering — **Subject: Electronics**

((NOTE :ANSWER FIVE QUESTIONS ONLY))

Q1-A-Design a C.S. Amp, to give a voltage gain of (20V) and (I/P) impedance of (100kΩ). If available(FET) have (μ=30),(r_d=5 kΩ),(I_{DSS}=5mAmp.),(V_p=-4V).cct. value are(V_{DD}=20),(R_i=0.1 kΩ) .

B-Find equations for A_{VT}, A_V, Z_i, Z_o?, in Fig. (1).

Q2-A-1-An N-channel depletion –type MOSFET has I_{DSS} =18mAmp.,and V_p=-5V. Assuming that it is operated in the pinch –off region , find I_D when V_{GS} =-3V, and again when V_{GS}=2.5V.

2-Repeat (1) if the MOSFET is P-channel and V_P=5V

B-If α=0.98 and V_{BE} =0.7V , find R_1 in the circuit shown in Fig.(2).,for an emitter current I_E=-2mAmp. Neglect the reverse saturation current.

Q3-A-The Si transistor in the circuit shown in Fig.(3),has (50≤ β≤200). If V_{BB} =3V ,R_E=0.2 kΩ R_B =10 kΩ,then find the variation in the Q-point.

B-The MOSFET shown in Fig.(4). ,has the following parameters :V_{Th} =2V , β=0.5x10^{-3} , r_d =75 kΩ .It is biased at I_D=1.9mAmp.

i-Verify that the MOSFET is biased in its active region.

ii-Find the input resistance.

iii-Draw the small –signal equivalent cct. ,and find the voltage gain V_L/V_S.

Q4-A-Determine V_{out} for the circuit in Fig. (5).

B-Comparison between the field effect transistor and the bipolar junction transistor.

Q5-A-In Fig. (6).,V_S=100mV_{rms} and input impedance (3.6 kΩ) ,if β=100,find the V_{out} (ac) .

B-1-Find R_c and R_b in the circuit of Fig.(7)., if V_{CC} =10V , and V_{BE} =5V ,so that I_C =10mAmp. and V_{CE}=5V.A silicon transistor with β=100,V_{BE}=0.7V, and negligible reverse saturation current is under consideration .

2-Repeat part(1) if a(100Ω) emitter resistor is added to the circuit.

Q6-A- the silicon transistor with β=50, V_{BE} =0.6V is used in the cct .Shown in Fig.(8). It is desired that the Q-point be at (12V, 1.5mAmp.),stability factor S should be less than or equal to (3), (S≤3). Find R_E,$R_1$and R_2.

B–For the cct. Shown in figure (9) , given that.β =h_{FE}=100.

i- Find if the silicon transistor is in cutoff ,saturation ,or in the active region.

ii-Find V_o.

iii-Find the minimum value for the emitter resistor RE for which the transistor operates in the active region.

Examiner
HASSAN JASIM MOHAMMED

GOOG LUCK

11 - 11

	B- W.p. to find the following. ***(Use Matlab language)*** 1. $y=\int_0^1 \sqrt{1+\cos x}\, dx$ 2. Find the roots of the polynomial: $5x^5+4x^4-3x^3+2x^2+x+1=0$ 3. Solve y in term of x for the following equation: $2x-\ln y=1$ 4. The value of x and y from the following equations: $x^2-y=2$ and $y-2x=5$ 5. The solutions of the quadratic equations $x^2-2x-4=0$	
Q4	A- w.p. to find the analytical and numerical evaluation of the area under the curve defined by the function $y=x^2$ in the interval $0\le x\le 4$ using both trapezoidal command and quadrature command. ***(Use Matlab language)*** B- w.p. to find the number of even positive and odd negative for 50 number input? by using goto statement. **(use C++ language)**	**25%**
Q5	A- w.p to compute value of $y=\cos x$ if: ***(Use C++ language)*** $$\cos x = 1-\frac{x^2}{2!}+\frac{x^4}{4!}-\frac{x^6}{6!}+\frac{x^8}{8!}-\frac{x^{10}}{10!}.............$$ B - find, $\frac{dy}{dx}$ if $y=x^3+7x^2-5x+4$ Then plot the function and their derivative over the interval [1,5]. ***(Use Matlab language)***	**25%**

Good Luck

Head of Dep.: ……………. **Lecturer:……………...**

Name: …………………... **Name:…………………**

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

11

Class: 2st stage
Subject: programming by C++ and Matlab
Year: 2011-2012
Time: 3 hour

Four

Note:-Answer <u>for</u> questions only

Q1	A- w.p. to find the average value of rectifier voltage (V_{av}) where: Vp=16.26v, f=120Hz, R_L=22e3Ω, C=5e-6. $V_{av} = V_p\left(1 - \frac{1}{2fR_LC}\right)$ ***(Using C++ language).*** B- If $g(x,y) = x^2 + y^2$ find ***(Using Matlab language).*** (1) The value of g at the point (1, 2). (2)The value of g at the point (1, 3) and (2, 4).	**25%**
Q2	A- Find the function y defined through: $y = \begin{cases} x^2 + 4x + 4 & for \quad -2 \le x < -1 \\ 0.16x^2 - 0.48x & for \quad -1 < x < 1.5 \\ 0 & otherwise \end{cases}$. ***(Use C++ language)*** B- Write a script file to define a (3×3) matrix A with elements from 1 to 9 then find the requirements below depending on your entry from 1 to 4: ***(Use Matlab language)*** 1-The transpose of matrix A. 2-The determinate of matrix A. 3-The inverse of matrix A. 4-The sum of the main diagonal of matrix A.	**25%**
Q3	A- w.p. to compute and print the distance between two point (x1,y1) and (x2,y2) in Cartesian coordinates where: Distance $= \sqrt{(x1 - x2)^2 + (y1 - y2)^2}$. ***(use C++ language)***	**25%**

University of Daiyala
College of Engineerng
Department of Electrical
And Power Machines

Final Year Exam
2011 – 2012
Second Attempt

Subject: Electromagnetic Fields
Class : 2^{nd} year
Date : , ,

Q1:a) Express the field $D = (x^2 + y^2)^{-1}\ (x\mathbf{a}_x + y\mathbf{a}_y)$ in cylindrical components and cylindrical variables . *(10 MARKS)*

b) Describe the surfaces defined by the equation : *(10 MARKS)*

1- $r.\mathbf{a}_x = 2$, where $r = (x, y, z)$

2- $r \quad \mathbf{a}_x = 2$, where $r \quad \mathbf{a}_x = (0, z, -y)$

Q2: Volume charge density is located in free space as $\rho_v = 2\,e^{-1000r}$ nC/m^3 for $0 < r < 1$ mm , and $\rho_v = 0$ elsewhere. *(20 MARKS)*

a) Find the total charge enclosed by the spherical surface $r = 1$ mm .

b) By using Gauss's law, calculate the value of D_r on the surface $r = 1$ mm.

Q3: Let $E = 400\,\mathbf{a}_x - 300\,\mathbf{a}_y + 500\,\mathbf{a}_z$ in the neighborhood of point $P(6, 2, -3)$. Find the incremental work done in moving a 4-C charge a distance of 1 mm in the direction specified by : *(20 MARKS)*

a) $\mathbf{a}_x + \mathbf{a}_y + \mathbf{a}_z$

b) $-2\mathbf{a}_x + 3\mathbf{a}_y - \mathbf{a}_z$

Q4) Given the current density $J = -10^4\,[\text{Sin}(2x)\,e^{-2y}\mathbf{a}_x + \text{Cos}(2x)\,e^{-2y}\mathbf{a}_y]$ kA/m^2 *(20 MARKS)*

a) Find the total current crossing the plane $y = 1$ in the $\mathbf{a}_y$ direction in the region $0 < x < 1 , 0 < z < 2$.

b) Find the total current leaving the region $0 < x , x > 1 , 2 < z < 3$ by integrating J.dS over the surface of the cube.

Q5: Find the current in the circular wire , if the current density is $J = 15(1 - e^{-1000r})\mathbf{a}_z$ A/m^2 . The radius of the wire is 2mm . *(10 MARKS)*

b) Given $J = 10^3 \sin\theta\, \mathbf{a}_r$ A/m^2 in spherical coordinates, find the current crossing the spherical shell $r = 0.02$ m. *(10 MARKS)*

Q6: A total charge of (40/3) nC is uniformly distributed around a circular ring of radius 2m . Find the potential at a point on the axis 5m from the plane of the ring. Compare with the result where all the charge is at the origin in the form of a point charge . *(20 MARKS)*

WITH MY BEST WISHES
M. Q. AL-BASSAM

9 – 9

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.

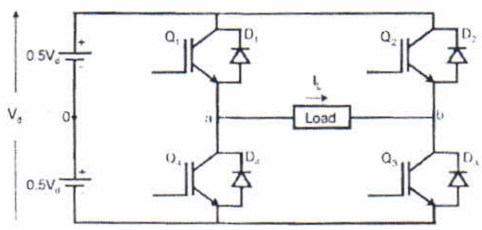
c) average and peak currents of each transistor.

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
College of Engineering
Department of Electrical power
Department of Electronic

Final Exam.2
2011 – 2012
3^{rd},4^{th} stages

Subject: Power Electronics
Time:3 hours
Date: sept. , , 2012

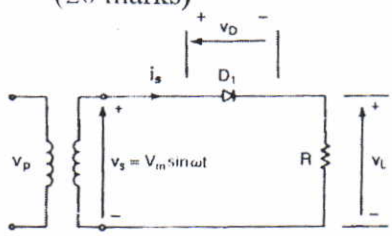
9

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)

بسم الله الرحمن الرحيم

UNIVERSITY OF DIAYLA

COLLEGE OF ENGINEERING / POWER & MACHINE ELECTRICAL ENG.

HIGH VOLTAGE ENGINEERING /3RD STAGE /EXAMINER: L .T. ALBAHRANI

RESET EXAMINATION 2012/ **Answer 4 questions: Time 3 hours**

Q1) In the circuit shown in Figure 1 observed high voltage generation circuit. Determine

1- The output voltage V(o).
2- The current flow in the resistor and capacitor.
3- The efficiency of the circuit.

NOTE: - ideal diodes- neglect voltage drop

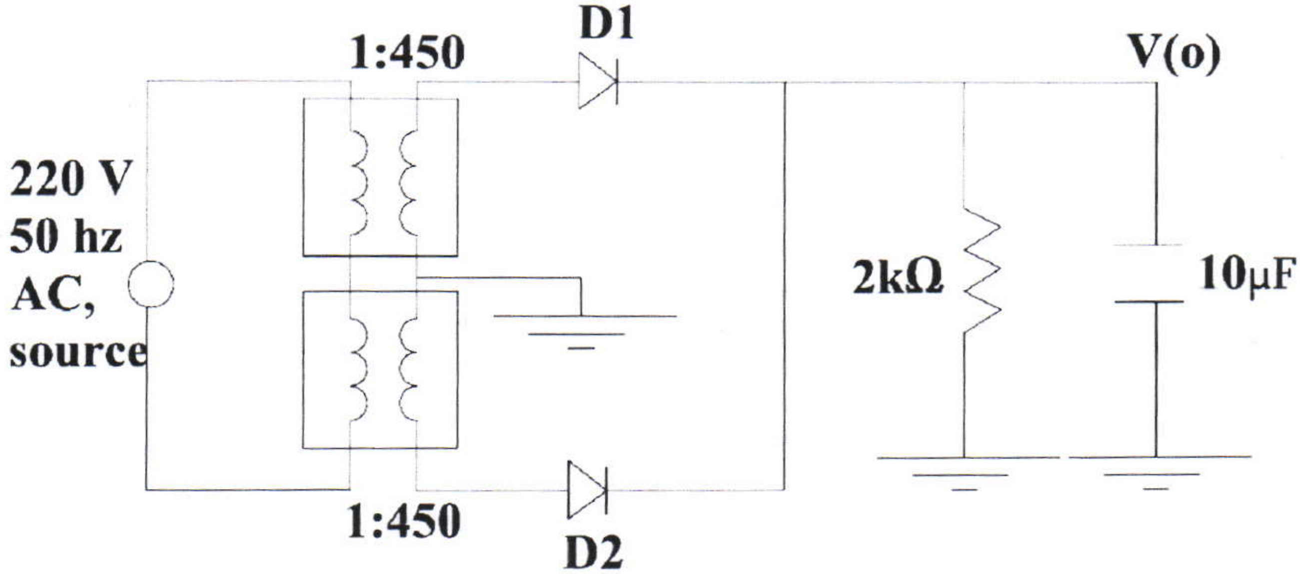


Figure 1 high voltage generation circuit

Q2) For an electronegative gas show that the townsend criterion for breakdown is given by:

$$\gamma \frac{\alpha}{\alpha - \eta} [e^{(\alpha - \eta)d} - 1] = 1$$

Prove from the first principles and state conditions to obtain

$$\alpha = \frac{\eta}{1 + \gamma}$$

Q3) A steady current of 580 μA flow through the parallel plane electrodes when d=0.5 cm and 9.5 kV is applied. The gap distance is doubled and the electric field (and hence the townsend's first ionization coefficient) is kept the same. By ignoring the secondary ionization process and assuming that the external current injected at the cathode is 25 μA. find the values of the following:-

8 - 8

1- Townsend's first ionization coefficient.
2- The applied voltage
3- The current

Q4) In the circuit shown in the Figure 2. Observed low effeciency circuit . Derive from the first principles the output voltage.

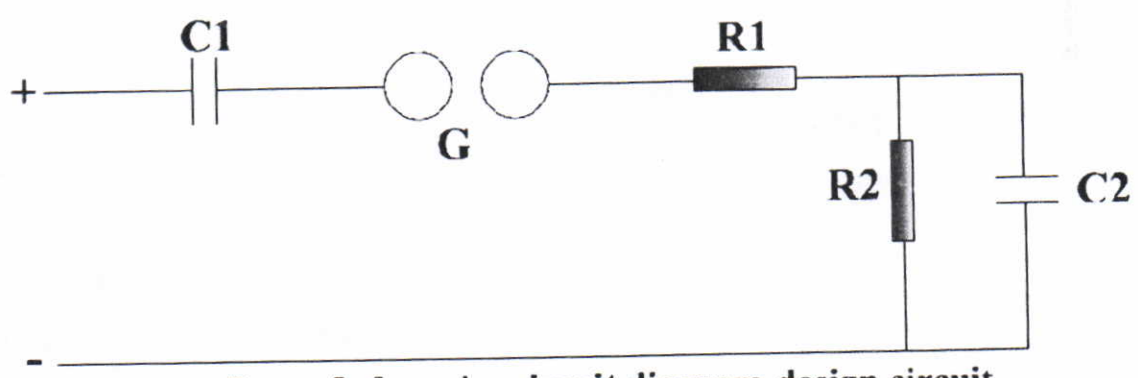


figure 2- Impulse circuit diagram–design circuit

Q5) Correct the under line following questions.

1- Insulators must be often survive reliably under <u>high electrical stress for long periods of time.</u>
2- Sparkover is breakdown in material <u>between electrodes in a gas or solid material.</u>
3- The main purpose for study high voltage engineering is <u>transmitted electrical energy in high voltages to reduce losses.</u>
4- It is measured the output voltage by high voltage COCKROFT-WALTEN multipler DC circuit 4 stage is <u>792 kV</u>, where input voltage to the circuit is 99 kV , rms, AC source.
5- <u>Rise time</u> is the time taken by impulse reach to 10% of the peak value.
6- At constant temperature in a uniform field the sparking potential of gas material depends only <u>upon applied voltage and type of gas</u>.
7- If an overhead line has a surge impedance of 400Ω, <u>the surge impedance loading is 100MW</u> when the transmission line voltage is 132 kV.

University of Daiyala
College of Engineering
Department of Electrical
And Power machines

Final Year Exam
2011-2012
second Attempt

Subject: Measurement
Class: 3 rd
Date: 5\9\2012

Answer all question 8

Q4

(A) Explain the Cathode Ray Tube (CRT)

(B) Explain the Vertical and Horizontal Deflection System

(C) Explain the Curve Fitting and Approximation by Least Square Approximations Method

(D)Explain the Transducers classified according to their application, method of energy conversion, nature of output signal.

Q5

(A) Defied all items

1-Oscilloscope 2-Transducers 3-- Delay Line 4-Errors 5-Force summing devices

(B) Draw and Explain Hay's bridge for coils with large phase angle

Note all the questions have same mark (20 marks).

Good luck

A.M. AL-AZZAWI

University of Daiyala
College of Engineering
Department of Electrical
And Power machines

Final Year Exam
2011-2012
second Attempt

Subject: Measurement
Class: 3 rd
Date: 5\9\2012

7

Answer all question

س١ اجب عن احد الفرعين

(ا) اذكر فوائد النظام العالمي للوحدات (SI).

(ب) قارن بين نظام الوحدات العالمي (SI) ونضام الوحدات (قدم .باوند.ثانية - FPS).

(ج) قارن بين نظام الوحدات العالمي (SI) ونضام الوحدات (سم.غ.ثا- CGS).

س٢ اجب عن احد الفرعين

(أ)عبر عن الكميات الكهربائية بالصيغة الابعادية.

١ -القوة ٦-المقاومة
٢-الشغل ٧-الفيض المغناطيسي
٣-الشحنة ٨-القوة المغناطيسية
٤-التيار ٩-المتسعة
٥-فرق الجهد ١٠-المحاثة

(ب) - استحصل الوحدات القياسية للكميات التلية :

١-النفاذية المطلقة (μ_0)

٢-المجاوزية المطلقة(ε_0)

٣-حاصل ضربهما ($\mu_0\varepsilon_0$) بطريقة التحقق الابعادي

(ج)- برهن صحة المعادلة التالية بطريقة التحقق بالصيغة الابعادية

$$L=CP/Q[QS+rS+rQ]$$

حيث ان (L) محاثة , (c)متسعة , (r,S,P,Q) مقاومات

س٣ (أ) ماذا يدث لو ناصفنا او ضاعفنا القدرة التالية (P_1/ p_2)=١٠٠٠.

(ب) مضخم له من الكسب مقدار ٦٠ ديسيبل. اذا كانت مقاومة الدخل تساوي ٧٥ اوم ومطلعه يغذي حمل متلائم معه بالمقاومة التي تساوي ١٤٠ اوم . اوجد تيار الحمل عند تسليط فولتية دخل= ١٠٠ مايكوفولت .

(ج)اشرح بالتفصيل وحدة القياس نيبر(Neper). وما هي العلاقة بين وحدة الديسبل ووحدة النيبر .

(د) وضح معامل التصحيح للاحمال التي لاتساوي (٦٠٠) اوم. ومعامل تصحيحات المدارج الاخرى.

c
:(

Q5/ Determine the range of K for stability to system having the closed loop transfer function shown below ? (10marks)

$$\frac{C(S)}{R(S)} = \frac{K}{S(S^2+S+1)(S+2)+K}$$

Q6/For the system shown in fig-3- design a lead compensator such that the dominate closed –loop poles are located at S=- 1 ± j1 ? (10marks)

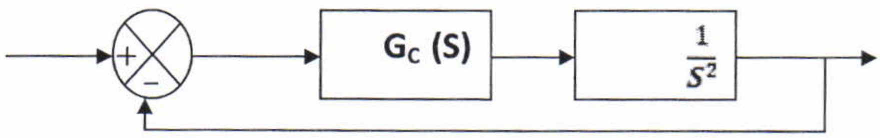


Fig-3-

Q7/Sketch the root –locus plot of the system shown in fig-4- and locate the closed –loop poles, and draw the response for a unit step input ? (10marks)

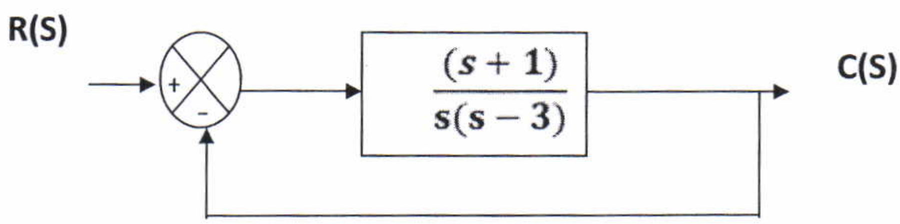


Fig-4-

مع تمنياتي بالنجاح

المرحلة الثالثة قسم هندسة القدرة والمكائن الكهربائية

مادة : السيطرة امتحان الدور الثاني لسنة 2011-2012

مدرس المادة د .نسرين خماس سبع

Answer six questions only:

6

Q1/A/ Define three only :

Processes, systems , disturbance ,feedback ,delay time.

Q1/B/make a comparison between closed-loop systems and open loop systems.(10marks)

Q2/Design a circuit that can be used as a lag or lead network; with sign inverter? (10marks)

Q3/Obtain the transfer function of the mechanical system shown in fig -1-

And draw its equivalent electrical circuit ? (10marks)

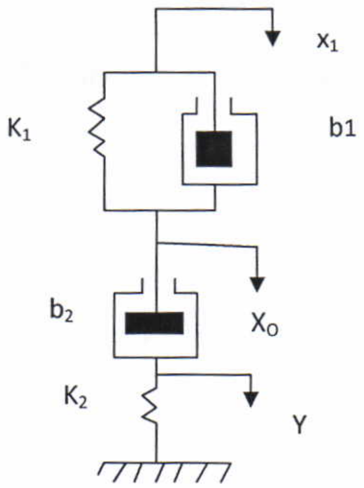


Fig-1-

Q4/Obtain the transfer function Y(S)/X(S) of the system shown in fig-2- ? (10marks)

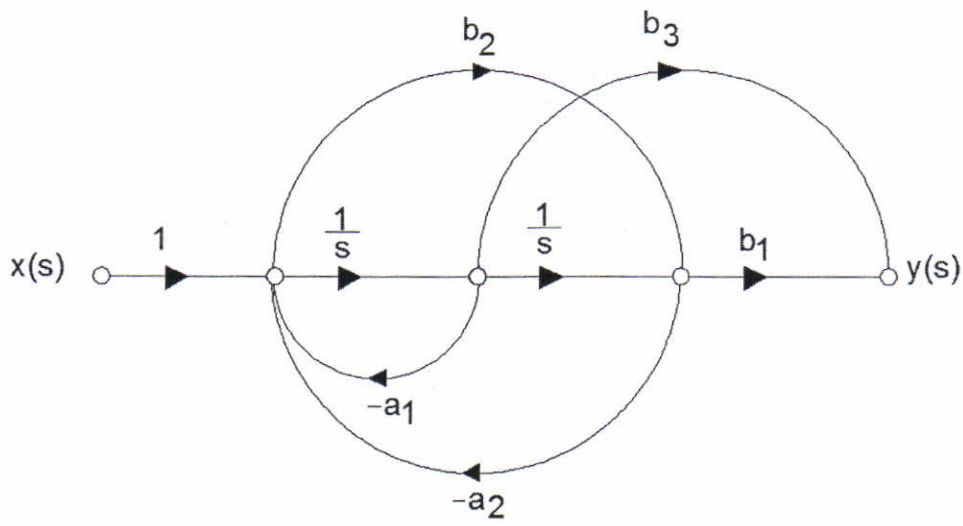


Fig-2-

يتبع

5-5

Q5: A) What are applications of synchronous motor? Explain briefly. (6 Marks)

B) A 2200-V, 3 phase, star connected synchronous motor has a resistance of 0.6 Ω and a synchronous reactance of 6 Ω. Find the generated e.m.f. and the angular retardation of the motor when the input is 200 kW at: (6 Marks)

a) Power factor unity **b)** Power factor 0.8 leading.

Q6: A 3 phase, star connected synchronous motor takes 48 kW at 693 V, the power factor being 0.7 lagging. The induced e.m.f. is increased by 25%, the power taken remaining the same. Find the armature current and the power factor. The machine has a synchronous reactance of 2 Ω per phase and negligible resistance. (12 Marks)

13/5/2012

Ghassan

Good Luck

M.Sc.: Gh. A. Salman

University of Diyala.
College of Engineering.
Electrical Power and Machines Department.

Final Year Exam.
2011-2012
Second Attempt

Subject: A.C. Machiness I
3^{rd} Year Class
Time: 3 Hours
Date: / /2012

5

Note: Answer Five Questions.

Q1: A) What are methods for speed control of induction motors on rotor side? Explain with sketch two of these methods. (6 Marks)

B) The star connected rotor of an induction motor has a standstill impedance of (0.4 + j4) ohm per phase and the rheostat impedance per phase is (6+j2) ohm. The motor has an induced e.m.f. of 80 V between slip rings at standstill when connected to its normal supply voltage. Find rotor current: (6 Marks)

a) At standstill with the rheostat in the circuit.

b) When the slip rings are short circuited and the motor is running with a slip of 3%.

Q2: An induction motor is running at 75% of the synchronous speed with a useful output of 41.5 kW and the mechanical losses total 1.5 kW and the stator losses total 3.5 kW. Estimate: (12 Marks)

a) The rotor Cu loss.

b) Power input to the rotor.

c) The line current.

d) The efficiency is the motor working

Q3: A) What are the conditions must be satisfied for synchronization of alternators? How that indicates these conditions are satisfied? (6 Marks)

B) A 3 phase, star connected alternator has an open circuit line voltage of 6600 V. The armature resistance and synchronous reactance are 0.6 Ω and 6 Ω per phase respectively. Find the terminal voltage and voltage regulation if load current is 160 A at 0.9 leading. (6 Marks)

Q4: A 1MVA, 11kV, 3 phase, star connected alternator has following O.C.C. test data:

Field current (A):	50	110	140	180
Line voltage (kV):	7	12.5	13.75	15

The short circuit test yielded full load current at a field current of 40 A. The armature resistance is 0.6 Ω per phase. Find the regulation at half full load at 0.8 lagging by using synchronous impedance method. (12 Marks)

Q5) In the system shown in the figure -5-. 132 kV bus bar has connected to it some local generation, a 132kV grid interconnection with fault level of 2000 MVA and 132kV feeders which supply a static load and dynamic loads through step down transformer. The each feeders has rated of 50 MVA and reactance of j0.1 p.u. By using **bus impedence matrix method**,use 100 MVA base on the generator side. Determine:

U – U-4 – 4

1- The fault level at bus bar A, B and C.
2- The current distribution in the network due to the fault (during fault) ,when 3 ph short cct occur at bus bar C.
3- Voltage at buses A, B and C (during fault).
4- State any assumption mode.

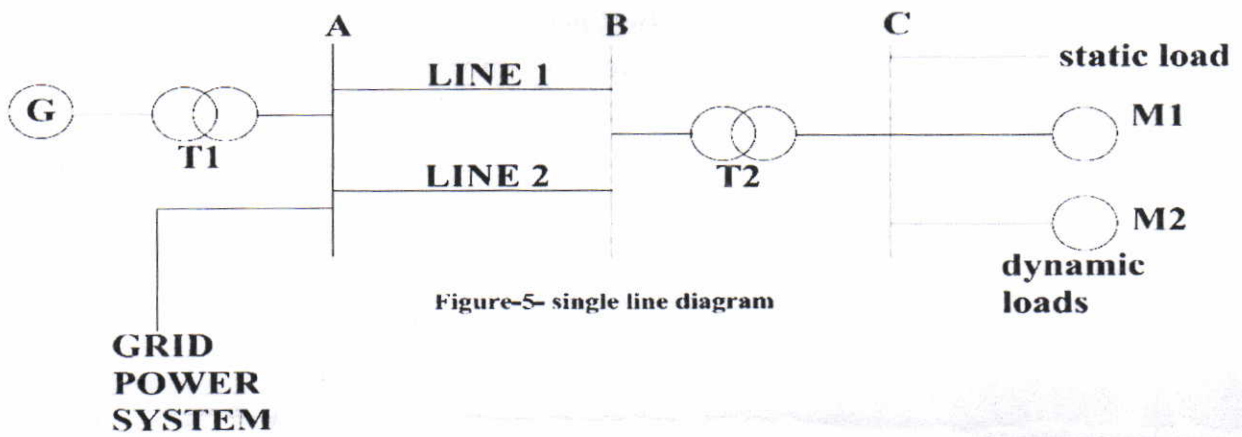


Figure-5- single line diagram

System data are given:-

G: 100 MVA, 11kV, X"=J10%
T1: 100 MVA, 11/132 kV, X"=J10%
T2: 100 MVA, 132/11 kV, X"=J10%
LINE1: 50MVA, X"=J10%
LINE2: 50MVA, X"=J10%
MOTOR 1: 25 MVA, X"=J20%
MOTOR 2: 25 MVA, X"=J20%
GRID POWER SYSTEM: MVAF=2000
STATIC LOAD: 57 MVA, 10 kV, power factor=0.6 lag.

Recommendation and Instructions

1- **Read all questions carefully and then answer**
2- **Check the numbers before use the personal calculator.**
3- **Use pencil to write and not use pen.**
4- **Depend the clear line when you write**
5- **Use three characters after integer number . example : 1.234**
6- **Finally , Good luck with best hap.**

end paper

Q4) The ratings of the components of the three phases system represented by single line diagram are shown in figure 3-, where base MVA is 50, base voltage is 22 kV on the generator side. Calculate the value of (X) required putting the current in the three phases symmetrical short circuit at point F is 3000 A. System data are given:-

G1: 30 MVA,	20kV,	X"=J3%
G2: 30 MVA,	20kV,	X"=J3%
G3: 30 MVA,	20kV,	X"=J3%
T1: 20 MVA,	20/33 kV,	X"=J6%
T2: 20 MVA,	20/33 kV,	X"=J6%
T3: 20 MVA,	20/33 kV,	X"=J6%
T4: 20 MVA,	33/132 kV,	X"=J10%
T5: 20 MVA,	132/11 kV,	X"=J10%
LINE:		X=J29Ω

4-4-4

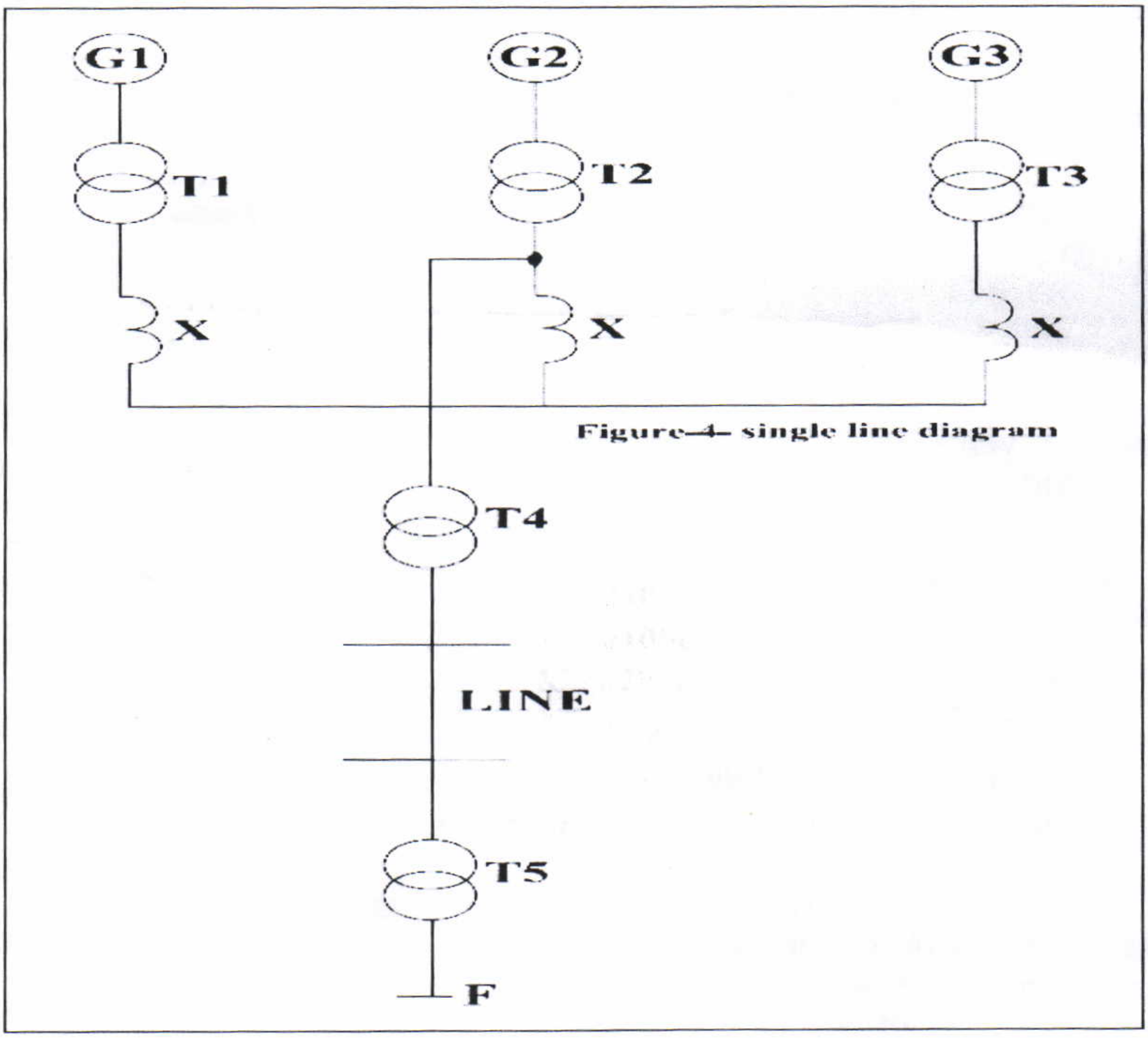


Figure-4- single line diagram

Q2) Figure -2- shown simple power system network. By using **one iteration GAUSS SEIDEL METHOD** to determine :-

1- Matrix admittance form.
2- P.U Line voltage on bus No.2 , bus No.3 and bus No.4
3- P.U active and reactive power flow from G1.

4_4

Where System data are given:-

Bus 1 - G1: Reference bus – V1=1.05 , δ1=0
Bus 2 – load bus bar : P2=0.5 pu unity power factor
Bus 3 - generator bus : V3=1.02p.u
Bus 4 – load bus bar : P4= 0.5 p.u, Q4= 0.1 p.u lag power factor
Z12= j0.5 p.u, Z23= j1.0 p.u, Z34=j1.0 p.u, Z41= j0.5 p.u
All data at the 100MVA base and initial value 1with zero angle.

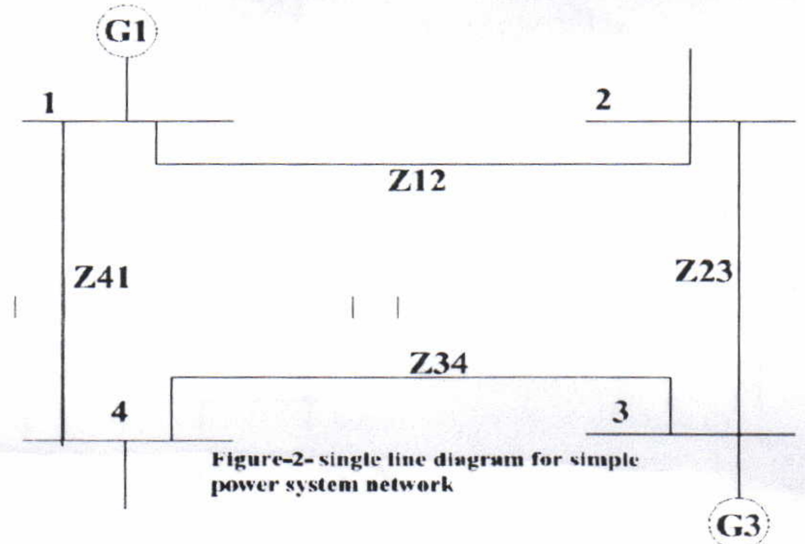


Figure-2- single line diagram for simple power system network

Q3) In the system shown in figure 3. Three phase synchronous generator operate at 1500 r.p.m **counter clockwise**. When fault occur (single line to ground) on phase **a**. Answer the following questions.

1- Derive from the first principles fault current.
2- Phase voltages during fault.

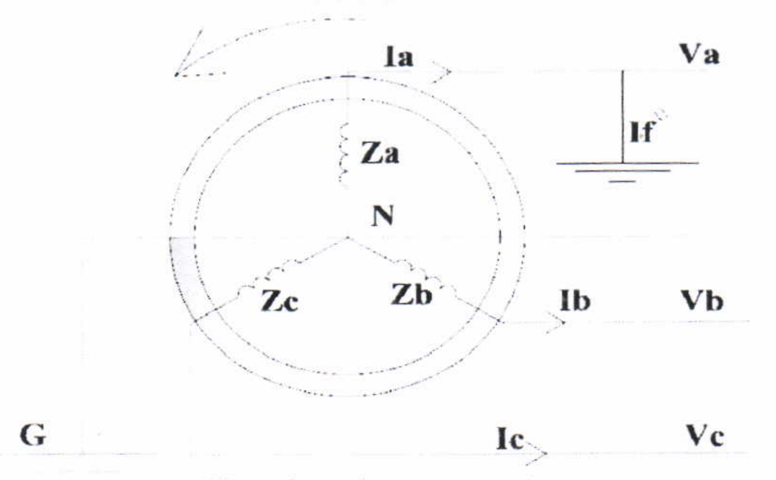


Figure-3- synchronous generator diagram

بسم الله الرحمن الرحيم

4

UNIVERSITY OF DIAYLA

COLLEGE OF ENGINEERING / POWER & MACHINE ELECTRICAL ENG.

POWER SYSTEM ANALYSIS /4TH STAGE /EXAMINER: L .T. ALBAHRANI

RESET EXAMINATION 2012 TIME: 3 HOURS

Choose only four from the following questions under condition, Q1 must be found with the questions choice.

Q1) Figure -1- shown part of electrical power network, where the loads were supplied from (south Baghdad) thermal power plant with four units each 250 MVA and (north Baghdad) gas power plant with two units each 125 MVA through transmission lines and group of step down transformers. **Answer the following questions.**

1- Draw an impedance diagram for the network.
2- Determine the P.U current flow in the loads.

Note: all calculations must be with MVA base 100, base voltage 15kV on the generation side.

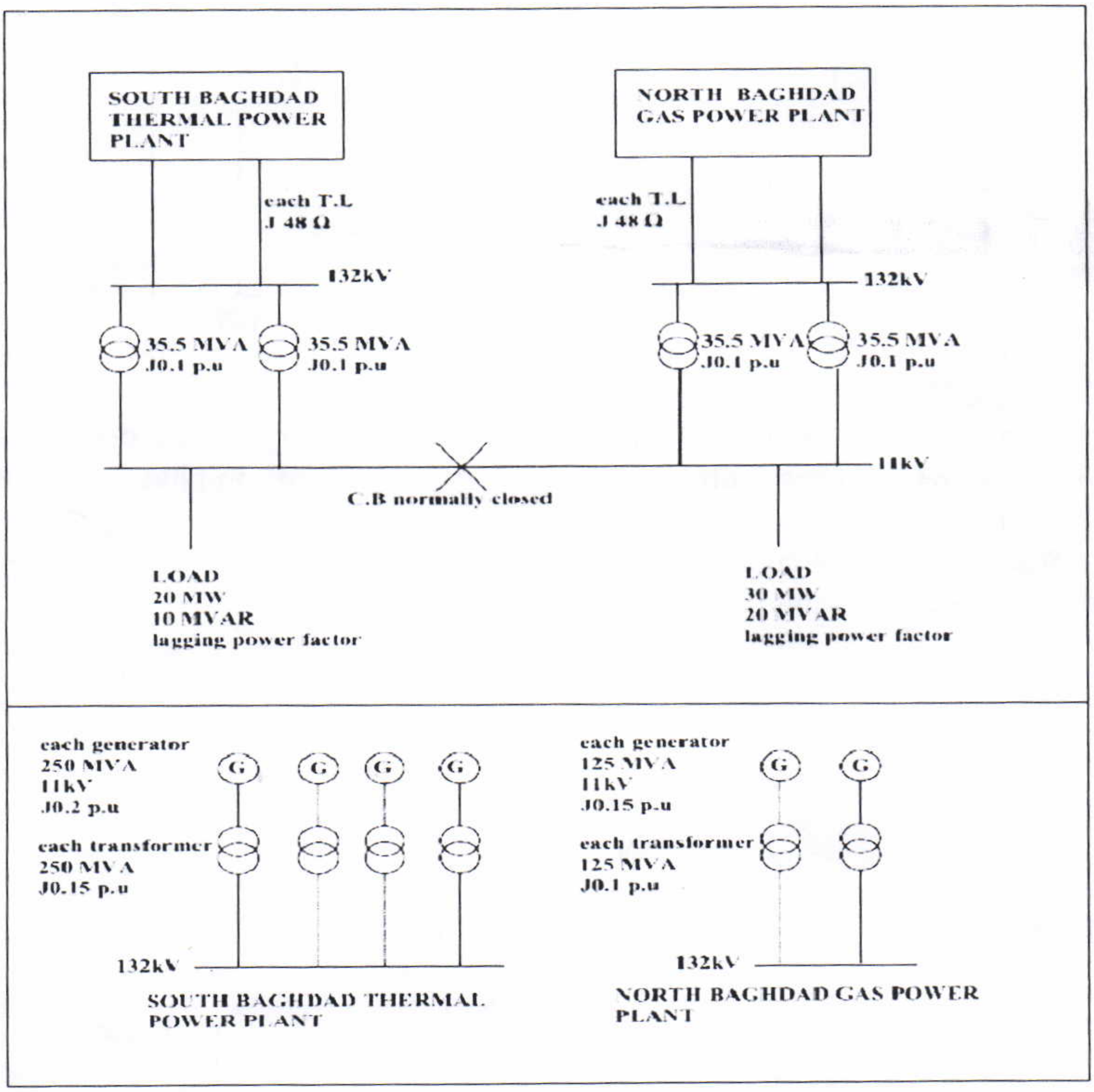


Figure 1.single line diagram for electrical power network

3-3

Q.3:A.Fusing current depends upon :

B.An 11.8Kv Busbar is fed from three synchronous generators having the following ratings and reactances 2o MVA X o.8 p.u 6oMVA X o.1 p.u , 2o MVA X o.o9 p.u . Calculate the fault current and MVA .If athree phase symmetrical fault occurs on the Bus bars ,resistance may be neglected . the voltage base will be taken as 11.8Kv and the VA base as 6oMVA .

(15 marks)

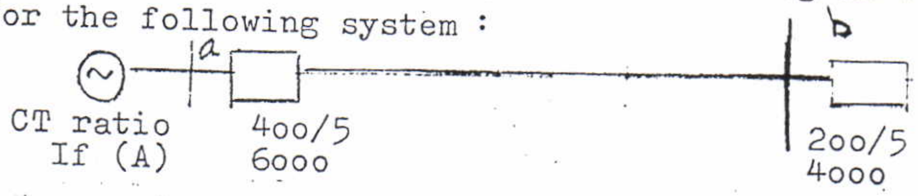
Q.4:A.In which purpose the Buchhlos relay is provided ,Explain it is operation .

B.A star connected 3-phase 1oMVA 6.6 Kv alternator has a per-phase reactance of 1o% it is protected by Merz Price circulating current principle which is set to operate for fault currents not less than 175A .Calculate the value of earthing resistance to be provided in order to ensure that only 1o% of the alternator winding remains unprotected ?

(15 marks)

Q5.A. How many types of structure used in induction relay ,Explain the pole shaded with drawing and vector diagram ?

B.For the following system :



It required to provide time current grading .Suggest proper relay setting and TMS ?

PSM	1	1.5	2	3	4	5	6	7	8	9	1o	2o
Time sec	∞	25	1o	6.2	4.9	4.3	3.7	3.5	3.3	2.9	2.8	2.2

(15 marks)

with best wishes

Examiner

Mohammed Al sumaidaie

University of Daiyala
College of Engineering
Department of .. Power

Final Year Exam
2010 -2011
First Attempt

Subject: Protection
Time: 3 hours
Date: June, 4, 2011
4th class
3

Note: Answer . Four. questions.

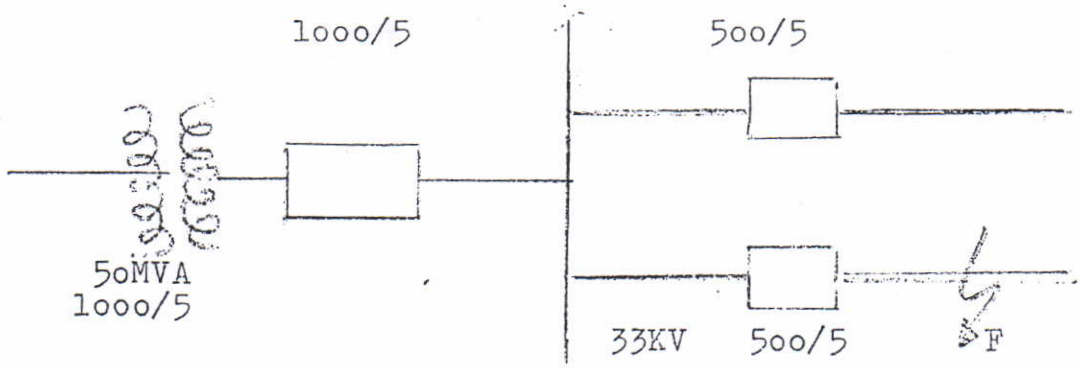
Q.1: A. numirise the faults which may ocuure on an alternator ,Explain one of them ?

B. A3o -MVA (Y - Δ) ,132/33 KV solidly earthed / delta -connected transformer protected by circulating current equipment, is supplied on the 33KVside .If the H.V C.T has a primary current rating of 15oA, calculate the necessary C.T ratio for use with relay rated at 1A, If an earth fault of 1oooA occure on one line terminal of 132 KV winding (within the protected zone). Determine the currents in each part of each pilot wire and in the relays coils ,assuming no in-feed from the 123 KV system.

(15 marks)

Q.2: A. Which kind of protection which used in case of stator winding fault for an alternator .

B. The 5o MVA Transformer shown in fig. below:



may be called upon to operate at 25% over load .the transformer C.B is equiped with 1ooo/5 C.T,s ,the feeder C.B with 5oo/5 C.T , the feeder relays are set at 125% and a TMS =o.4 ,use the time PSM characteristics given below ,and a discrimination Margin of o.5 sec. for athree phase fault current of 4oooA at F ,Find

a) the operating time of the feeder relay

b)the minimum setting of the transformer relay ,and

c)the TMS of the transformer relay

Time sec.	2.2	2.5	2.8	3.5	4	5	8	1o
PSM	2o	15	1o	6.4	5	4	3.2	2.5

(15 marks)

2-2

Q5/ Select the suitable cable size for 3-phase,380volt, three induction motors have following ratings(50, 40, 25) kW, the distance between the motors and the supply is 40m, efficiency (0.9), and the p.f. is (0.85) ,(voltage drop must not be exceed 5%). (use the tables)

Q 6/ Find the number, location and mounting height of 40 W fluorescent tube of 60 lm/W, that required to illuminate a laboratory of the following specifications :Dimensions(30×12) m with a height of 5m , required illumination 190 *lux*, working plane is 0.8m above the floor, the fitting are fixed at 0.4 below the ceiling , UF = 0.7, and the location is clean and has a good maintenance (use twin tube on each fitting). *(10 Marks)*

Table (1) Oil – immersed power distribution transformer (11 / 0.4) kV.

Rated Power	Losses (W)		Fuse Size (Amp.)	
kVA	**No** Load	**On** Load	**H**.V. Side	**L**.V. Side
315	780	3850	40	500
400	9300	4600	40	630
500	1100	5500	63	800
630	1300	6500	63	1000

Table (2) Stranded copper conductor , in ducts , PVC oversheathed cables.

Area of Conductor	Two Core		Three and Four Core	
mm^2	**Current Rating** Amp.	**Voltage Drop** mv /amp /m	**Current Rating** Amp.	**Voltage Drop** mv / amp /m
50	180	0.94	150	0.82
70	220	0.66	185	0.57
95	265	0.49	225	0.42
120	300	0.4	255	0.35
150	340	0.34	285	0.29

Good Luck & All The Beast

University of Diyala	**Final Year Exam**	**Subject : Distribution & Design**
College of Engineering	**2011- 2012**	**4th Stage**
Dept. of Power & Electrical Machines	**Second Attempt**	**Time : 3 hours**
		Examiner : Hatim Gh. Abood
		2
((Answer All Questions))		

Q1/ Answer the following : *(10 Marks)*

A- State the types of distribution system configurations (with draw) .

B- State the types of distribution in large buildings (with draw).

Q2 / Answer the following: *(10 Marks)*

A- State the control method for the amount of power factor correction capacitor.

B- Find the size of the capacitor bank that required to improve the p.f. from 0.8 to 0.9 , and find the reduction in transformer losses after the correction for a system of 500 KW and a transformer 630 kVA .

Q 3/ for the system shown in Fig.(1) , select the suitable transformers and calculate the **total** annual losses.(use the tables) *(10 Marks)*

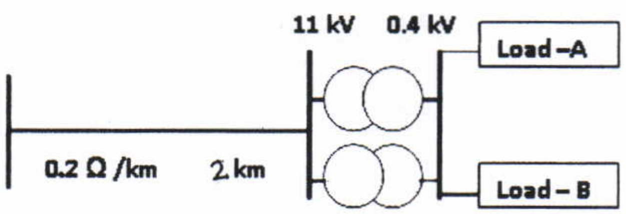
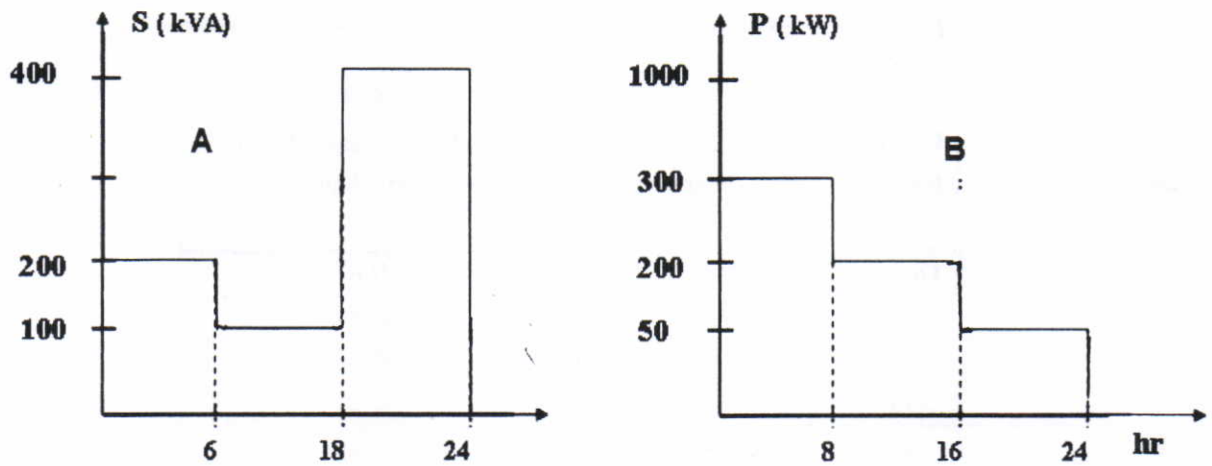


Fig. (1)



Q4 / Answer **two** only from the following: *(10 Marks)*

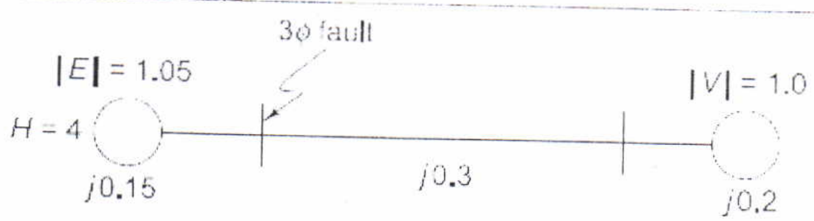
A- Draw the diagram of main and emergency generator for smaller size case.

B- State the advantages of the neutral grounding system.

C- Draw the configuration of version -3 of (132 /33 /11) kV substation (with details).

1-1

Attached Figures and Notes

Q1	 $P_G = P_L =$ 1000MW R= 0. 015 rad per sec/MW $P_G = P_L =$ 10000MW R= 0. 0015 rad per sec/MW Fig. (1)
Q4	 FIG (2)

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K.E = H = M·Ws

University of Diyala
College of Engineering
Dept. of Electrical Power &Mach.
Final Exam/2^{nd} Attempt

Class: 4^{th} stage
Subject: Power Sys. OP&Ctrl.
Year: 2012-2013
Time: 3 hours

1

Note:-Answer All Questions.

Q1 — 25%

Attempt A *OR* B

A: Two power stations A and B operate in parallel. They are inter-connected by a short transmission line. The station capacities are 100MW and 200MW respectively. The generators at A and B have speed regulation R= 3% and 2% respectively. Calculate the output of each station and the load on the interconnector if:
(a) The load on each station is 125MW,
(b) The loads on respective bus bars are 60MW and 190MW and
(c) The load is 150MW at the station A bus bar only.

25

B: For the two area power system shown in figure(1), the load increased by 10MW in area A; determine (a) the change in frequency (b) change in tie line power flow (c) ACE in each area?

25

Q2 — 25%

Attempt A *OR* B

A: Consider two steam power plants operating with incremental production costs
$C_1 = (0.08P_1 + 16)$ \$/Mwhr
$C_2 = (0.08P_2 + 12)$ \$/Mwhr
Given the loss coefficients $B_{11} = 0.001$ per MW, $B_{22} = 0.0024$ per MW. Find the economic schedule of generation?

B: The following incremental costs pertain to a 2 plant system.
$C_1 = 0.03P_1 + 14$ \$/MWhr
$C_2 = 0.04P_2 + 10$ \$/MWhr

20

The loss coefficient are $B_{11} = 0.001$, $B_{22} = B_{12} = 0$. If λ for the system is 30 compute the required generation at the 2 plants and the loss in the system?

20.

Q3 — 25%

2

A synchronous motor is receiving 25% of the power that is capable of receiving from an infinite bus. If the load is doubled, determine the max. value of the load angle

Q4 — 25%

5

A synchronous generator is feeding 250 MW (P) to a large 50 Hz network over a double circuit transmission line. The maximum steady state power that can be transmitted over the line with both circuits in operation is 500 MW (P_{max}) and is 350 MW with any one of the circuits. If A three-phase fault occurring (as shown in fig. 2) at the network-end of one of the lines; calculate the critical clearing angle?

Good Luck & All the best

Head of Dep.: ……………

Name: Dr. Nisreen

يارب يارب رحمتك

Lecturer: ……………

Name: Dhrgham M.

28/08

$\frac{52}{100} \times \frac{5}{60}$

نادي عليا مظهر العجائب