



Academic level : First year

Course Name : Engineering Math. (4)

**Answer all of the following questions:**

**Question No. 1:**

**(10 Marks)**

(1.a) Find the directional derivative of  $\phi = xy^2 - 4x^2y + z^2$  at the point  $(1, -1, 2)$  in the direction of  $6\mathbf{i} + 2\mathbf{j} + 3\mathbf{k}$ . Determine the behavior of  $\phi$  in the indicated direction. Then, find the maximum and minimum values of this directional derivative. **(5 Marks)**

(1.b) If  $\underline{F} = (x^2y^3 - z^4)\mathbf{i} + 4x^5y^2z\mathbf{j} - y^4z^6\mathbf{k}$ , find: **(5 Marks)**

(I)  $\text{curl } \underline{F}$  (II)  $\text{div } \underline{F}$  (III)  $\text{div curl } \underline{F}$  (IV) If  $\phi = \text{div } \underline{F}$ , then find  $\text{curl grad } \phi$

**Question No. 2:**

**(20 Marks)**

(2.a) If the force field  $\underline{F} = (2xy + z^3)\mathbf{i} + x^2\mathbf{j} + 3xz^2\mathbf{k}$ , then

(I) Show that it is a conservative force field.

(II) Find its scalar potential  $\phi$ .

(III) Find the work done in moving a body in this field from  $(1, -2, 1)$  to  $(3, 1, 4)$ .

(IV) Evaluate  $\oint_C \underline{F} \cdot d\underline{r}$  where  $C$  is any closed curve in the domain of the force field. **(5 Marks)**

(2.b) Find the area of the circle  $x = a \cos \theta$  and  $y = a \sin \theta$  using Green's theorem. **(5 Marks)**

(2.c) Evaluate  $\iint_S \text{curl } \underline{F} \cdot \underline{n} dS$  where  $\underline{F} = (x^2 + y - 4)\mathbf{i} + 3xy\mathbf{j} + (2xz + z^2)\mathbf{k}$  and  $S$  is the surface of the paraboloid  $z = 4 - (x^2 + y^2)$  above the  $xy$  plane. **(5 Marks)**

(2.d) Evaluate  $\iint_S \underline{r} \cdot \underline{n} dS$  where  $S$  is the spherical surface of radius 2 and centered at origin. **(5 Marks)**

**Question No. 3:**

**(20 Marks)**

(3.a) Evaluate each of the following using Gamma function definition: **(6 Marks)**

(I)  $\Gamma\left(-\frac{7}{2}\right)$

(II)  $\int_0^1 \frac{dx}{\sqrt{-\ln x}}$

(III)  $\int_0^\infty e^{-x^3} dx$

(3.b) Evaluate each of the following using Beta function definition: **(9 Marks)**

(I)  $\int_0^{2\pi} \sin^8 \theta d\theta$

(II)  $\int_0^{\pi/2} \sin^3 \theta \cos^2 \theta d\theta$

(III)  $\int_0^a y^4 \sqrt{a^2 - y^2} dy$

(3.c) Prove that: **(5 Marks)**

$$J_{1/2}(x) = \sqrt{\frac{2}{\pi x}} \sin x \quad \text{if you know that} \quad J_p(x) = \sum_{n=0}^{\infty} \frac{(-1)^n}{n! \Gamma(n+p+1)} \left(\frac{x}{2}\right)^{2n+p}$$

End of Questions

Good Luck

الفرقة الأولى  
ص ١٤



University	: Menofia	Date	: 27/5/2019
Faculty	: Electronic Engineering	Time	: 90 M.
Department	: Physics & Eng. Maths.	No. of Pages	: 2
Academic Level	: First Year	Full Mark	: 150 Marks
Course Name	: Emg. Math.	Exam	: Terminal
Course Code	: PM4	Examiners	: Prof. R. El-Shanawany

Answer all the following.

1. (18 Marks)

- (a) Evaluate  $\iint_D f(r, \theta) dA$  where  $D$  is the region bounded by the curve  $r = 1$  and the lines  $\theta = \frac{\pi}{6}$  and  $\theta = \frac{\pi}{3}$ .
- (b) The solid  $S$  enclosed by the elliptic paraboloid  $z = 3x^2 + y^2$  and  $z = 4 - x^2 - y^2$  has constant density 1. Express  $M_{xy}$ , its moment w.r.t. the  $xy$ -plane, as an iterated triple integral.
- (c) Use double integration to find the area of the region  $D$  bounded by the curves  $y = x^2$  and  $2y = x^2 + 1$ .

2. (18 Marks)

- (a) Let  $f(x, y) = 3x + 2y$  be defined on the region bounded by the line  $y = x$  and  $y = x^2$ . Evaluate both iterated integrals type 1 and type 2.
- (b) Using simplex method to determine  $x_1$  and  $x_2$  that maximize  $f(x) = 2x_1 + x_2$ , subject to

$$x_1 + 2x_2 - 10 \leq 0$$

$$x_1 + x_2 - 6 \leq 0$$

$$x_1 - x_2 - 2 \leq 0$$

$$x_1 - 2x_2 - 1 \leq 0$$

and

$$x_1, x_2 \geq 0$$

- (c) Use spherical coordinates to find the volume of a sphere of radius  $\gamma$ .

3. (14 Marks)

(a) Evaluate  $\int_0^2 \int_y^2 2ye^{x^3} dx dy$ .

- (b) Using graphical method to maximize  $f(x) = x_1 + x_2$ , subject to  $-2x_1 + x_2 \leq 1$ ,  $x_1 \leq 2$ ,  $x_1 + x_2 \leq 3$  and  $x_1 \geq 0$ ,  $x_2 \geq 0$ .



الاسم :  
رقم الجلوس :

الكلية : ..... الفرقة : .....

أجب عن جميع الأسئلة الآتية من رقم ١ إلى ٢٠ بالتظليل للإجابة وفقاً للإختيار صحيح أو خطأ

بين (a,b) والإختيار من إجابات متعددة بين (a,b,c,d) في نموذج الإجابة المرفق.

علماً بأن كل إجابة لها درجة واحدة والمجموع الكلي للدرجات ٢٠ درجة

(أولاً) العبارات التالية منها الصحيح ومنها الخطأ اقرأ كل عبارة ثم سجل إجابتك بالتظليل للدائرة في نموذج الإجابة حيث (a) للعبارة

الصحيحة و (b) للعبارة الخاطئة :

١. الحقوق الجماعية هي حقوق لصيقة بمجموعات بشرية مختلفة ، ولقد ظهر البعض من هذه الحقوق منذ مدة طويلة ، كما هو الشأن بالنسبة لحقوق الأقليات ، فالمجموعات البشرية التي ترتبط بها هذه الحقوق تتراوح من الأسرة إلى الشعب بكامله إنطلاقاً من إنتمائه السياسي أو الثقافي.
٢. يعتبر الحق في التنمية أحد حقوق الإنسان الجماعية في ضوء الإعلان العالمي لحقوق الإنسان والدستور المصري لعام ٢٠١٤م.
٣. عرف البنك الدولي الفساد بأنه لا يشمل إستعمال الوظيفة العامة للكسب الخاص.
٤. عرفت منظمة الشفافية الفساد بأنه إساءة إستعمال السلطة ، أو سوء إستعمال المرء للسلطة التي أوتمن عليها لتحقيق مكاسب خاصة أو شخصية.
٥. كان أفلاطون في جمهوريته الفاضلة يقضى بحرمان العبيد من حق المواطنة ، وإجبارهم على الطاعة والخضوع للأحرار سادتهم.
٦. قواعد حقوق الإنسان هي: نتاج تطور طبيعي ، وتلقائي لقواعد الحرية والمساواة.
٧. من أهم خصائص ومبادئ فكرة حقوق الإنسان أنها لا تشتري وتكتسب وتورث.
٨. الحقوق الفردية وهي تلك الحقوق التي يجب أن تتوافر لكل فرد، وهي تترتب للفرد بإعتباره شخصاً.
٩. تعتبر الشفافية عنصراً أساسياً للتنمية الشاملة والمستدامة في المجال الإقتصادي والإجتماعي ، سواء في الشؤون والأنشطة العامة التي تتعلق بأجهزة الدولة ومرافقها.
١٠. الفساد يلعب دوراً إيجابياً على حقوق الإنسان في الأمن والطمأنينة ، وعلى حقوقه السياسية والإقتصادية والإجتماعية ، وعلى حقه في الحماية القانونية وحقه في التقاضي والدفاع الشخصي والقانوني.

تابع باقي أسئلة الامتحان في الصفحة التالية



(ثانياً) تخير إجابة واحدة مناسبة مكان النقاط من (a, b, c, d) وظلل إجابتك في نموذج الإجابة وفقاً لرقم السؤال:

١١. تعتبر ..... بين الأنشطة الاقتصادية أو الإنتاجية أو الخدمية عنصراً أساسياً للتنمية والتطور ، فإذا كان هناك نشاط معين يتم إحتكاره من قبل الدولة أو من قبل هيئات يكون لها وحدها القيام به دون غيرها.

a- الشفافية      b- المنافسة      c- التنمية      d- لا توجد إجابة

١٢. تعتبر ثورة ..... من أهم الثورات التي جاءت لتجسيد معايير ومفاهيم حقوق الإنسان في تلك الفترة ، حيث دعا إلى السلام والرحمة والتسامح ، ونبذ الحروب ونشر المساواة بين الناس في شئونهم الدينية.

a- الرومان      b- اخناتون      c- أرسطو      d- لا توجد إجابة

١٣. تميزت حقوق الإنسان بفكرة الحاكم الفيلسوف وبناء المدينة الفاضلة في العصر.

a- الفرنسي      b- الروماني      c- الحديث      d- لا توجد إجابة

١٤. يعتبر ..... أو الماجناكارتا الصادر في إنجلترا في ١٢ يونيو عام ١٢١٥م من المصادر التاريخية المكتوبة.

a- الميثاق الأعظم      b- لا توجد إجابة      c- الإجابة صحيحة      d- الإجابة خاطئة

١٥. الفساد ..... يرتبط بالإنسان ، لما يختص به من طباع وقدرة عقلية وذكاء عن سائر الكائنات الأخرى.

a- كظاهرة قديمة      b- كسلوك إجتماعي      c- في الديانات السماوية      d- لا توجد إجابة

(ثالثاً) تخير إجابة واحدة مناسبة مكان النقاط من (a, b, c, d) وظلل إجابتك في نموذج الإجابة وفقاً لرقم السؤال:

١٦. تنص المادة ..... من دستور عام ٢٠١٣م بالالتزام الدولة بوضع خطة شاملة للقضاء على الأمية الهجائية والرقمية بين المواطنين ، ووضع آليات تنفيذها بمشاركة مؤسسات المجتمع المدني - وفق خطة زمنية محددة.

a- ٢٥      b- ٢٩      c- ٢٦      d- ٢٨

١٧. في إطار قانون ٨ لسنة ١٩٩٩م والمعدل بالقانون رقم (١٣١) لسنة ٢٠٠٩م أكدت المادة ..... منه على أهمية المشاركة المجتمعية في مجال محو الأمية وتعليم الكبار.

a- الثانية      b- الرابعة      c- الخامسة      d- الثالثة

١٨. تصل نسبة الأمية في محافظة المنوفية في ٢٠١٨/١٢/٣١م إلى ٦٥٧.٣٤ أمى بنسبة تصل إلى .....% من عدد سكان محافظة المنوفية.

a- ١٥.٥%      b- ٣٤.٦%      c- ٢٣.٤%      d- ٢٠.٣%

١٩. خصص دستور مصر الجديد سبع مواد من المادة ..... حتى المادة ..... لكي يجعل التعليم حقاً لكل المواطنين.

a- المادة ٢٩ حتى المادة ٣٥      b- المادة ١٩ حتى المادة ٢٥

c- المادة ١٨ حتى المادة ٢٤      d- المادة ٢٧ حتى المادة ٣٣


٢٠. صدر القانون رقم ٨ في شأن محو الأمية وتعليم الكبار .....

a- في ١٤ إبريل سنة ١٩٩٣م      b- في ٢٤ مارس سنة ١٩٩٦م

c- في ١٤ مارس ١٩٩١م      d- في ١٤ فبراير سنة ١٩٩٤م



أ.م.د.

University : Menoufia		Date : June 2019
Faculty : Electronic Engineering		Time : 90 Minutes
Department : Electronics and Communications Engineering		No. of pages : 1
Academic level : First Year		Full Mark : 35 Marks
Course Name : Electronics (2)		Exam : Final Exam
Course Code : ECE 123		Examiner : Assoc. Prof. Ahmed Nabih Zaki Rashed

Question 1: Complete the following sentences with the correct answer: (15 Marks)

- JFET is abbreviation to....., while MOSFET is abbreviation to .....
- A major advantages of FET transistors are....., .....
- A FET is a .....controlled device.
- The basic terminals of FET transistors are ....., ....., and .....
- The main difference between depletion mode and enhancement mode in FET transistor is .....
- $V_p$  in FET transistor is called by ....., where the basic types of biasing in FET transistor are....., .....and .....
- Forward transconductance ( $g_m$ ) is rate of change of .....to the rate of change of .....when .....is constant.

Question 2:

(20 Marks)

- The 2N5459 JFET has typically  $I_{DSS}=9$  mA,  $V_{GS(OFF)}=-8$  V (maximum). Using these values, determine the drain current for  $V_{GS}=0$  V,  $-1$  V, and  $-4$  V.
- Voltage divider N channel enhancement MOSFET common source amplifier. Sketch the basic amplifier circuit diagram, sketch the small signal equivalent circuit and then find overall voltage gain. Sketch the output waveform for this circuit.
- JFET with voltage divider bias circuit has the following parameters:  $V_{DD}=12$  V,  $R_D=3.3$  K $\Omega$ ,  $R_S=2.2$  K $\Omega$ ,  $R_1=6.8$  M $\Omega$ ,  $R_2=1$  M $\Omega$ , and  $V_D=7$  V. Sketch the schematic view of the circuit. Estimate the gate voltage, the drain current, gate to source voltage and drain to source voltage.

مع تمنياتي لكم بالنجاح والتوفيق

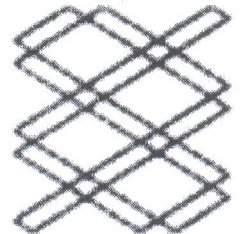
د. / احمد نبیه زکی راشد

**Part (II)**

Answer the following questions:

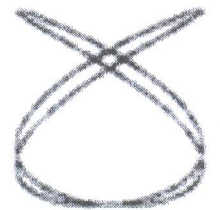
**Question (1): [15 Degree]**

- i) Explain the working principle of a linear variable differential transformer (LVDT). Show how it can be used for measuring small mechanical displacements.
- ii) Find the frequency ratios for the Lissajous patterns produced by voltage applied to vertical and horizontal plates as shown in Figures (a) and (b), respectively.



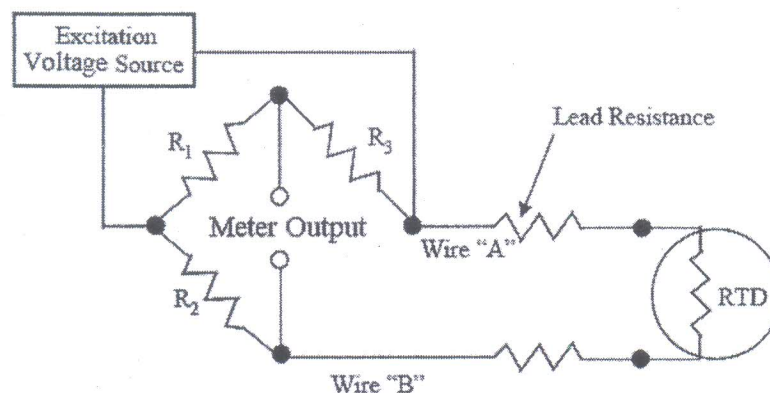
(a)

And find the frequency of the vertical plates if the frequency applied to horizontal plate is 70 Hz for the patterns shown in Figures (a) and (b).



(b)

- iii) A resistance temperature detector (RTD) arranged in a bridge with each arm  $R_1=150\Omega$ ,  $R_2=60\Omega$  and  $R_3=15\Omega$  and Excitation Voltage Source is 24V. If the temperature of the sensor changed such that the meter indicates 0.75 volt, the material has temperature coefficient of  $0.063\text{ }^{\circ}\text{C}^{-1}$ . The resistance at  $0\text{ }^{\circ}\text{C}$  is  $6\text{ }\Omega$ . Find the sensor temperature and the power consumed in it.

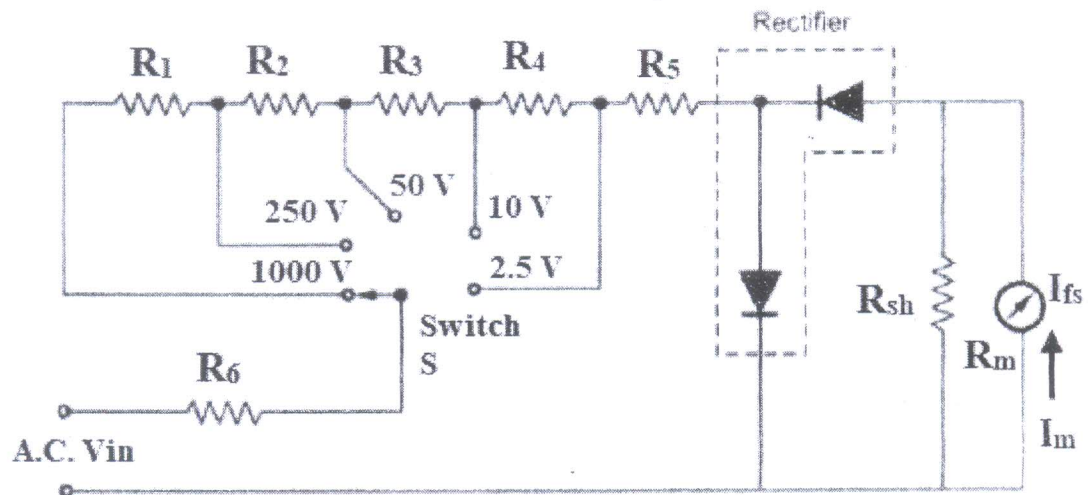


**Question (2): [15 Degree]**

- i) Describe the working of Maxwell's inductance-capacitance bridge. Derive the equations for balance condition. Explain why it is suitable for measurement of inductors having quality factor in the range 1 to 10.
- ii) With a neat sketch, briefly describe the principle of electromagnetic flow meter. What are the advantages of an electromagnetic flow meter?



- iii) Two voltages  $E_1$  and  $E_2$  have the same frequency are applied to both the horizontal input and the vertical input of the CRT, respectively. The resulted trace on the screen is a symmetrical ellipse about horizontal and vertical axis. The slope of the major axis is negative. The maximum vertical value is 3 divisions and the point where the ellipse crosses the vertical axis is 2.6 divisions. Determine the possible phase angle of  $E_2$  with respect to  $E_1$ .
- iv) A meter movement has an internal resistance of  $80\Omega$  and requires  $0.5\text{mA}$  dc for full scale deflection. Shunting resistance  $R_{sh}$  placed across the movement has a value of  $100\Omega$  and the value of  $R_6$  equal  $500\Omega$ . Diodes  $D_1$  and  $D_2$  of figure have an average forward resistance of  $70\Omega$  each and are assumed to have infinite resistance in reverse direction. Calculate the values of the multiplier resistors.



*Best Wishes*

*Dr. Ebrahim A. El-hamid*





## Part 1

### Answer all the following questions

#### Question No.1

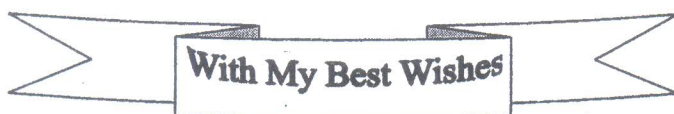
- 1- Give a detail explanation with the help of sketches for each of the following:
  - i- Zero order measuring instrument characteristic.
  - ii- First order measuring instrument characteristic.
  - iii- Digital measuring instrument.
- 2- A voltmeter and an ammeter are to be used to determine the power dissipated in a resistor. Both instruments are guaranteed to be accurate within  $\pm 1\%$  at full-scale deflection. If the voltmeter reads 80 V on its 150 V range and the ammeter reads 70 mA on its 100 mA range. Determine the limiting error for the power calculation?.


#### Question No.2

- 1- Define each of the following with the help of sketches and mathematical relations:
  - i- Padded source.
  - ii- Bridged T- attenuator.
- 2- A  $50 \Omega$  source of voltage with open circuit voltage of 2 volts rms is connected to a symmetrical T attenuator which has  $R_0 = 50 \Omega$  and  $a_{db} = 18$  db. What is the Thevenin equivalent of the output terminal of the attenuator?.

#### Question No.3

Indicate the problem of the frequency limiting effect of the voltage divider, and hence derive a mathematical relation for the frequency compensation of the voltage divider? (Demonstrate your answer with sketches).



University : Menoufia		Date : 20/6/2019
Faculty : Electronic Engineering.		Time : 3 Hours
Department : Computer Science & Eng.		No. of pages : 1
Academic level : 1 <sup>st</sup> Year, 2 <sup>nd</sup> Term		Full Mark : 70 Marks
Course Name : "Computer Organization".		Exam : Final Exam
Course Code : CSE 126		Examiner : Dr. A. SHOUMAN

**Answer all the following questions:**

### First Question

(20 Marks)

- Draw the 4-bit Bus system for four registers using multiplexers.
- Explain and Draw the operation of the 4-bit Binary Adder-Subtractor.
- If you have 4-bit adder-subtractor circuit has the following values for input mode M and data inputs A and B. In each case, determine the values of the outputs: S<sub>0</sub>, S<sub>1</sub>, S<sub>2</sub>, S<sub>3</sub>, and C<sub>4</sub>.

	M	A	B
1.	1	0101	1010
2.	1	1100	1000
3.	1	0111	0110
4.	0	1000	1001
5.	0	0000	0001

### Second Question

(19 Marks)

- Draw the Flowchart for program interrupt cycle.
- Draw the Block diagram of Control unit of basic computer.
- The content of PC (program counter) in the basic computer is 3AF (all numbers are in hexadecimal). The content of AC is 8EC3. The content of memory at address 3AF is 132E. The content of memory at address 32E is 08 AC. The content of memory at address 9AC is 7EC3.
  - What is the instruction that will be fetched and executed next?
  - Show the binary operation that will be performed in the AC when the instruction is executed.
  - Give the contents of registers PC, AR, DR, AC, and IR in hexadecimal and the values of I, and the sequence counter SC in binary at the end of the instruction cycle.

### Third Question

(20 Marks)

- Convert the following arithmetic expressions from infix to reverse Polish notation:
  - $A * B + C * D + E * F$
  - $A * B + A * (B * D + C * E)$
  - $A + B * [C * D + E * (F + G)]$
  - $A * [B + C * (D + E)]$   
 $F * (G + H)$
- How many times does the control unit refer to memory when it fetches and executes an indirect addressing mode instruction (Assuming one word per instruction or operand) if the instruction is:
  - A computational type requiring an operand from memory.
  - A branch type.
- A two-word instruction is stored in memory at an address designated by the symbol W. The address field of the instruction (stored at W + 1) is designated by the symbol Y. The operand used during the execution of the instruction is stored at an address symbolized by Z. An index register contains the value X. State how Z is calculated from the other addresses if the addressing mode of the instruction is:
  - direct.
  - Indirect.
  - Relative.
  - Indexed.

### Fourth Question

(11 Marks)

- Write a program to evaluate the arithmetic statement:  $X = (A - B) * (C - D)$ .
  - Using a general register computer with three address instructions.
  - Using a general register computer with two address instructions.
  - Using an accumulator type computer with one-address instructions.
  - Using a stack-organized computer with zero-address operation instructions.
- Given the 16-bit value 1001101011001101. What operation must be performed in order to:
  - 1- Clear to 0 the first four bits?
  - 2- Set to 1 the last four bits?
  - 3- Complement the first eight bits?

تمنياتي للجميع بالتوفيق.



Menoufia University  
Faculty of Electronic Engineering  
Dept. Industrial Electronics and Control Eng.  
Course: Electrical Power  
Course Field: Specialization Requirements  
Academic Level: First Year, 2<sup>nd</sup> Semester  
Academic Year: 2018 / 2019  
Course Code: ACE 124



Final Term Exam  
Date: 24 / 6 / 2019  
Exam Type: Written - b  
No. of Exam Pages: 2  
No. of Exam Questions: 4  
Exam Marks: 45 Marks  
Exam Time: 1.5 Hours  
Examiner: Dr. Essam Nabil

Answer the following questions:

Part – 1:

Question – 1: Put True (✓) or False (×) signs for the following expressions: [10 Marks]

1.	Fuel cells operate based on the photo-voltaic effect, which develops an emf. on absorption of ionizing radiation from Sun.	( )
2.	Tidal energy is a non-conventional sources of electrical power that always gives a fixed energy.	( )
3.	Nuclear power stations of generating electricity have cheaper initial cost, but expensive running cost.	( )
4.	When selecting a method of generating electricity, it is naturally desirable that the source must have not perpetuity.	( )
5.	A fuel cell has an ac output voltage typically of 1.23 volts at normal atmospheric pressure and temperature.	( )
6.	The non-conventional energy sources depends on producing steam for turbines which drive the alternators.	( )
7.	Geothermal energy is dependent on the capture of solar energy and conversion to a chemical (carbohydrate) fuel.	( )
8.	In wind turbine, the anemometer is used to increase the rotational speed to a level required by the generator to produce electric energy.	( )
9.	Photovoltaic Solar Cells are connected in series combinations to realize the rated current.	( )
10	The conventional energy sources are further advantageous due to virtually zero running cost.	( )

Question – 2: Determine the complete response of the circuit of Figure 1, where:

$$R = 5 \text{ k}\Omega; C = 1 \text{ }\mu\text{F}; L = 1 \text{ H}; V_s = 25 \text{ V}; v_C(0) = 5 \text{ V}$$



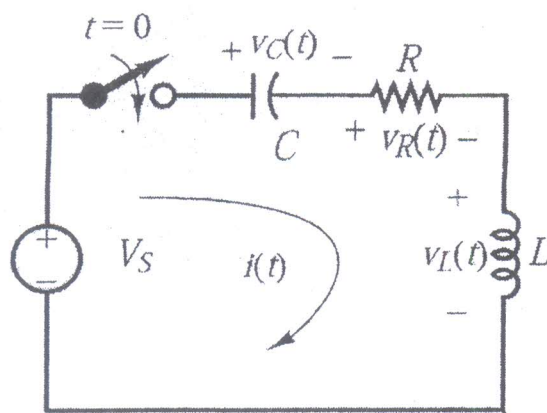


Figure 1

[12 Marks]

**Question – 3:** Consider the circuit shown in Figure 2, given  $V_s = 117\angle 0^\circ \text{ V}$  and  $f = 60 \text{ Hz}$ . Calculate the complex power and correct the power factor to be unity.

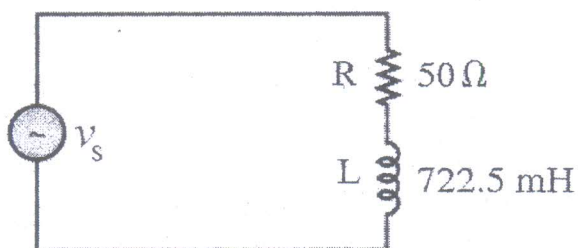


Figure 2

[13 Marks]

**Question – 4:** A series  $RLC$  circuit consists of  $R = 1000 \Omega$ ,  $L = 500 \text{ mH}$  and  $C = 0.1 \mu\text{F}$ . The applied voltage across the circuit is  $100 \text{ V}$ ;

- i. Find the resonant frequency of the circuit.
- ii. Determine the upper and lower half-power frequencies
- iii. Calculate the bandwidth of the circuit.
- iv. Sketch the relation between the circuit impedance  $Z$  and current  $i$  versus the frequency  $f$ .

[10 Marks]

*With best wishes*  
*Dr. Essam Nabil*



Faculty of Electronic Engineering  
Department of Industrial Elec. and Control Eng.  
First Year Students (2018 – 2019)  
Number of Pages: 4  
Number of Questions: 3



Electrical Power (ACE124)  
Final-term Exam of the 2<sup>nd</sup> Semester  
Q-form: Written-B  
Date: Mon. 24 / 6 / 2019  
Time allowed: 90 Min. / Part\_2

**Part – 2: Answer All of the Following Questions.**

**Question – 5: Write only the number of the most correct choice in your answer sheet for the following:** [15 marks]

1) The highlighted part of the transmission tower of Fig. (1) is called .....

- a) Body                      b) Base-plate                      c) Cage                      d) Cross-arms

2) The phase sequence before reversing the direction of rotation of the 3 $\phi$  generator rotor and interchanging two of its output lines is RBV. Its phase sequence after doing that will be .....

- a) RYB                      b) BYR                      c) BRV                      d) YBR

3) The balanced 3 $\phi$  resistive load presents ..... readings, when measuring its total power using the two wattmeter method.

- a) Equal      b) Different non-zero      c) One non-zero and other zero      d) One +ve and other –ve

4) The distance apart between two successive transmission towers is called the .....

- a) Cage                      b) Sag                      c) Span                      d) Boom

5) Delta-connected 3 $\phi$  motor has its total resistive part equals 50 $\Omega$  per phase. 10% of this resistive part is the ohmic resistive losses of the motor phase while the other 90% constitutes the motor output power. If the motor draws 10 A from the supply, then its output power will be .....

- a) 4.5 kW                      b) 1.5 kW                      c) 5 kW                      d) 13.5 kW

6) The AC resistance of the transmission line conductor is ..... to its skin depth.

- a) Directly proportional      b) Inversely proportional      c) Not proportional      d) Equal

7) The ratio of the phasor sum to the arithmetic sum of the output voltage from the alternator is called the ..... factor.

- a) Form                      b) Quality                      c) Distribution                      d) Power

8) In the power transformation stage of the power system, the step-up transformers are installed at the .....

- a) Generating stations      b) Distributing stations      c) Consuming loads      d) Other stations

9) Rigorous analysis is applied to ..... transmission line (TL) in order to derive its ABCD characteristic equations.

- a) Medium                      b) Bundled                      c) Short                      d) Long

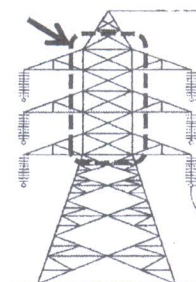


Fig. (1)

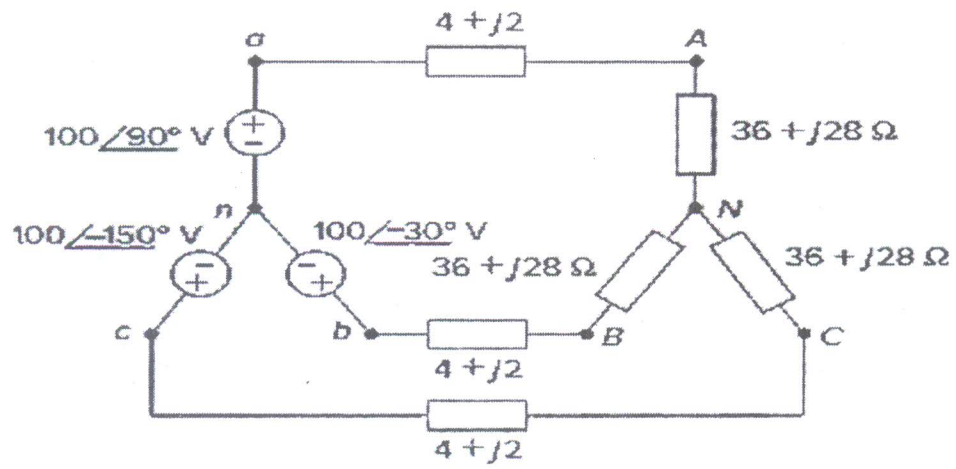


Fig. (2)

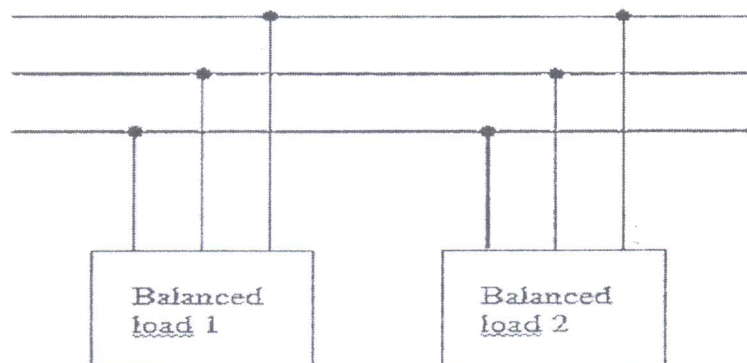


Fig. (3)

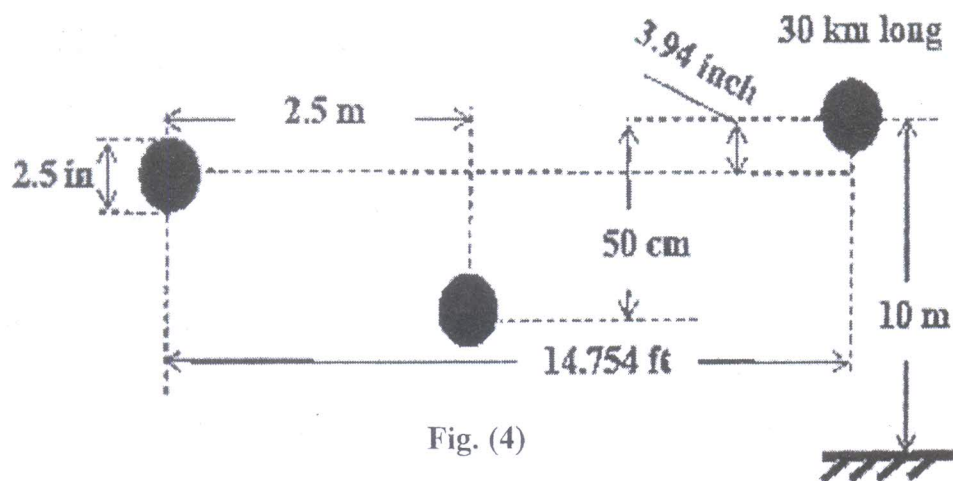


Fig. (4)

*With best wishes*  
*Dr. Essam A. Gomah*



---

Question – 7:

7-1)

[8 marks]

Two balanced loads are connected to a 300-kV, 50-Hz line, as shown in Fig. (3). Load\_1 draws 40 kW at a power factor of 0.6 lagging, while load\_2 draws 55 kVAR at a power factor of 0.7 lagging. Assuming the RYB sequence, determine:

- (a) The complex, real, and reactive powers delivered to the combined load.
- (b) The phasors of the line currents.
- (c) The kVAR rating of the three capacitors-connected in parallel with the load that will raise the power factor to 0.9 leading.
- (d) The capacitance of each capacitor. (the capacitors are STAR connected)

---

7-2)

[8 marks]

The system of OHTL depicted in Fig. (4) is used in power transmission of 33 kV, 50 Hz. The cables are made solid from Aluminum. The lines alignment is made on a straight line with the same inter-spacing between lines as in Fig. (4). The conductors of the TL system are transposed. The load is balanced with a current of 0.5 kA, and a power factor of 0.85 lag. Determine:

- i. The phasors of the voltage drops on the transmission lines.
- ii. The phasors of the phase voltages at the load.
- iii. The phasors of the phase voltages at the source.
- iv. The transmission efficiency.

[Assume Y-Y connected power system]

[Neglect the effect of line or ground capacitance]

$$[\rho_{Al}|_{20^{\circ}\text{C}} = 2.7 \times 10^{-8} \Omega \cdot m, 1 \text{ inch} = 2.54 \text{ cm}, 1 \text{ ft} \approx 30.5 \text{ cm}, , \mu_0 = 4\pi \times 10^{-7} \text{ H} \cdot m^{-1}].$$

---

- 10) In the lossless transmission line, the ..... of transmission line is equal to zero.  
a) Capacitance      b) Inductance      c) Resistance      d) Impedance
- 11) The output power of the 3Ø motor is greater when its phases are connected .....  
a) In parallel      b) Delta      c) Star      d) In series
- 12) Corona phenomena of the transmission line can be reduced by .....  
a) Stranding TL   b) Raising TL   c) Bundling TL   d) Isolating TL
- 13) The ..... part of the sending voltage has a greater value at the sending end and smaller value at the receiving end.  
a) Reflecting      b) Incident      c) Exponential      d) Constant
- 14) In the two-phase balanced source, the line voltage is equal to..... the phase voltage  
a) The same as      b)  $\sqrt{3}$       c) 2      d)  $\sqrt{2}$
- 15) The total VA drawn from the source is 200 kVA. While the power readings of the three wattmeters at the load are 30 kW, 45kW, 70 kW. So the vector phase angle of the load is .....  
a)  $\approx 35.9^\circ$       b)  $\approx 76^\circ$       c)  $\approx 54.1^\circ$       d)  $\approx 43.5^\circ$

Question – 6:

6-1)

[6 marks]

Regarding to the two wattmeter measuring method of 3Ø power, if the two readings are referred to as  $W_1$  and  $W_2$ , then answer the following:

- i. Draw the circuit diagram of the wattmeters' connections to 3Ø power system.
- ii. Draw the phasor diagram of the power system.
- iii. Prove that: the power factor of the load  $(P.F.) = \left[ 1 + 3 \left( \frac{W_2 - W_1}{W_2 + W_1} \right)^2 \right]^{-\frac{1}{2}}$

6-2)

[8 marks]

For the 3Ø power system shown in Fig. (2), determine the following:

- i. The phasors of the line currents.
- ii. The power consumed by the load.
- iii. The power lost in the transmission lines.
- iv.  $W_1$  and  $W_2$  readings of the two wattmeters connected at the load to measure the load power. [note that  $(W_1 + W_2)$  must equal the result of (ii)]

مستند  
الفرقة الأولى

Menoufia University  
Faculty Of Electronic Engineering  
Dept. Of Computer Sciences & Eng.  
1<sup>st</sup> Year - 2<sup>nd</sup> Term  
Dr. A. SHOUMAN



"Computer Organization"  
Exam: Mid Term Exam  
Date : 2 / 4 / 2018  
Time allowed: 1 Hour  
Course code : CSE 126

Name : ..... Sec: .....

**Answer the following questions:**

**First Question (10 degree )**

1. Draw the 4-bit arithmetic circuit and write its function table.
2. Explain why each of the following microoperations cannot be executed during a single clock pulse in the system shown in Basic computer registers connected to a common bus . Specify a sequence of microoperations that will perform the operation.
  - a.  $IR \leftarrow M[PC]$
  - b.  $AC \leftarrow AC + TR$
  - c.  $IR \leftarrow IR + AC$

**Second Question (10 degree )**

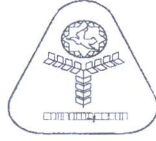
1. Draw the Block diagram of Control unit of basic computer
2. The content of PC (program counter) in the basic computer is 3AF (all numbers are in hexadecimal). The content of AC is 7EC3. The content of memory at address 3AF is 032E. The content of memory at address 32E is 09 AC. The content of memory at address 9AC is 8B9F.
  - a. What is the instruction that will be fetched and executed next?
  - b. Show the binary operation that will be performed in the AC when the instruction is executed.
  - c. Give the contents of registers PC, AR, DR, AC, and IR in hexadecimal and the values of I, and the sequence counter SC in binary at the end of the instruction cycle.

تمنيتي للجميع بالتوفيق



الفرقة الأولى  
مصر ٢٠١٩

Menoufia University  
Faculty of Electronic Engineering  
first Year  
2<sup>nd</sup> Term Mid Exam  
Dr. A. SHOUMAN



Project Management  
Code: UR 127  
Date: 4/ 04/ 2019  
Time allowed: one Hour

Name : ..... Sec: .....

**Answer the following questions**

1. Who is a Project Manager and what are his skills?
2. List the phases of project management process.
3. What is a Gantt chart and PERT chart? Compare the Gantt and PERT charts.
4. What are the sources of projects?
5. Discuss how you can Calculate the Expected Time Durations of a project Using PERT Equation .

University : Menoufia  
Faculty : Electronic Engineering  
Department : Electronics and  
Communications  
Engineering  
Academic level : First Year  
Course Name : Electronics (2)  
Course Code : ECE 123



Date : March 2019  
Time : 30 minutes  
No. of pages : 1

Full Mark : 10  
Exam : Mid Term Exam  
Examiner : Assoc. Prof. Ahmed  
Nabih Zaki Rashed

Student name:

Section:

Question 1:

(10 Marks)

- Sketch the basic output characteristic curve of junction field effect transistor. Clarify the basic regions of operation on the graph.
- Explain in details the difference in junctions between bipolar and field effect transistors. Clarify your answer in a table.
- Sketch the basic schematic view circuit diagram of fixed bias N-channel JFET. Show how to determine the drain current and drain to source voltage in the circuit?.

مع تمنياتي لكم بالنجاح والتوفيق  
د. / احمد نبيه زكي راشد



Name of Student

Section No:

Academic No

**Part I: The Bipolar Junction Transistor**

**Question One:** Multiple choice (chose the correct answer)

لاحظ أن: الأسئلة على الوجهين

- 1- The collector area is considerably greater than the emitter area. This is mainly due to:
  - (a) Its length should be greater than the minority carrier diffusion length.
  - (b) More doping than the emitter.
  - (c) Handel more power, hence more surface area is required for heat dissipation.
  - (d) Its area controls the amount of collector current.
- 2- The base width is small compared to:
  - (a) The minority carrier diffusion length.
  - (b) The base majority carrier diffusion length.
  - (c) The collector-base junction depletion width.
  - (d) Both (a) and (b).
- 3- The current components in a BJT are all diffusion currents. Since
  - (a) No potential difference within the depletion regions.
  - (b) The electric field is confined in all three regions (emitter, base, and collector).
  - (c) There is an electric field within the space charge regions.
  - (d) The potential is constant in all three regions (emitter, base, and collector).
- 4- .....is the most frequently encountered transistor configuration.
  - (a) Common-Emitter
  - (b) Common-Base
  - (c) Common-Collector
- 5- .....is the configuration used for matching purposes.
  - (a) Common-Emitter
  - (b) Common-Base
  - (c) Common-Collector

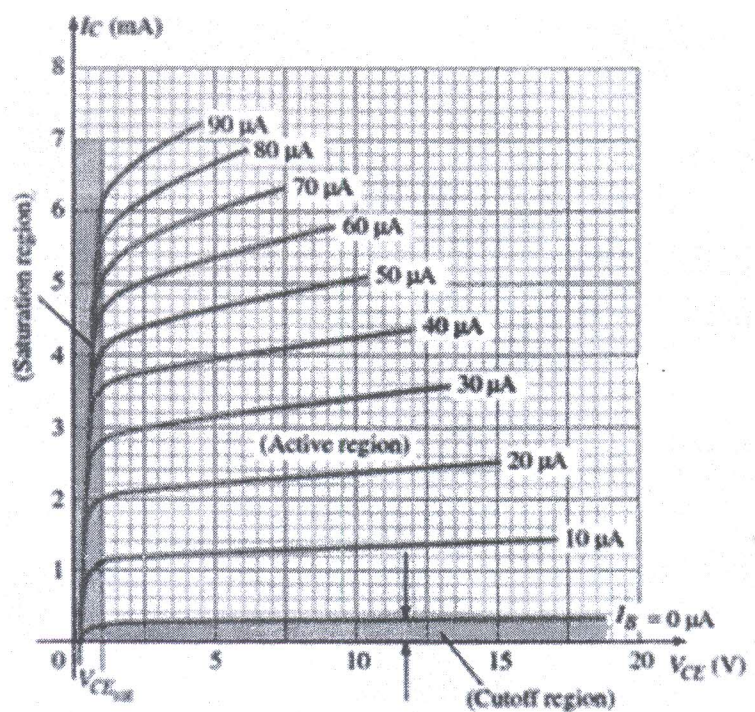
**Question Two:**

Sketch a figure to describe the majority- and minority-carrier flow of an *npn* transistor. Describe the resulting carrier motion.

**Question Three:**

Using the output characteristics given in Fig.

- (a) Determine  $\beta_{dc}$  at  $I_B = 30 \mu\text{A}$  and  $V_{CE} = 10\text{V}$ , then calculate  $\alpha_{dc}$  and the resulting level of  $I_E$ .
- (b) Determine  $I_{CEO}$  at  $V_{CE} = 10 \text{ V}$ .
- (c) Using the  $\beta_{dc}$  determined in part (a), calculate  $I_{CBO}$ .





Minoufia University  
Faculty of Electronic Engineering  
Dept. Industrial Electronics and Control Eng.  
Course: Electrical Power  
Course Field: Specialization Requirements  
Academic Level: First Year, 2<sup>nd</sup> Semester  
Academic Year: 2018 / 2019  
Course Code: ACE 124



Midterm Exam  
Date: 6 / 4 / 2018  
Exam Type: Written-a  
No. of Exam Pages: 2  
No. of Exam Questions: 3  
Exam Marks: 20 Marks  
Exam Time: 60 Minutes  
From 12:30 AM to 1:30 AM

Student Name: .....

Class: .....

**Answer the following questions:**

**Question – 1:** Put True (✓) or False (×) signs for the following expressions:

1.	When selecting a method of generating electricity, it is naturally desirable that the source must have perpetuity.	( )
2.	A fuel cell has a dc output voltage typically of 1.23 volts at normal atmospheric pressure and temperature.	( )
3.	The non-conventional energy sources depends on producing steam for turbines which drive the alternators.	( )
4.	Biomass energy is dependent on the capture of solar energy and conversion to a chemical (carbohydrate) fuel.	( )
5.	In wind turbine, the anemometer is used to increase the rotational speed to a level required by the generator to produce electric energy.	( )
6.	Photovoltaic Solar Cells are connected in series combinations to realize the rated current.	( )
7.	The non-conventional energy sources are further advantageous due to virtually zero running cost.	( )

b. What are the main reasons for electricity popularity of energy usage?

**Question – 2:** For the circuit of Figure 1, determine the capacitor voltage for all time.

If  $R_1 = 1 \text{ k}\Omega$ ,  $R_2 = 2 \text{ k}\Omega$ ,  $R_3 = 500 \Omega$ ,  $C = 250 \mu\text{F}$ ,  $V_1 = 100\text{V}$  and  $V_2 = 60 \text{ V}$ .

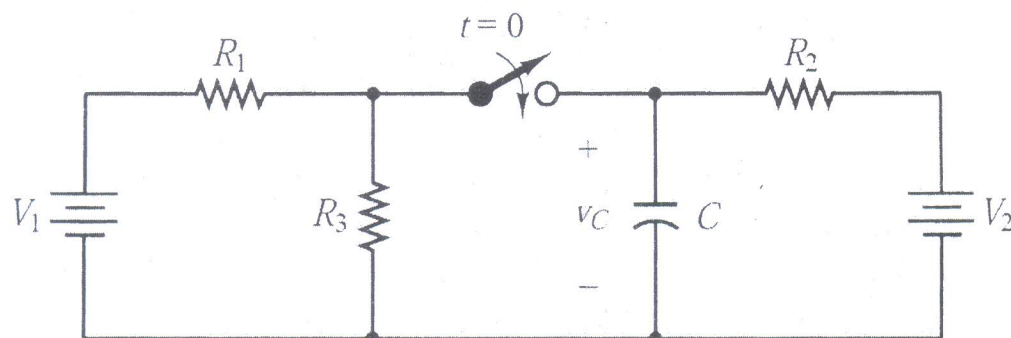


Figure 1

Question – 3: The following loads are connected in parallel:

- a. 200 KW at 0.8 power factor leading.
- b. 100 KW at unity power factor
- c. 500 KVA at 0.6 power factor lagging

Calculate the total power, and its power factor.

*With best wishes*



# الفرقة الأولى

MENOUFIA UNIVERSITY

Menouf, Faculty of Electronic Eng.  
Department of Phys. & Eng. Math.  
First year, Eng. math. 4  
Final exam



جامعة المنوفية

كلية الهندسة الإلكترونية بمنوف  
قسم الفيزيكا والرياضيات الهندسية  
الفرقة الأولى، رياضيات هندسية 4  
الإختبار النهائي

Monday, May 21 2018

Time of exam: 1.5 hours

Answer only three parts from each question.

1. (a) Evaluate  $\Gamma\left(-\frac{5}{2}\right)$  and  $B\left(-\frac{1}{4}, \frac{5}{4}\right)$ . [Use,  $\Gamma\left(\frac{1}{2}\right) = \sqrt{\pi}$ ]

(b) If  $\frac{1}{x^p} = \frac{1}{\Gamma(p)} \int_0^\infty e^{-xt} t^{p-1} dt$ , ( $p$  is constant) then prove that

$$\int_0^\infty x \sin x^3 dx = \frac{\pi}{3\Gamma[1/3]}.$$

(c) If  $u_n = \int_{-1}^1 x^{-1} P_n(x) P_{n-1}(x) dx$ , show that  $nu_n + (n-1)u_{n-1} = 2$ ,  
and hence evaluate  $u_n$ .

(d) Prove that

$$\int_0^t x J_n^2(x) dx = \frac{t^2}{2} \{J_n^2(t) - J_{n-1}(t) J_{n+1}(t)\} \quad \text{where} \quad J_n^2(x) = \{J_n(x)\}^2.$$

2. (a) Find the line integral by Green's Theorem

$$\oint_{\partial D} (x/y) dx + (2 + 3x) dy, \quad D : 1 \leq x \leq 2, \quad 1 \leq y \leq x^2.$$

(b) Test for existence of a potential function:  $3x^2 y^2 \mathbf{i} + (y^2 + 2x^3 y) \mathbf{j}$ .

(c) Determine a unit vector normal to the surface  $z = x^2 + 2y^2 + 1$  at  $(1, 2, 10)$ .

(d) Use Gauss' Theorem to evaluate the surface integral

$$\iint_{\partial E} (e^x \mathbf{i} + e^y \mathbf{j} + xyz \mathbf{k}) \cdot \mathbf{N} dS,$$

where  $E$  is determined by;  $0 \leq x \leq 1, \quad 0 \leq y \leq 1, \quad 0 \leq z \leq 1$ .

Best wishes

Dr. Hassan M. Abdelhafez

## Marks of questions

Question	1(a)	1(b)	1(c)	1(d)	2(a)	2(b)	2(c)	2(d)
Marks	8	8	8	8	8	5	5	8

Full mark is 50

## Special Functions' Relations

$$\Gamma(x) = \int_0^{\infty} e^{-t} t^{x-1} dt,$$

$$\Gamma(x) = \lim_{n \rightarrow \infty} \frac{n! n^x}{x(x+1)(x+2)\cdots(x+n)},$$

$$B(x, y) = \int_0^1 t^{x-1} (1-t)^{y-1} dt$$

$$B(x, y) = \int_0^{\infty} \frac{t^{x-1}}{(1+t)^{x+y}} dx$$

$$B(x, y) = 2 \int_0^{\pi/2} \cos^{2x-1} \theta \sin^{2y-1} \theta d\theta$$

$$\Gamma(x)\Gamma(1-x) = \frac{\pi}{\sin \pi x}.$$

### Legendre Polynomials and Functions

$$P_n(x) = \sum_{r=0}^{[n/2]} (-1)^r \frac{(2n-2r)!}{2^n r! (n-r)! (n-2r)!} x^{n-2r}.$$

$$P_n(x) = \frac{1}{2^n n!} \frac{d^n}{dx^n} (x^2 - 1)^n.$$

$$P_n(x) = \frac{1}{\pi} \int_0^{\pi} \{x + \sqrt{(x^2 - 1) \cos \theta}\}^n d\theta.$$

$$\int_{-1}^1 P_l(x) P_m(x) dx = \begin{cases} 0 & \text{if } l \neq m \\ \frac{2}{2l+1} & \text{if } l = m. \end{cases}$$

### Recurrence Relations

$$1. P'_n(x) = \sum_{r=0}^{[\frac{1}{2}(n-1)]} (2n-4r-1) P_{n-2r-1}(x).$$

$$2. x P_n(x) = \frac{n+1}{2n+1} P_{n+1}(x) + \frac{n}{2n+1} P_{n-1}(x).$$

$$3. (n+1) P_{n+1}(x) - (2n+1) x P_n(x) + n P_{n-1}(x) = 0.$$

$$4. P'_{n+1}(x) - P'_{n-1}(x) = (2n+1) P_n(x).$$

$$5. x P'_n(x) - x P'_{n-1}(x) = n P_n(x).$$

$$6. P'_n(x) - x P'_{n-1}(x) = n P_{n-1}(x).$$

$$7. (x^2 - 1) P'_n(x) = n x P_n(x) - n P_{n-1}(x).$$

$$8. (x^2 - 1) P'_n(x) = (n+1) P_{n+1}(x) - (n+1) x P_n(x).$$

$$9. \sum_{k=0}^n (2k+1) P_k(x) P_k(y) = \frac{n+1}{x-y} \{P_{n+1}(x) P_n(y) - P_n(x) P_{n+1}(y)\}.$$

### Bessel Functions

$$J_n(x) = \sum_{r=0}^{\infty} (-1)^r \frac{1}{r! \Gamma(n+r+1)} \left(\frac{x}{2}\right)^{2r+n}.$$

### Recurrence Relations

$$1. \frac{d}{dx} \{x^n J_n(x)\} = x^n J_{n-1}(x).$$

$$2. \frac{d}{dx} \{x^{-n} J_n(x)\} = -x^{-n} J_{n+1}(x).$$

$$3. J'_n(x) = J_{n-1}(x) - \frac{n}{x} J_n(x).$$

$$4. J'_n(x) = \frac{n}{x} J_n(x) - J_{n+1}(x).$$

$$5. J'_n(x) = \frac{1}{2} \{J_{n-1}(x) - J_{n+1}(x)\}.$$

$$6. J_{n-1}(x) + J_{n+1}(x) = \frac{2n}{x} J_n(x).$$



MENOUFIA UNIVERSITY

Department of communications

Microelectronics Technology



FACULTY OF ELECTRONIC ENGINEERING

2<sup>ND</sup> Semester, 1<sup>ST</sup> Year, 2018-2019

Midterm Exam, Time: 1 Hour

Name :

Sec :

**Answer the following questions**

**Question 1**

**10 Marks**

- (a) Compare -in a table- between: (Atomic Diffusion) and (Ion Implantation).
- (b) What is meant by (Quasi- intrinsic – Type conversion – Annealing – Sheet-resistance)?
- (c) Complete the following:
  - 1. By introducing the Aluminum in S.C. it will be ..... , while by introducing the Arsenic, it will be .....
  - 2. There are two basic ways in which atoms may diffuse: ..... diffusion and ..... diffusion.
  - 3. .... and .... are unwanted impurities.
  - 4. The intrinsic semiconductors are defined as ..... with band gaps of less than about .....

**Question 2**

**10 Marks**

- (a) Explain –with draw– the most common method used to determine type of conductivity of the S.C. material. When this method is not applicable?
- (b) Explain –with draw– how to determine the mobility of the electrons in a S.C. material which is doped by Bi.
- (c) The following data are obtained from the Haynes-Shockley experiment at 300 K:  $L=2$  cm,  $x_0 = 12$  mm,  $V_1 = 10$  V,  $t_0 = 150$   $\mu$ sec, and  $\Delta t = 33$   $\mu$ sec. Calculate the mobility and the diffusion constant and determine if these data satisfy the Einstein relation.

W96H B8E8 W9S0E8  
Dr. Mohamed Salah

Answer in the next page



Menoufia University  
Faculty of Electronic Eng.  
Industrial Elect. and Control Dept.  
First Year Exam.



Mid term Exam 2018-2019  
Time allowed: 1 hour  
Subject: Electrical Meas.  
Date: 2/4/2019

الدرجة:

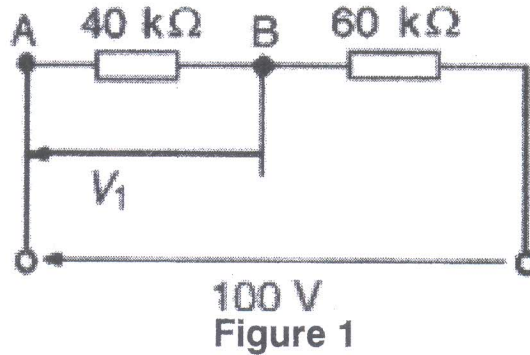
اسم الطالب/الطالبة:

رقم السكشن:

**Answer all the following questions**

**1-a** A voltmeter having a full scale deflection of 100V and a sensitivity of  $1.6 \text{ k}\Omega/\text{V}$  is used to measure voltage  $V_1$  in the circuit of Figure 1, Determine:

- The value of voltage  $V_1$  with the voltmeter is not connected,
- The voltage indicated by the voltmeter when connected between A and B?



**1-b** Draw and explain briefly each of the following:


- Deadweight pressure gauge.
- Petrol-tank level indicator.

**2-a** The expected value of the voltage across a resistor is 50V; however, measurements yields a value of 49V. Calculate:

- The absolute error.
- The percent of error.
- The relative accuracy.
- The percent of accuracy.

**2-b** Explain with the help of sketches each of the following:

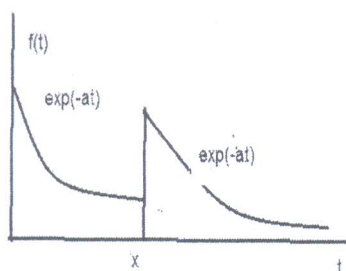
- Instrument characteristic with hysteresis.
- Instrument characteristic with dead space.

	Acad. Year: 2018/2019		Menoufia University			
	Semester: 2 <sup>nd</sup>		Faculty of Electronic Engineering			
	Year: second		General			
	Time of part one : 1 H		Course Title:		Communications Engineering	
	Examiners:	Prof..Abd-Elnaser A. Mohamed	Date:	2 /4/ 2019	Course Code:	Part ONE
			Half Term Exam			
Answer The Following Questions			No. of questions: 3			

### Question 1

(10 Marks)

- a) Write Short account on :
- Optical communication systems,
  - Wireless communication systems
- b) Express the function in terms of a sum of sine functions and draw the amplitude spectrum and phase spectrum:
- $$x(t) = -A_0 + A_1 \cos(\omega_1 t + \theta_1) - A_2 \cos(\omega_2 t) - A_3 \sin(\omega_3 t + \theta_3), \quad A_i > 0$$
- c) Using the modulation theorem to find the F.T



### Question 2

(10 Marks)

- a)  $\text{Sinc}(2\pi Wt) \leftrightarrow \frac{1}{2W} \Pi\left[\frac{\omega}{2\pi(2W)}\right]$  using the duality theorem to find F.T
- b) Calculate the wavelength ranges for :
- Ultra high frequency,
  - Infrared light
- c) Compare between TDM and WDM

### Question 3

(10 Marks)

- a) Derive the expression of  $y(t) = x(3t+2)$ , assuming  $x(t) = \Pi(t/2)$
- Find the F.T of the following:
  - Unit step,  $u(t)$
  - Unit impulse,  $\delta(t)$
- b) Evaluate the following integral for the cases:
- $x = 0, \quad y = 4,$
  - $x = -10, \quad y = 5$

$$A = \int_x^y (t-1)(t+5)\delta(2t+5)dt$$

Total marks: 30

With my best wishes and regards