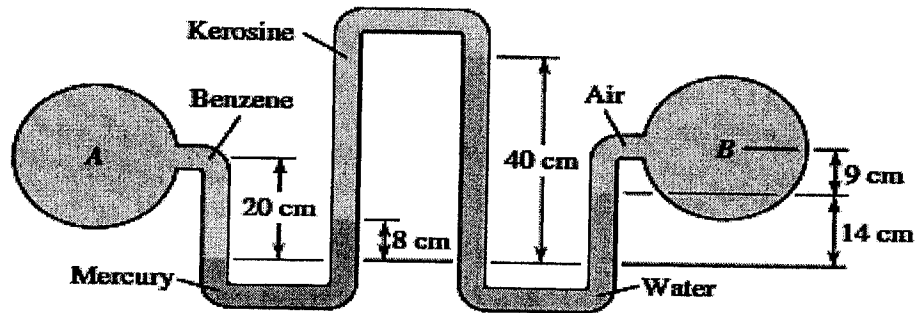


The examination consists of 4 questions in 2 pages . Maximum mark (90 marks) . Make any necessary assumptions . Answer the following questions .

Question (1)

(22 marks)

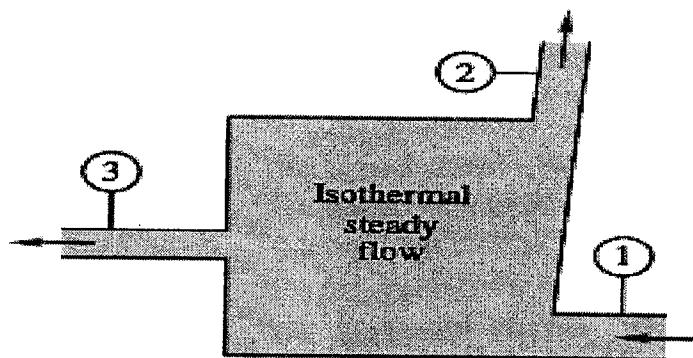
Determine the pressure difference (Pa) between points A and B . Note that the densities at 20 °C of Kerosine , Benzene , Mercury , Water and Air are : 804 kg/m³ , 881 kg/m³ , 13550 kg/m³ , 998 kg/m³ and 1.2 kg/m³ respectively .



Question (2)

(23 marks)

There is a steady isothermal flow of water at 20°C through the device shown in the figure . Heat-transfer , gravity , and temperature effects are negligible . Known data are $D_1 = 9 \text{ cm}$, $Q_1 = 200 \text{ m}^3/\text{h}$, $p_1 = 150 \text{ kPa}$, $D_2 = 7 \text{ cm}$, $Q_2 = 100 \text{ m}^3/\text{h}$, $p_2 = 225 \text{ kPa}$, $D_3 = 4 \text{ cm}$, and $p_3 = 250 \text{ kPa}$. Compute the rate of shaft work done for this device and its direction .



P.T.O.

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Question (3)

(a) What are the indications of poor compressed air preparation ? (8 marks)

(b) Parts are machined according to the following cylinder movement sequence :

A + , B + , B - , A -

Note that A and B are pneumatic-double acting cylinders . The sequence of operations should be performed automatically . Provide for single cycle operation : The pneumatic and the electro-pneumatic solution . (15 marks)

Question (4)

(a) What are the main importance characteristics of hydraulic fluid ?

(8 marks)



(b) Provide and explain in brief the performance of a hydraulic control circuit for lifting a load .

(14 marks)

Best Wishes

Prof. Mohamed Eltelbany

17/1/16
 كاتبة اتيق
 ابراهيم مبرك / 026

 كلية الهندسة	Dept/Division: Mechanical Eng. Academic Level: 2nd Year Production Semester: First 14/1/2016 Course Code & Title: GEN 5214 Occupational Safety Instructor: Dr. Ibrahim Mubarak Total Mark: 80	 كلية الهندسة
Time Allowed: 3 hrs		

Answer the following questions: Assume any missing & support your answer with suitable drawing

Problem (1) [20 Marks]:

A) Write short notes any 3 of the following topics: [7 Marks]

- 1- Light & Sources Ergonomics, 2- Natural Radiation Sources, 3- OHSAS Standard Simplified
 4- Noise and Vibration reduction methods, 5- Ergonomic Recommendation for Computer Work.

B) Match parts (A) and (B) relating to safety aspects: [7 Marks]

- | | |
|--|-----------------------------|
| (A) | (B) |
| 1. When something functions in a manner in which it was not intended. | (A) Failure |
| 2. An implied threat or danger of possible harm. | (B) System safety programme |
| 3. A systematic approach to ensure that hazards are identified, evaluated, and eliminated or controlled throughout the life cycle of the system. | (C) Hazard |

C) Draw the type of Safety Interface between Management and Individuals. [6 Marks]

Problem (2) [20 Marks]:

A) Define risk and it's elements ? [5 Marks]

B) Estimate Risk Assessment Matrix and show Flow Charts for 3 Moving Workers in Fig.(1):

(1) Industrial Robot , (2) Wheel Hand Truck , (3) Fork Lift [15 Marks]

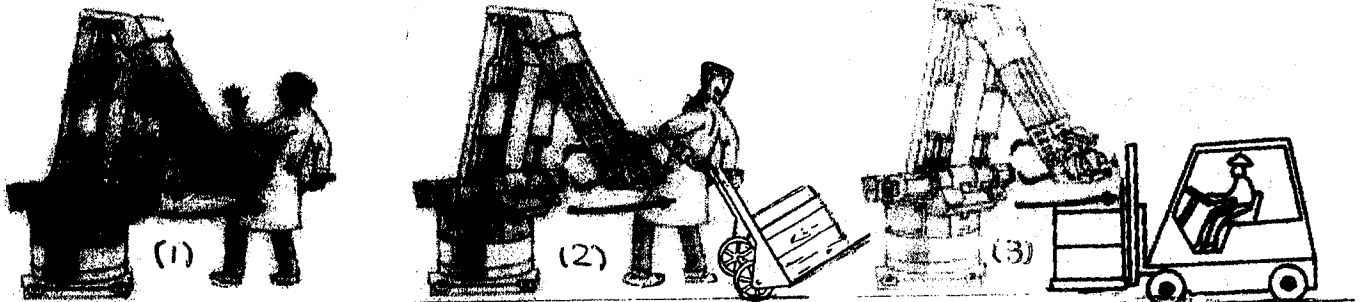


Fig.(1)

Table (1): Risk Assessment Matrix:

		Severity [S]				Probability [P]	
		Close Call	First Aid	Lost Time	Irreversible		
Frequency [F]		1	3	6	10		
Monthly	1	1	3	6	10	1	Unlikely
Weekly	2	4	12	24	40	2	Possible
Daily	4	16	48	96	160	4	Probable
Hourly	6	36	108	216	360	6	Certain

Table (2): Risk Rating Identified Matrix:

Risk Rating [Rr]	Risk Rating Identified	Rating	Rank
Minimal	Controls are in-place – Best practice stage	1 - 3 - 4	A
Limited	Ensuring that all safety precautions have been taken Implement administrative controls	6 - 8 - 10	B
Moderate	Immediate corrective	12 - 16 - 24 - 36 - 40 - 48	C
Heightened	Elevate to hazard	96 - 108 - 160 - 216 - 360	D

Plseas Turn Over

Problem (3) [15 Marks]:

Analyze plant Safety by using *Statistical Analysis Methods*.

The following data for TWO Industries Composite : *Construction & Building* and *Petroleum Extractive*, [England] from 1 January to 28 February 2015

Required	Quantity	Simplex	Data
A-1) Injury Frequency Rate (T), Morbid / Work Hours	222	m	Working-man Employees Plant No.
	20	a1	Total No. of Work Injuries
	3	a2	No. of Accidents Access Road from to Plant
	5	a3	First Aid Accident
2) Injury Severity Rate (M), [Used Table (3)]	8	b1	Work-day Hours No.
	9	b2	No. of Work-day Off
	6	b3	No. of Hours Overtime
	Calculate	e	Period Days Measurement
3) Report Discuss [Used Table (4)]	10	C1	No. of Days Disable safe
	7	C2	Health Days Complete
	6	C3	Convalescence Days
B) <u>Writ the Solution with Programming</u>	2 - 4 %	C4	Partial Disabilities
	3 %	C5	Permanents Disabilities

Table(3): Time charges for permanents & partial disabilities are Tabulated in International Labor:

3,000 Work Days [= 10 Years x 300 Year Life Days]	حالات عجز مؤقت Partial Disabilities
7,500 Work Days [= 25 Years x 300 Year Life Days]	حالات عجز مستديم Permanents Disabilities

Table (4): Guidelines of Industries Composite Injury Frequency Rate (T) by Bureau of Labor Statistics :

Industries Composite	(T)	الصناعات المؤلفة Industries Composite	(T)
Mining المناجم	19.0	Transportation & Public Utilities وسائل النقل والمواصلات - الخدمات العامة	29.0
Services Air Port الخدمات الميناء	21.5	Agriculture, Forestry, & Fishing أدوات الجراحة - سحب الأسلاك	30.0
Petroleum Extractive استخرجات بترولية	25.0	Manufacturing Production الصناعات التحويلية الإنتاجية	32.0
Finance & Wholesale أسواق جملة موال	25.5	Construction, Building, & Asphalt التشييد والبناء و الرصف للطرق	34.5

Problem (4) [25 Marks]:

(A) How do we hear? [5 Marks]

(B) A worker is exposed to a [Lp] 105 dB (A) constant noise source during a 8- hr shift. What is the noise exposure [T] (hr) ? [5 Marks]

(C) The Machine Tools lab. Volume: [22 m Length x 12 m Width x 8 m High] is designed to work with industrial illumination: [15 Marks]

1- Design for the illumination class: ceiling white, walls pointed light yellow and windows with white curtains. Take to Bulb lamps (100 watt) [used tables (5 & 6)].

2- Draw the Distribution Plan for the illumination lab.

Table (5):

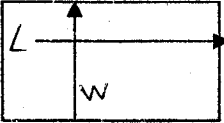
Ratio of Width W/h AND Length L/h	Bulb نوع: Light / Dark	Fluorescent: Light / Dark
	0.5	0.15 / 0.10
	1.5	0.25 / 0.16
	2.5	0.33 / 0.23
	4.0	0.41 / 0.30
	5.0	0.53 / 0.41
	8.0	0.57 / 0.54
		0.62 / 0.46

Table (6):

Illumination Rooms الأماكن المضاءة	Luminous Lux (E) شدة الإضاءة	Illumination Bulb W/m2	Illum. Fluorescent W/m2
Class room - Chemical Lab.	500 - 1000	22 - 28	28 - 33
Workshops - Testing Lab.	1000 - 2000	28 - 32	33 - 36
Kitchen - Living room	400 - 500	15 - 22	6 - 8
Halls - Pantry - Bed Room	200 - 300	6 - 12	3 - 4
Garage	100 - 200	4 - 6	1.5 - 2

1 W = 684 Lm



كلية الهندسة ببلوان

Dept/Division : Production Eng.

Academic level: Second

Semester: First 2015/2016

Course code & title : ELC 5212 / Electronic Engineering

Instructor: Dr/ Fathy Z. Amer & Dr. Essam

Total mark: 90 marks

Time allowed: 3 hrs



جامعة أسيوط

Instructions: Solve each part in separated papers

Answer the following questions

0 1 1 1 1 1

Question1

(Mark 25)

a.1. Add the BCD numbers 01110011+ 10101011, and add Df + CA

Convert to BCD numbers: 10010111000010000111

2. Convert each of the following: $(359.875)_{10} = (?)_8$, $(650.624)_{10} = (?)_{16}$

b. Sketch the output wave form for the circuit in Figs. 1

c. Convert SOP and POS into standard SOP and standard POS.

POS. a. $AB + \bar{A}BC + A\bar{C}\bar{D}$ b. $(A + \bar{C})(A + B)$

d. Implement the expression: $X = \overline{(A + B + C)} DE$ using NAND and NOR logics.

Question2

(Mark 20)

a. Use K-map to minimize the following expressions:

1. $(B + \bar{C} + D)(\bar{A} + B + C + \bar{D})(A + \bar{B} + \bar{C} + D)(\bar{A} + \bar{B} + C + D)(A + B + \bar{C} + \bar{D})$

2. $\bar{B}\bar{C}D + ABC\bar{D} + ABCD + \bar{A}BC\bar{D} + ABC + \bar{A}BC\bar{D} + ABCD + \bar{A}BC\bar{D} + \bar{A}BC\bar{D}$

b. 1. Determine the output waveform for the BCD-to-decimal decoder circuit in Fig. 2.

2. For the adder in Fig. 3, determine the sum and output carry of the adder circuit.

c. 1. Define the function of: multiplexer and demultiplexer.

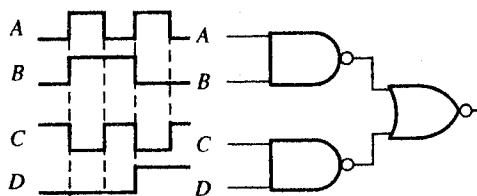


Fig. 1

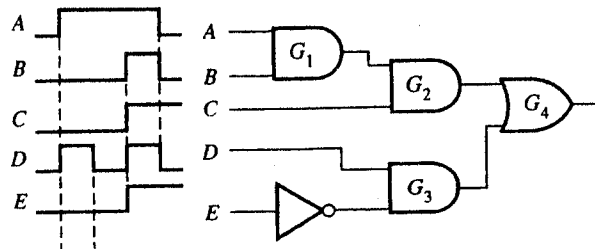
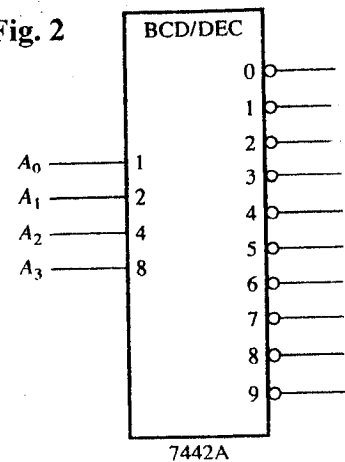
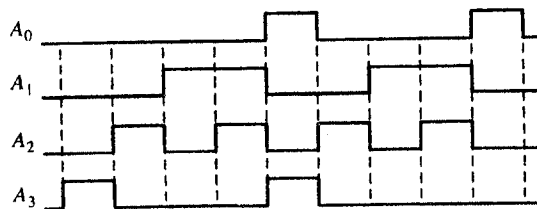


Fig. 2



P. T. O.

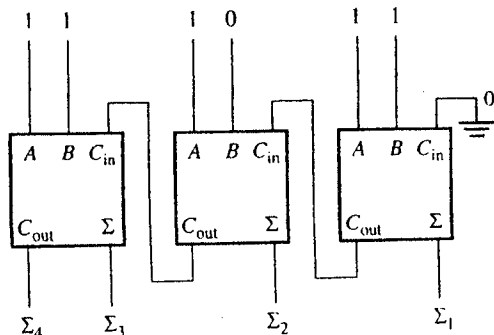


Fig. 3

Question 3

(Marks 24)

a) A sample of silicon is doped to the extent of 2×10^{14} acceptor atoms/cm³ and 3×10^{14} donor atoms/cm³. At the temperature of the sample the resistivity of pure (intrinsic) germanium is 50 Ω-cm. If the applied electric field intensity is 2V/cm, find the total conduction current density ($\mu_p = 1800 \text{ cm}^2/\text{V.s}$ and $\mu_n = 3800 \text{ cm}^2/\text{V.s}$ at 300°K). (8 Marks)

b) Determine the ripple factor for the filtered rectifier with a load as indicated in Figure -1. What minimum PIV rating must the diodes have? (8 Marks)

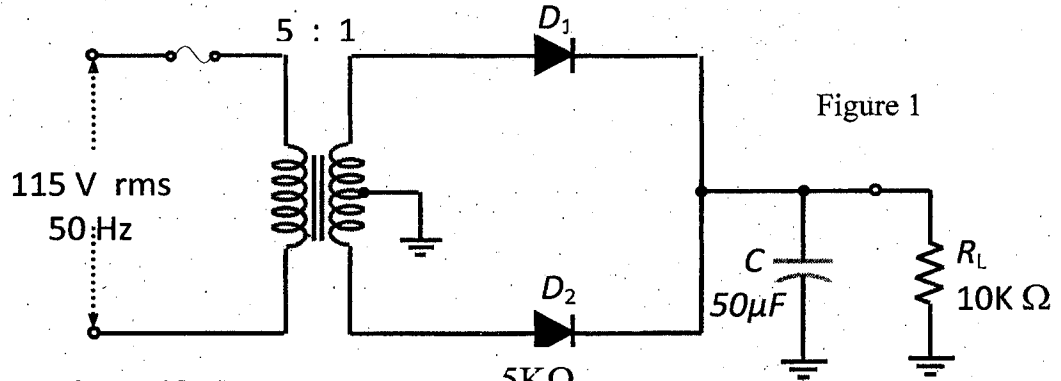


Figure 1

c) The diodes shown in Figure.3 are ideal. Sketch the transfer characteristics for $-20 \leq V_i \leq +20\text{V}$. Indicate the state of each diode (on or off) over each region of the characteristic. (8 Marks)

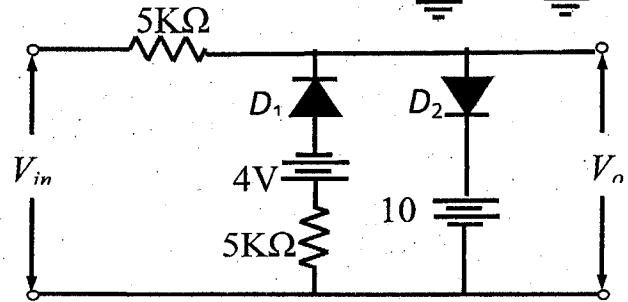


Figure 2

Question 4

(Marks 21)

a) For the voltage regulator shown in figure.3, assume that $V_Z = 30\text{V}$, $V_{in} = 150\text{V}$, $R = 600\Omega$, $r_Z = 0$, and $I_{ZK} = 10 \text{ mA}$, $I_{ZM} = 190 \text{ mA}$. Determine:

- (i) the variation in R_L over which the load voltage is still regulated at the zener voltage. (4 Marks)
- (ii) the maximum power dissipated in resistance R_L and in the zener diode ($P_{L(max)}$ and $P_{Z(max)}$) ? (2 Marks)

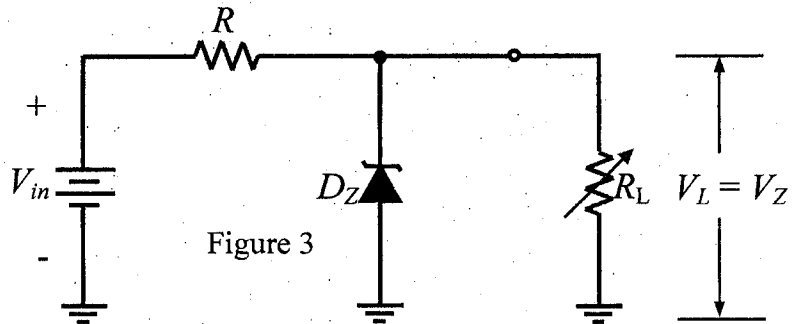


Figure 3

b) Define (i) The pinch-off voltage V_P , (2 Marks)

(ii) Cutoff voltage $V_{GS(off)}$, (2 Marks)

b) compare between common collector and common base configurations from the following points of view: A_V , A_I , Z_{in} , Z_{out} , and applications. (3 Marks)

c) For the circuit shown in Figure.3, determine the region of operation (active, saturation or cutoff) and the values of I_B , I_C and V_{CE} . The transistor has $\beta = 150$. (8 Marks)

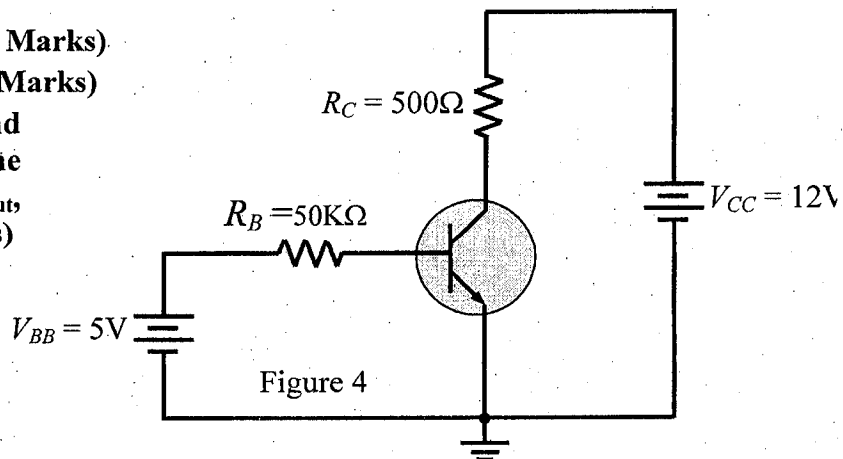


Figure 4

2015/1/1

إجابة الأسئلة

Faculty of Engineering

Second year

Code symbol: Gen 3114

Exam time: three hours



Department: Production Engineering

Subject: Mathematics 3

May exam for 2015/2016

Total Marks: 100 Marks

Answer the following questions:

Question 1:

[15 marks]

a) Derive the Cauchy–Riemann in the polar form and then show that the real and imaginary parts of the function $w = \ln z$ satisfy the Cauchy–Riemann equations when z is not zero.

[10 marks]

b) Show that $u(x,y) = x^2 - y^2$ is harmonic, then determine its harmonic conjugate $v(x,y)$ and then express the function $f(z) = u + iv$ in terms of z .

[5 marks]

Question 2:

[25 marks]

a) Expand $f(z) = \frac{1}{(z-1)(z-2)}$ in a Laurent series valid for $1 < |z| < 2$,

then use it to evaluate the integral $\int_C \frac{1}{(z-1)(z-2)} dz$ where $C: 1 < |z| < 2$ [10marks]

b) evaluate the following integral

1. $\oint_C \frac{4-3z}{(z-2)(z-1)} dz$, where $C: |z| = \frac{3}{2}$

2. $\oint_C \frac{z^2 + e^z}{z^2 - 6z + 9} dz$, where $C: |z| = 1$

3. $\oint_C \frac{e^z}{z(z+1)^2} dz$, where $C: |z| = 2$

[15marks]

Question 3:

[20 marks]

Prove that $\int_{-1}^1 P_n(x) P_m(x) dx = \begin{cases} 0 & \text{for } n \neq m \\ \frac{2}{2n+1} & \text{for } n = m \end{cases}$ then expand the function

$f(x) = \begin{cases} 0 & -1 < x < 0 \\ 1 & 0 < x < 1 \end{cases}$ in a series of the form $\sum_{k=0}^{\infty} A_k P_k(x)$

Question 4

[40 marks]

a) Evaluate each of the following integral

1. $\int_0^1 \frac{dx}{\sqrt{-\ln x}}$

2. $\int_0^{\pi/4} \frac{d\theta}{\sqrt{1-2\sin^2 \theta}}$ [20 marks]

b) A perfectly elastic string is stretched between two Points 10 cm apart. A point P on the string 2 cm from the left – hand end, i.e. from origin, is drawn aside 1 cm from its position of rest and released with zero velocity. Solve the one – dimensional wave equation to determine the displacement of any point at any instant. [20 marks]

Best wishes

Dr. Ahmed Mahsoub