بسم الله الرحمن الرحيم

قسم الرياضيات-كلية العلوم
الفصل الدراسى الثانى ٢٠١٨/٢٠١٩م

Department of Mathematics
Faculty of Science

امتحان الفرقة الثالثة شعبة الرياضيات

المقرر : عمليات عشوائيةوتطبيقاتها رقم المقرر ورمزه : ٣٤٦ر١ الزمن : ثلاث ساعات

أجب عن خمسة أسئلة فقط مما يأتى :- درجة جزء كل سؤال (خمس درجات)

١-(أ) متغير عشوائي ثنائي متصل (X,Y) منتظم التوزيع في المجال $0 \le x,y \le 1$ أوجد التوقع الرياضي $E(Y|X=0.5)$.

(ب)- فى عملية برنولي العشوائية $\{X_n;n>0\}$ بالإحتمال $p=2/3$ إذا كان $X=X_1$ ، $Y=X_2+X_3+X_4$ أوجد دالة التوزيع الإحتمالية للمتغير العشوائي الثنائي (X,Y) واحسب الإحتمالات $P(X=Y)$ ، $P(X\le 3,Y\le 2.5)$.

٢-(أ) فى العملية العشوائية $\{Y_n;n>0\}$ إستنتج توزيع المتغير العشوائى $Y_n=X_1+X_2+\dots X_n$ ثم اوجد تباين مربع هذا المتغير.

(ب)- فى العملية العشوائية $\{Y_n;n>0\}$ بفرض أن $p=2/3$ إحسب كل من :

$$P(Y_4=2\,,\,Y_5=4\,,\,Y_{12}=6)\;,\;P(Y_4^2)\;,\;E(Y_9|Y_4)$$

٣-(أ) عرف عملية أزمنة النجاح العشوائية $\{T_k;k>0\}$ واستنتج توزيع المتغيرالعشوائى T_k واذكر فقط توزيع الفرق بين المتغيرين T_{k+1} ، T_k لجميع قيم $k>1$.

(ب) فى العملية العشوائية $\{Y_n;n>0\}$ ، عملية أزمنة النجاح $\{T_k;k>0\}$ وضح العلاقة بين T_k ، Y_n ثم احسب الإحتمال $P(T_2=4\,,\,T_5=10\,,\,T_9=13)$ أوجد كذلك كل من : $E(T_5|T_1=3\,,T_2=9\,,T_3=12)$ ، $V(3T_5-5T_3)$.

٤-(أ) اذكر الفروض الإحتمالية في عملية بواسون العشوائية أو عملية الوصول المعدودة ثم استنتج الإحتمال $P_0(t)$.

(ب)- فى عملية بواسون العشوائية $\{N_t;t\ge 0\}$ بالبارامتر λt أوجد معامل الإرتباط بين عددى الوصول N_{t+1} ، N_t .

٥-(أ) فى عملية التجديد العشوائية (رينوال) $R=\{R_n;n\in N\}$ عرف المتغير العشوائى R_n موضحا ذلك بمثال وضح كذلك العلاقة بين R_n ، N_t .

(ب)- فى السؤال (٥-أ) عرف كل من R_{N_t} ، R_{N_t+1} والعلاقة بينهما ثم استنتج نهاية المقدار N_t/t عندما $t\to\infty$.

٦-(أ) عرف سلاسل ماركوف العشوائية المتقطعة ثم اوجد صيغة للإحتمال $P(X_0=x_0,X_1=x_1,\dots X_6=x_6)$.

(ب)- في إحدى المناطق الساحلية بفرض أن إحتمال أن يكون أى يوم ممطر خلال الأسبوع يساوى 2/3 وإحتمال أن يكون أى يوم ممطر يسبقه يوم جاف يساوى 1/3 ، إحتمال أن يكون أى يوم جف يسبقه يوم جاف يساوى 1/2 أوجد إحتمال أن يكون يومان متتاليان خلال الأسبوع متماثلين أوجد كذلك أن يكون اليوم الثالث فى الأسبوع جاف علما بأن اليوم الأول ممطر.

نهاية الأسئلة

أد/ محمود ابراهيم محمود ، أد/ زينهم فكرى جاهين

امتحان الفصل الدراسي الثاني للعام الدراسي 2018 – 2019 — المادة : معادلات تفاضليه جزئيه و دوال خاصه

كلية العلوم — المستوي الثالث –مقرر 318 ر — الزمن : ثلاث ساعات

قسم الرياضيات — التاريخ 2019 / / — الدرجة الكلية : 50درجة

اجب عن خمسة فقط من الاسئلة الاتية :- (10درجات لكل سؤال:5 درجات لكل فقره)

1) (i) اوجد الحل العام للمعادله الاتية :- $\frac{y^2z}{x}p + xzq = y^2$

(ii) اوجد الحل الخاص للمعادله $x(y^2+z)p - y(x^2+z)q = (x^2-y^2)z$ و الذي يمر خلال المستقيم $x+y=0\ ,z=1$

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2) اوجد الحل العام لكل من المعادلتين:-

(i) $(D_1^2 - D_1D_2 - 2D_2^2)z = \log(2x+y)$

(ii) $(D_1^2D_2 - 2D_1D_2^2 + D_2^3)z = \frac{1}{X^3}$

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3) اوجد الحل العام لكل من المعادلتين:-

(i) $(3D_1D_2 - 2D_2^2 - D_2)z = \sin(2x+3y)$

(ii) $(D_1^2D_2 + D_2^2 - 2)z = e^{2y}cos3x$

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4) *(i)* اثبت ان $\Gamma(m+n)B(m,n) = \Gamma(m)\Gamma(n)$

(ii) احسب التكامل الاتي : $\int_a^b (b-x)^{m-1}(x-a)^{n-1}dx$

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5) (i) استخدم طريقه فربينوس في حل معادلة بسل التفاضلية $x^2y'' + xy' + (x^2-n^2)y = 0$

(ii) اثبت ان $J_{n+1}(x) = \frac{2n}{x}J_n(x) - J_{n-1}(x)$

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6) (i) استنتج التمثيل التكاملي للدالة فوق الهندسية ${}_2F_1\ (a,b;c;x)$

(ii) اثبت ان $sin^{-1}x = x\ {}_2F_1\ (\frac{1}{2},\frac{1}{2};\frac{3}{2};x^2)$

انتهت الأسئلة مع اطيب الامنيات بالنجاح

لجنة الممتحنين د. مجدي كامل الجندي ، د. محمد عبد الله عبد الرازق

قسم الرياضيات كليـــة العلوم جـــامعـــة أسيـــوط إمتحان نصف الفصل الدراسى الثاني ٢٠١٨/٢٠١٩	المقرر: نظرية الحلقات والحقول(٣٢٢ر) االمستوى: الثالث الدرجة الكلية : ٥٠ درجة زمـن وتاريخ الأمتحان: ساعتان(٣ /٦ /٢٠١٩م)	

أجب فقط على خمسة أسئلة من الأسئلة التالية (١٠ درجات لكل سؤال)

١- بفرض أن $*$ ، $\circ$ عمليتان دامجتان حيث

$$a*b=a+b-1 \quad \forall a,b\in Z \ , \ a\circ b=a+b-ab \quad \forall a,b\in Z\}$$

أ) أثبت أن النظام $(Z,*,\circ)$ حلقة نامة . (٦ درجات)

ب) هل النظام $(R,*,\circ)$ حقل ؟ (٤ درجات)

٢- أ) إذا كان $(R,*,\circ)$ حقلا فهل بالضرورة أن يكون $(R,\circ,*)$ حقلا ؟ (٥ درجات)

ت) إذا كان φ تشاكلا من حلقة الأ عداد الحقيقية $(R,+,\cdot)$ ألى نفسها

هل $S=\{a\in R:\varphi(a)=\sqrt{a}\}$ حلقة جزئية ؟ (٥ درجات)

٣- بين العلاقة بين الحقل والحلقة التامة وذلك بالبرهان والأمثلة التوضيحية (١٠ درجات)

٤- لأي عدد أولي n أثبت أن $(Z_n,+_n,\cdot_n)$حقلا علما بأن $\cdot_n$ توزيعية على $+_n$. (١٠ درجات)

٥- أ) أثبت أنه يوجد على الأكثر تشاكل واحد يجعل حلقة ما $(R,+,\cdot)$ متماثلة مع $(Z,+,\cdot)$. (٥ درجات)

ب) أثبت أن الحلقة $(R,+,\cdot)$ بدون قواسم للصفر إذا وفقط إذا حققت قوانين الحذف الضربي . (٥ درجات)

٦- أ) إذا كان φ تشاكلا شاملا من حلقة بمحايد $(R,+,\bullet)$ إلى حلقة بمجايد $(R',+',\bullet')$ فأثبت أن

$\varphi(1)=1'$ وأن العماية $'$ • إبدالية متى كانت العملية • إبدالية . (٥ درجات)

ب) بفرض أن $(R,+,.)$حلقة بمحايد محتوية على a^{-1} لكل $a\in R-\{0\}$

فأثبت أن φ تشاكل من الحلقة إلى نفسها حيث $\varphi(x)=a\cdot x\cdot a^{-1}$ (٥ درجات)

.....

أنتهت الأسئلة ،،،،،،،،،،،،،،،،،تمنياتي بالتوفيـــق،،،،،، أ.د/ أحمد علام

امتحان نهائي الفصل الدراسي الثانى
للعام الجامعي ٢٠١٨/٢٠١٩ ٢٠
المقرر: تحليل عددي(٣٢٣ر)
الفرقة:المستوي الثالث الدرجة ٥٠ درجة
كلية العلوم - قسم الرياضيات التاريخ : ٢٠١٩/٦/٣ الزمن: ثلاث ساعات

Answer five questions only :- (10 marks for every question)

1-a) If the bisection algorithm is applied to a continuous function f on an interval $|a\ ,b|$,with quantities $a_0, b_0, c_0, a_1, b_1, c_1$ and so on ,where $f(r) = 0, f(a)f(b) < 0$, then after n steps prove that:$|r - c_0| \leq \frac{b_0 - a_0}{2^{n+1}}$

1-b) Verify that when Newton's method is used to compute $\left(\frac{1}{a}\right), a \neq 0$. (by solving the equation $f(x) = \frac{1}{x} - a = 0$) the sequence of iterates is defined by $x_{n+1} = x_n(2 - a\, x_n)$ and show that this equation is quadratic convergence.

2-a) Solve the following integral using simpson's method and find the error using the error formula and compare to the actual error
$\int_0^1 \frac{dx}{1+x^2}$, $h = 0.25$

2-b)Solve the following equation $x^3 + 4x^2 - 10 = 0 \quad \forall x \in [1\ ,\ 2]$ by using fixed point iteration [NOTE: using three iteration]

3-a) Derive Lagrange interpolating polynomial of *the second* degree .

3-b)Construct the Lagrange interpolating polynomial for the following function $f(x) = e^{2x} \cos 3x$, $x_0 = 0$, $x_1 = 0.3$, $x_2 = 0.6$ and find a bounded of the absolute error on the interval $(x_0\ ,\ x_2)$.

من فضلك انظر خلف الورقة .....

4-a) Solve the following system:

$8x - 3y + 2z = 20$

$6x + 3y + 12z = 35$ (Note: let $x^{(0)} = (0,0,0)$)

$4x + 11y - z = 33$

By using Gauss Seidel method (using three iterations only).

4-b)Derive Trapezoidal rule in the following formula :

$\int_{x0}^{x_1} f(x)dx = \frac{h}{2}[f(x_0) + f(x_1)] - \frac{h^3}{12} f''(\delta)$ where $h = x_1 - x_0$ and $x_0 < \delta < x_1$.

5-a) The Trapezoidal rule applied to $\int_0^2 f(x)dx$ gives the value 4, and Simpson's rule gives the value 2. What is $f(1)$?

5-b) **The following function values are exact values of an unknown polynomial :**

x	0	1	4	6
f(x)	1	-1	1	-1

Evaluate f (x) for x = 5 using Newton's formula for differences .

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6)Derive the formula of the Newton forward divided difference formula , and use this formula to obtain a polynomial of least degree the fits the values shown :

x	0	1	2	3
$f(x)$	4	9	15	18

GOOD LUCK

DR.Mohamed A . Hussien

2018-2019 2nd Term Date: 9-6-2019	**Final Exam for Level 3** **Subject: Artificial Intelligent Packages, MC352** **Time: 2 Hours**	**Mathematics Dept.** **Faculty of Science** **Assiut University**

Q1. A) Give a simple definition about agents and give some examples about agents.(15 marks)

b) Discuss the internal structure about RHINO Robot.

Q2. Complete the following table (9 marks)

	Accessibility	**Deterministic**	**Episodic**	**Static**	**Discrete**	**Agents No.**
Crossword Puzzle	.....	.....	.....	.....	.....	.....
Backgammon Game	.....	.....	.....	.....	.....	.....
Taxi Driver	.....	.....	.....	.....	.....	.....

Q3.a) Write the Tabu search algorithm (10 marks)

b) Maintain the types of memories in Tabu search and what is the dangerous of using memory?

Q4. a) Write the algorithm of genetic algorithm. (16 marks)

b) Write the algorithms of

- two point crossover ,
- roulette wheel selection.

c) Use the genetic algorithm method to find the maximum of the function $(15x - x^2)$,

(hint x is between 1 to 15 and we represent x as four binary)

Best Wishes

Dr. Alaa Fahim

Department of Mathematics		قسم الرياضيات
Faculty of Science	جامعة أسيوط	كلية العـــلوم
امتحان نهائى الفصل الدراسي الثانى للعام الجامعي 2019/2018م		
الفرقة: المستوى الثالث اسم المقرر:الأسس الرياضيه لنظرية المجال الكهرومغناطيسى ونظرية النسبيه الخاصه (332ر)	الشعبه:رياضيات	التاريخ: 2019/6/10 الزمن:ساعتان

اجب عن أربعة أسئله فقط مما يأتى:

السؤال الأول:

أ) استنتج نظرية جاوس للمجال الإلكتروستاتيكى ثم أوجد الصيغه التفاضليه لها ، ثم اكتب بدون إثبات معادلة دوران المجال ومنها استنتج المعادله $\underline{E} = -\nabla\Phi$ واشرح معنى Φ ثم استنتج معادلة بواسون .

ب) قضيب رفيع طوله L مستقيم منتظم الكثافه كتلته لوحدة الطول λ . أوجد جهده ومجاله عند أى نقطه تبعد عنه مسافه r . ومن ذلك أوجد جهد ومجال قضيب رفيع مستقيم لانهائى الطول عند نفس النقطه .

السؤال الثانى:

أ) استخدم نظرية جاوس لإيجاد شدة المجال الناشئ عن شحنه منتظمه كثافتها الحجميه ρ على شكل قشره كرويه سميكه نصفا قطريها الداخلى والخارجى $a\,,b$ على الترتيب وشحنتها الكليه Q عند أى نقطه تبعد عن مركز القشره بمسافه r .

ب) إذا كانت كثافة الفيض الكهربى $\underline{D} = 2x\,\underline{i} + 3\underline{j}$. أوجد الفيض الكلى الذى يعبر سطح مكعب طول ضلعه 2 ومركزه عند نقطة الأصل .

السؤال الثالث:

أ) اذكر العلاقه بين شدة المجال والجهد واحسب الشغل المبذول بالمجال $\underline{E}$ فى إزاحة وحدة الشحنات الموجبه على مسار ما . ومن ذلك استنتج تعريف الجهد وفرق الجهد بين نقطتين ، وكذلك الشغل المبذول بالمجال الإلكتروستاتيكى على مسار مقفل ومن ثم أوجد معادلة الدوران للمجال الإلكتروستاتيكى .

ب) احسب جهد نظام من الشحنات كثافته الحجميه ρ عند نقطه بعيده جداً عن النظام ومتجه موضعها بالنسبه للنظام $\underline{r}$ واكتب بدون إثبات طاقة جهد مزدوج عزمه $\underline{d}$ فى مجال خارجى شدته $\underline{E}$ واحسب الطاقه المتبادله بين مزدوجين عزماهما $\underline{d}_1\,,\underline{d}_2$ والمسافه بينهما r .

السؤال الرابع :

أ) باستخدام معادلة بواسون ، أوجد جهد ومجال كره مصمته متظمة الشحنه كثافة شحنتها الحجميه $\rho_\circ$ وشحنتها الكليه Q عند أى نقطه

ب) أذكر تحويلات لورنتز للفراغ والزمن واستنتج قانون جمع السرعات لأينشتين .

إلكترونان يتحركان على محور X الأول بسرعه $0.9c$ والثانى بسرعه $-0.9c$ كما رصدهما راصد ساكن حيث c سرعة الضوء ،أوجد سرعة الإلكترون الثانى بالنسبه للأول .

السؤال الخامس:

أ) ثلاث شحنات خطيه مستقيمه لانهائيه $A\,,B\,,C$ كثافة شحناتها الطوليه $\lambda\,,-\frac{\lambda}{2}\,,-\frac{\lambda}{2}$ على الترتيب ، وضعت موازيه لمحور X فى المواضع $(0\,,-d\,,0)\,,(0\,,d\,,0)(0\,,0\,,0)$ على الترتيب أيضاً .

أوجد شدة المجال عند النقطه $(0\,,0\,,h)$.

ب) أكتب تعريف المتجه الرباعى لكمية الحركه ومركباته والمتجه الرباعى للقوه ومركباته ومن ذلك استنتج العلاقه بين الكتله والسرعه والعلاقه بين الطاقه والسرعه وصيغة أينشتين .

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تمنياتنا لكم بالنجاح ،،،،،،،،،،،،

لجنة الممتحنين :

أ.د. فاروق على السيد – أ. د. فؤاد سيد إبراهيم

Assiut University
Faculty of Science
Dept. of Mathematics

Date : May 25 , 2019
Time allowad 3 hours

Second Semester Final Examination

Subject : Course No. 312 M Name of Course : Real Analysis 1

Students : Third Year Math.

Answer five questions only from the following:

First Question (10 Points)

(a) (2 points).**Show that every infinite subset of a countable set is countable.**

(b)(4 points) .**Find Sup S ,inf S ,max S and min S when:**

$$(i)\quad S=\{x:|2x+3|\le 1\} \qquad (ii)\ S=\{r\in Q, r^2<2\}$$

$$(iii)\ S=\left\{1+\frac{(-1)^n}{n},\ n\in N\right\} \qquad (iv)\ S=\left\{\frac{1}{n}+\frac{1}{m},\ n,m\in N\right\}$$

(c) (4 points). **Let A and B be nonempty bounded subsets of R .Prove that**

$(i)\ \sup(A-B)=\sup A-\sup B.$ $\qquad (ii)\ \inf(kA)=k\inf(A)\ ,\ k>0$

Second Question (10 Points)

(a) (3 points) .**Show that the supremum (infimum) of any nonempty set S is either a member of S or a limit point of S.**

(b) (4 points).**Using** $(\in -N)$ **definition to prove that:** $\lim_{n\to\infty}\sqrt[n]{n}=1$

(c) (3 points) . **Let** $(a_n),(b_n),(c_n)$ **be sequences such that:**

$a_n\le b_n\le c_n$ *for all* $n\ge 1$ *and* $\lim_{n\to\infty}a_n=L=\lim_{n\to\infty}c_n$. **Prove that** $\lim_{n\to\infty}b_n=L.$

Third Question (10 Points)

(a) (4 points) . **Show that the sequence** (a_n) **defined by**

$$a_1=\sqrt{7}\ \ and\ \ a_{n+1}=\sqrt{7+a_n}\ \ for\ \ n\in N,$$

converges to the positive root of the equation $x^2-x-7=0.$

(b) (3 points). **Show that every Cauchy sequence is bounded.**

(c) (3 points) .**Suppose** (a_n) **is a Cauchy sequence. Prove that** (a_n^2) **is a Cauchy sequence.but the converse is not true.**

Fourth Question (10 Points)

(a)(3 points). **Find the** $\overline{\lim}\ a_n$ *and* $\underline{\lim}\ a_n$ **for a sequence** (a_n) **,where**

$$(i)\ a_n=(-1)^n,(n=1,2,3,4,\ldots) \qquad (ii)\ a_n=\left(n^2\sin\frac{n\pi}{2}\right)^{n+1} \qquad (iii)\quad a_n=\frac{n-3n^2}{2n^2+1}$$

(b)(4 points).**Discuss the convergence of the following series:**

$$(i)\ \sum_{n=1}^{\infty}\frac{1}{(3n-2)(3n-1)} \qquad (ii)\ \sum_{n=1}^{\infty}\cot^{-1}(\frac{1}{n}).$$

(c) (3 points) **Show that the sequence** (a_n) **,where** : $a_n=\lim_{n\to\infty}(1+\frac{1}{n})^n, n=1,2,3,\ldots..$

is increasing and bounded .

P.T.O

Fifth Question (10 Points)

(a) (4 points). Define $f:R\to R$ by $f(x)=x^3$.

Show that f is continuous but not uniformly continuous on R.

(b) (2 points). Give an example for discontinuous functions f , g but f+9 is continuous.

(c) (4 points).State the intermediate value theorem and use this theorem to show that there is a solution of the equation: $x^5+3x+\sin x=\cos x+10$ in (0,2).

Six Question (10 Points)

(a) (3 points). Let $Let\ f:R\to R\ defined\ by:f(x)=\begin{cases}1 & ,\ x\ is\ rational\\ 0 & ,\ x\ is\ irrational\end{cases}$.

Show that f(x) is discontiouns at every point in R.

(b) (3 points) Establish the convergence or divergence of the sequence (y_n),where

$$y_n=\frac{1}{n+1}+\frac{1}{n+2}+.....+\frac{1}{2n}\quad for\ \ n\in N.$$

. (c) (4 points) $Let\ f:R\to R\ defined\ by:f(x)=\begin{cases}x\sin\frac{1}{x} & ,\ x\neq 0\\ 0 & ,x=0\end{cases}$

Find: $D^+f(0),D_+f(0),D^-f(0),D_-f(0)$.

Prof.R.A.Rashwan **The End**

Assiut University	Computer Networks
Faculty of Science	Third Level (MC354)
Mathematics Department	Time: 2 hours
Term Exam	May 2019

Answer the following questions: (50 Marks)

Question 1: Answer the following points (10 Marks)

1- Explain the internet "nuts and bolts"?
2- Explain the sources of packet delay?
3-What are protocols?
4-Explain Access network: digital subscriber line (DSL)?

Question 2: Answer the following points (10 Marks)

1-What is the network core?
2-Explain Packet Switching: queueing delay, loss?
3- Define throughput?
4- Define and explain traffic intensity?

Question 3: Answer the following points (10 Marks)

1- Explain the Internet protocol stack?
2- Mention some network applications?
3- Explain the application client-server architecture?
4- Explain P2P architecture?

Question 4: Answer the following points (10 Marks)

1- HTTP is "stateless". What does that mean?
2- Compare between persistent HTTP and non-persistent HTTP?
3- Give examples of HTTP response status codes?
4- Explain the term (web caches) and how it is useful?

Question 5: Answer the following points (10 Marks)

1-Give a DNS name resolution example?
2- Compare between multiplexing and demultiplexing? Support your answer with a diagram?
3-Define and explain the use of ACKs and NAKs?
4-Define and explain HOL? Support your answer with a diagram?

Dr. Tarik M. A. Ibrahim

Zoology Department

AssiutUniversity

Faculty of .Science

Final Exam.(Z316) 26-5-2019

(Marks50)

Put true or false for the followings:- (Marks 10)

1-Chondrotein sulphate consists of sulphatedN-acetylegalactoseamine+glucurinic acid.

2-Complex acid mucopolysaccharides consist of glucoseamine-glucourinic acid-sulphoric or phosphoric acid.

3-Simple acid mucopolysaccharides consists of glucosamine + glucouronic acid.

4-Visable lipids are easily demonstrated in cells and tissues by sudan black.

5- Masked lipids are combined with protein or surrounding by an outer protein film.

6-When spaces between polymers units is more than 0.4nm give metachromasia.

7-Colloidal gold and ferritin used in immunocytochemistry and investigated by EM.

8-Phospholipids are main components of structures of protoplasm.

9-After staining fat with SBB and investigated by LM lecithin is appeared orthochromatic.

10-Sudan black B is excellent for demonstration of phospholipids.

Choose the correct answers for the followings:- (Mrks 10)

1-Cerebroside &cholesterol are (a) -Ve (b) +Ve (c) both) with metachromasia.

2-Which of the followings is neutral mucopolysaccharides (a) chitin (b)mucin (c)glycogen).

3-Neutral mucopolysaccharides contain (a) acids (b) no acids (c) both.

4-Sulphated compounds were present in (a) neutral(b) acidic (c)complex mucopolysaccharides.

5- Which of the followings are anticoagulants (a) condrotein sulphate(b)heparin(c)-mucoprotein.

6-Virable fats are (a) depots (b) structured (c) both fat.

7-Cholestrole can be observed by (a) LM (b) polarized microscope (c) phase contrast microscope

8- Cant demonstrated in sections (a) polysaccharides (b) monosaccharides (c) disaccharides

9- Which fat disappears during fasting (a) constant (b) variable (c) both?

10- Unsaturated lipids stained with (a) oil red (b) UV+leucofuchsin (c)haematoxylin.

11-RNA can be demonstrated by (a)Feulgen (b)cresyle violet (c) Massion trichrome.

12-Antibodies is (a) visible (b) invisible (c)none .

13-Which of the followings is fluorchromes (a)fluorescein (b)histamine (c)haematoxylin.

14-Which of the followings is leucofuchsin (a) F(So2)2 (b)HCL (c)HIO4.

15-Usual concentration in metachromasia is (a) 1% (b) 10% (c) 40%) in 30% alcohols.

16- Pancreatic cells show intense cytoplasmic staining with hematoxylin because of a high concentration of

(a) DNA (b) RNA (c) Mitochondria

17-Which step in the histological preparation would have been most important in histological techniques?
(a)staining (b) fixation (c) sectioning (d) dehydration.

18- Mixtures of different antibodies to a single antigen are called

(a) polyclonal (b)monoclonal (c)both)antibodies.

19-Antibodies specific for a single epitope and produced by a single clone are called.

(a) polyclonal (b)monoclonal (c)both) antibodies.

20- In histochemical techniques we used (a) tissue homogenate (b) tissue sections (c) unfixed tissues.

3-Discuss three of the folowigs items :- (Marks 9)

1-Disadventages of fluorochrome labeled techniques.

2-Simple acidic mucopolysachharides

3-Metachromasia

4- Physical methods for demonstration of lipids.

5-Controle test for demonstration of carbohydrates

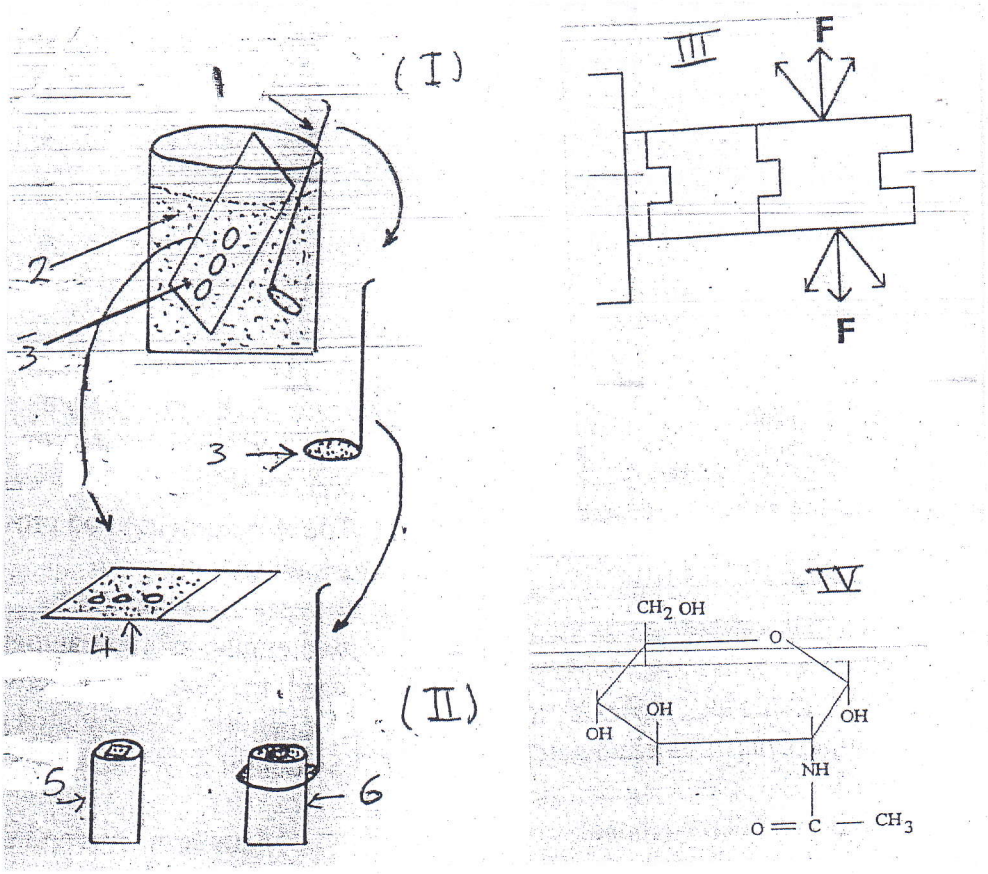
4-Write short notes on the condition of the followings:- (Marks 9)

1-Feulgen Reaction.

2-PAS reagent for polysaccharides.

3-Plasmal techniques

5- Put the labeled on the followings:- (Marks 12)



Good Luck Dr. Hanem S Abdel-Tawab

Second Term -Academic Year 2018/2019
Physiology (2) (217Z)
Time allowed 2 Hours
Date of Exam:25/5/2019

Part one (Nervous system):

1-Choose the correct answer (9 marks):

1- (Ependymal–Astrocyte- Microglial) are cuboidal cells lining the ventricles and spinal canal.

2- (Endorphins- Catecholamines- Acetylcholine) play a role in appetite, mood and learning.

3- (Epithalamus- Hypothalamus- Thalamus) sorts and relays information from all senses to higher level brain centers.

4- Degeneration of (basal ganglia cells-corpus collosum-limbic system) leads to Parkinson's disease.

5- (Medulla oblongata-Cerebrum-Cerebellum) can be trained to remember motor responses.

6- Trauma of (trochlear – oculomotor-optic) nerve can result in double vision.

7- Autonomic pathways always consist of 2 neurons in series, the 1st neuron is unmyelinated, while the 2nd neuron is myelinated (true - false).

8- Lateral horns located ONLY in (thoracic- lumbar- thoracic and lumbar) regions.

9- Fiber tract names reveal their origin and destination (true- false).

2- Answer on FOUR only of the following (16 marks):

1- By labeled diagram shows the mechanism of transmitter release from the presynaptic terminals

2- Discuss the synthesis and function of neurotransmitter serotonin.

3-Discuss the motor and sensory function of the vagus nerve.

4-By labeled diagram compare between the sympathetic and parasympathetic system.

5-Explain the function and component of the dorsal column ascending tract.

Good Luck

Prpf. Hossam El-Din M. Omar, Zoology Department, Faculty of Science, Assiut University

See Next Part

Part 2 (Endocrinology)

Q1- Choose the single correct answer **(10 marks)**

1. ---------- are released via synapses and travel via blood stream.

a. neurohormones b. endocrine hormones c. paracrine hormones d. autocrine

2. ---------- stimulates muscle contractions in the prostate gland to release semen.

a. testosterone b. oxytocin c. leutinizing hormone d. inhibin

3. ---------- stimulates the growth of muscle and bone.

a. thyroxine b. parathormone c. growth hormone d. prolactin

4. ---------- is a calcium lowering polypeptide hormone.

a. parathormone b. calcitonin c. thyroxine d. growth hormone

5. ---------- inhibits the formation of prostaglandins.

a. aldosterone b. cortisol c. epinephrine d. vasopressin

6. ---------- stimulates glycogenolysis and gluconeogenesis in the liver.

a. insulin b. glucagon c. aldosterone d. parathormone

7. ---------- converts testosterone into dihydrotestosterone.

a. Sertoli cell b. Leydig cell c. germ cell d. a and b

8. ---------- stimulates growth of the duct system of the breast.

a. progesterone b. FSH c. LH d. estrogen

9. ---------- is the site of final maturation of spermatozoa.

a. seminiferous tubule b. epididymis c. seminal vesicle d. prostate gland

10. ---------- ions secreted into tubular fluid help to maintain spermatozoa in a quiescent state.

a. calcium b. magnesium c. potassium d. sodium

Q2: Answer only three questions from the following: **(15 marks)**

a- Mention the functions of progesterone. (5 marks)

b- Illustrate by a diagram hormonal control of spermatogenesis. (5 marks)

c- Explain types of diabetes. (5 marks)

d- Mention only two functions of cortisol and regulation of its secretion. (5 marks)

Final Exam for Level 3
Subject: Image Processing
Course No.MC366
Time: 2 Hours

Mathematics Dept.
Faculty of Science
Assiut University

2nd Term 2018/2019
Date:June, 15, 2019

Answer the following questions (50 marks)

Q1. **Completethe following:** **(14 marks)**

- In High Level Process the input is .....(1)..... and the output is .....(2).....
- The machine vision system have different limitations such as .....(3).... And .....(4).....
- Raster (bitmap) image disadvantages are .....(5)..... and.....(6).....
- The matlab command .....(7)..... specifies a range of gray levels, such that all values lower than 100 will be displayed as black and all values greater than 160 will be displayed as white.
- .....(8)..... Images: These are the result of objects that are self-luminous, such as stars and light bulbs
- .....(9)..... is the size of the scene element that images to a single pixel on the image plane.
- The Sobel operators used to compute edges are .....(10)..... , ...(11).....
- Edge detector should have: .....(12)..... , ...(13).....
- .....(14)..... threshold values vary over the image as a function of local image characteristics

Q2. **(12 marks)**

a) Write the MATLAB script used to read an image I then do the following transformations: **(6 marks)**

I. Rotate the image counterclockwise rotation by angle 0=35
II. Translation the image by $\Delta x = 20$ and $\Delta y = 50$
III. Shear by a factor [sh_x =10, sh_y=0]

b) For the two 3 × 3 monochrome images below (X and Y), each of which represented as an array of unsigned integers, 8-bit (uint8), calculate Z = X + Y, using normalization and truncation. **(6 marks)**

$$X = \begin{pmatrix} 200 & 200 & 150 \\ 100 & 70 & 20 \\ 0 & 40 & 150 \end{pmatrix} \qquad Y = \begin{pmatrix} 105 & 150 & 270 \\ 200 & 10 & 200 \\ 150 & 10 & 10 \end{pmatrix}$$

Q3.	What are the main differences between: (12 marks) I. Coding redundancy and psychovisual redundancy II. Linear filters and nonlinear filters III. Lossless and lossy compression	**(12 marks)**
Q4.	a)**Write MATLAB code to implement** a linear filter that creates a horizontal blur over a length of 9 pixels, comparable to what would happen to a image if the camera were moved during the exposure interval. **(6 marks)** **b)** What is the Hough transform and how can it be used to postprocess the results of an edge detection algorithm?**(6 marks)**	**(12 marks)**

Best Wishes, Dr. Hanaa A. Sayed

Department of Mathematics		قسم الرياضيات
Faculty of Science		كلية العـــلوم

امتحان نهائي الفصل الدراسي الثاني للعام الجامعي ٢٠١٨/٢٠١٩م

للفرقـــــة : الثالثة رياضيات شعبة : الرياضيات

أسم المقرر : طرق رياضية الدرجة الكلية: ٥٠ درجة	رقم المقرر ورمزه: ٣٣٤ر	الزمن : ساعتان

أجب عن أربعة أسئلة فقط مما يأتي :- (الدرجة الكلية لكل سؤال ٥ر١٢ درجة)

١- أ) أوجد تحويل لابلاس للمشتقة التفاضلية للدالة $F(t)$ عند نقط الأتصال والأنفصال للدالة .

ب) برهن علي أن $$B(m,n)=\frac{\Gamma(m)\,\Gamma(n)}{\Gamma(m+n)}$$

جـ) برهن علي أن $$\int_0^{\infty}\sin x^2\,dx=\frac{1}{2}\sqrt{\frac{\pi}{2}}$$

إذا كانت $LF(t)=f(s)$ ، $LG(t)=g(s)$ برهن علي أن

$$L^{-1}f(s)\,g(s)=\int_0^t F(u)\,G(t-u)\,du$$

٢- أ) برهن علي أن

$$J_0(t)=\frac{1}{\pi}\int_{-1}^{1} e^{it\omega}(1-\omega^2)^{-1/2}\,d\omega=\frac{1}{\pi}\int_0^{\pi}\cos(t\cos\theta)\,d\theta$$

ب) حل المعادلات

$$(i)\ Y'''(t)-3Y''(t)+3Y'(t)-Y(t)=t^2e^t$$

$$Y(0)=1 \qquad Y'(0)=0 \qquad Y''(0)=-2$$

$$(ii)\ \int_0^t Y(u)\sqrt{t-u}\,du=t^3+t^4+t^5+.....+t^n$$

٣- أ) فك الدالة $0\le x\le\pi$ $f(x)=x(\pi-x)$ بدلالة

(i) جيب التمام ، (ii) بدلالة الجيب ثم أثبت أن

$$\sum_{n=1}\frac{1}{n^2}=\frac{\pi^2}{6}\ ,\ \sum_{n=1}\frac{(-1)^{n-1}}{n^2}=\frac{\pi^2}{12}\ ,\ \sum_{n=1}\frac{(-1)^{n-1}}{(2n-1)^3}=\frac{\pi^3}{32}$$

←

ب) حل معادلة التوصيل الحراري

$$\frac{\partial U}{\partial t}=\frac{\partial^2 U}{\partial x^2} \quad 0<x<3 \quad , \quad U(0,t)=U(3,t)=0, \quad U(x,0)=25^{\circ}c$$

٤- أ) برهن نظرية فورير التكاملية .

ب) برهن علي أن تحويل فورير للتكامل $\int_{-\infty}^{\infty} f(u)\, g(x-u)\, du$ هو حاصل ضرب تحويلي فورير للدالتين المكونتين .

ج) أوجد تحويل فورير لجيب التمام للدالة e^{-mx} ثم أوجد $\int_0^{\infty} \frac{\cos \alpha(x)}{m^2+\alpha^2} d\alpha$

٥- أ) أوجد تحويل فورير للدالة $f(x)\begin{cases}1 & |x|<a \\ o & |x|>a\end{cases}$ وأرسم الدالة كذلك تحويلها عند $a=3$

وأوجد قيمة التكامل $\int_{-\infty}^{\infty} \frac{\sin \alpha a \cos \alpha x}{\alpha} d\alpha$ ومن ثم $\int_{-\infty}^{\infty} \frac{\sin u}{u} du$

ب) باستخدام متطابقة برسفال للجزء (أ) برهن علي أن $\int_0^{\infty} \frac{\sin^2 u}{u^2} du = \frac{\pi}{2}$.

ج) أوجد حل محدود لمعادلة لا بلاس $\nabla^2 U = 0$ لنصف المستوي $y>0$ حيث U تأخذ القيمة $f(x)$ علي المحور x .

انتهت الأسئلة مع تمنياتنا بالتوفيق ،،،،

لجنة الممتحنين :- أ٠د/ نجاة عبد الرحمن حسين + أ٠ د/ فاروق علي السيد

2018-2019 2nd Term Date: 11-6-2019	**Final Exam for Level 3** **Subject: Scientific computing Packages, MC356** **Time: 2 Hours**	**Mathematics Dept.** **Faculty of Science** **Assiut University**

Answer the following questions:

Q1. a) Calculate the error of function f(x)= e^x at x = 2.025. (10 marks)

b) Using Congruential Generators to generate random number generator X_0 = 27, a = 17, c=43, and m = 100

Q2.a) Write the algorithm of newton raphson. (8 marks)

b) Find a solution to the equation by newton raphson for three step only

$0.5x^2 - 3 = 0$.(hint: $x_0 = 3$, tol= 0.001).

Q3. a) Write an algorithm for newton divided difference method (10 marks)

b) Using newton divided difference method to find y(9)

x	4	5	7	10	11
F(x)	48	100	294	900	1210

Q4. a) Write an algorithm for simpson 1/3 (10 marks)

b) Use the simpson rule 1/3 to approximate value to $\int_0^{10} \frac{1}{1+x^2}\, dx$ (h =1)

Q5. a) Write an algorithm for milne method by using runge kutta of order 2

b) Solve the following differential equation (12 marks)

$\frac{dy}{dx} = (x + y)y,\ y(0) = 1$ using the milne method to find y(0.4) (hint: use y(0.1), y(0.2) and y(0.3) from Euler method.

==Best Wishes==

Dr. Alaa fahim

أجب عن خمسة أسئلة فقط مما يأتى (كل سؤال 10 درجات-5 درجات عن كل فقرة):

السؤال الأول:

أ- اذا كانت $x > 0$ فأثبت ان $\Gamma(x) = \lim_{n\to\infty} \frac{n!\, n^x}{x(x+1)(x+2)\ldots(x+n)}$

ب- برهن ان $T_n(x)$ حل لمعادلة تشيبشف التفاضلية

$$(1-x^2)\frac{d^2y}{dx^2} - x\frac{dy}{dx} + n^2 y = 0$$

السوال الثانى:

أ- أثبت ان $\beta(m,n)\Gamma(m+n) = \Gamma(m)\Gamma(n)$

حيث m,n اعداد حقيقية تحقق ان $m,n > 0$

ب- اثبت ان $\frac{1-t^2}{1-2xt+t^2} = T_0(x) + 2\sum_{n=1}^{\infty} T_n(x)t^n$

السوال الثالث:

أ- باستخدام الدوال المولدة لدوال بسل اثبت ان $J_n(-x) = (-1)^n J_n(x)$

ب- اثبت ان

$$(\alpha-\beta)\,{}_2F_1(\alpha,\beta;\gamma;x) - \alpha\,{}_2F_1(\alpha+1,\beta;\gamma;x) + \beta\,{}_2F_1(\alpha,\beta+1;\gamma;x) = 0$$

السوال الرابع:

أ-أثبت علاقة التوليد التالية لدوال بسل $e^{\frac{x}{2}(t-\frac{1}{t})} = \sum_{n=-\infty}^{\infty} J_n(x)t^n$

ثم استنتج ان $J_{-n}(x) = (-1)^n J_n(x)$

ب- استنتج الصيغة التكاملية للدالة فوق الهندسية فى الصورة

$${}_2F_1(\alpha,\beta;\gamma;x) = \frac{1}{\beta(\beta,\gamma-\beta)}\int_0^1 t^{\beta-1}(1-t)^{\gamma-\beta-1}(1-xt)^{-\alpha}dt,$$

حيث $\gamma > \beta > 0,\ |x| < 1$

السوال الخامس:

أ- باستخدام دوال جاما وبيتا اوجد التكاملات الاتية

(i) $\int_0^2 \frac{x^2}{\sqrt{2-x}}dx$ (ii) $\int_0^\infty \frac{1}{\sqrt[6]{x^5}(1+x)^2}dx$

ب- اثبت ان $\sqrt{1-x^2}U_n(x) = xT_n(x) - T_{n+1}(x)$

بقية الاسئلة فى الخلف

السوال السادس:

أ- اثبت ان $${}_2F_1(\alpha,\beta;\gamma;x) = (1-x)^{-\beta}\,{}_2F_1\left(\gamma-\alpha,\beta;\gamma;\frac{x}{x-1}\right)$$

ب- اثبت ان $$\frac{d^n}{dx^n}\,{}_2F_1(\alpha,\beta;\gamma;x) = \frac{(\alpha)_n(\beta)_n}{(\gamma)_n}\,{}_2F_1(\alpha+n,\beta+n;\gamma+n;x)$$

بالتوفيق والنجاح ،،،

د. شعبان بكر

Final Term Exam (Operation Research 1)

Third Level

Assiut University

Faculty of Science

Department of Mathematics

Computer Science Section & Mathematics (326 R)

Tim & Points & Date: 3 Hours & 50 points

27 May 2019

==========

Answer the following equation

1) Factory makes two kinds of metal tanks A , B . Every kind passes in two machines. The first is to cut the sheet metal in 70 hours weekly, the second is for folding sheets in 60 hours weekly, The first kind "A" needs 4 hours in the first machine and 10 hours in the second machine. The second kind "B" needs 5 hours in the first machine and 6 hours in the second machine. Writ the model of the linear programming which makes the highest profit if the profit of "A" is 3 $ and the profit of "B" is 6 $.and solve the model by the Algebraic method. [10 points]

2) Find the Duality problem of the L.P.P , Use the graphical method to solve the D.P

$$Min \quad Z = 5x_1 + 8x_2$$

$$Subject\ to \quad x_1 + 2x_2 \geq 3 \ , \quad x_1 + 2x_2 \geq 2 \ , \quad and \quad x_1, x_2 \geq 0$$

[10 points]

3) If the solution of this model by simplex method

$$Max \quad Z = 3x_1 + 7x_2$$

$$S.t \quad 2x_1 + 8x_2 \leq 16 \ , \quad 2x_1 + 4x_2 \leq 8 \ , \quad x_1, \ x_2 \geq 0$$

[10 points]

See Next Page

is

Basic	x_2	x_2	x_2	x_2	solution
x_2	0	1	1/4	-1/4	2
x_1	1	0	-1/2	1	0
Z	0	0	1/4	5/4	14

Discuss Sensitivity Analysis

4) Use the Big – M Technique of simplex Method to solve

$Min\ Z = 3x_1 + 2x_2$

Subject to $x_1 - x_2 \le 2$, $2x_1 + 3x_2 \ge 6$, *and* $x_1, x_2 \ge 0$ [10 points]

5) Use the Tow phase Technique of simplex Method to solve

$Min\ Z = 3x_1 + 2x_2$

Subject to $x_1 + x_2 \ge 2$, $2x_1 + 3x_2 \le 4$, *and* $x_1, x_2 \ge 0$ [10 point]

With best wishes

Dr Mostafa el kateab

	Assiut University Faculty of Science Mathematics Dept.	Final Exam 2018-2019 Course: Mathematical and Statistical Packages Course code: MC300	Date: 30/5/2019 Level: Three Time: 2 Hours	

Question 1: Put *True* or *False* for each of the following items (30 points)

1. The second order of precedence is for exponentiation.
2. When referencing a cell on the same spreadsheet as the active cell the sheet name is not required.
3. Functions are pre-defined worksheet formulas.
4. Formulas in Excel must be written in a very specific format, referred to as system.
5. To select different "non-contiguous" areas of cells by holding down The Alt key while clicking and dragging.
6. The range **B2:F2** is a range down a column.
7. The contents of the active cell will also be displayed on the **formula bar.**
8. Formatted Display is the number of decimal places that appear in a cell.
9. The function **COUNTA(value1,[value2],...)** counts non-blank cells.
10. To reference a cell Absolutely with respect to Row and relatively with respect to Column we use this notation : D$2
11. The Average function ignore the blank cells.
12. Getting data from a cell located in a different sheet is called accessing.
13. The Increase/Decrease decimal buttons change a value and how the value is displayed.
14. Relational operators are always evaluated last
15. Formula values are automatically updated when a referenced value changes.
16. SPSS has only two windows Data view and Output view.
17. In SPSS the first column of variable view is Type.
18. In SPSS plant height 5.6 is an example of ordinal measurement.
19. In SPSS, to sort data select Data and then click Select Case.
20. Descriptive statistics are calculated using the Data menu.
21. Correlation is used to test the degree of association between variables.
22. To describe a continuous variable but at different levels of a categorical variable is called compare means.
23. SPSS is a Windows based program that can be used to perform data entry and analysis and to create tables and graphs.
24. SPSS is capable of handling large amounts of data.
25. **A cell** refers to the juncture of a specific row and column.
26. Variable name in SPPP must begin with a letter.
27. To filter data in SPSS choose Filter from data menu.

28. To compute new variable in SPSS choose new variable from Data menu.
29. To split the data file by sex select **View/Split file**.
30. A paired samples *t*-test is typically used to compare a sample mean to a known population mean.

Question 2: Answer the following questions (20 points)

1) Describe the SPSS layouts.

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2) Type in the variable types without details.

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3) What are the types of measurements?

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4) Write in details how to sort data in SPSS.

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5) What are the difference between Frequencies, Crosstabs and Compare means?

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Answer Sheet		
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Answer Sheet		
	True	False
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Faculty of Engineering
Assiut University
2nd Semester – Final Exam
June 2019

Microprocessor معالجات دقيقة

Mathematical Dept.
Time: 2 Hours
Marks: 50

Important remarks	• The Exam consists of **3 questions** Assume any missing data

Question no. 1 (18 points).

A- **Choose the correct answer (7 points)**

1- Atmega16 is considered a …….. bit Microcontroller

(a) 16	(b) 8	(c) 32	(d) 64

2- In a successive approximation ADC, if the conversion accuracy increased by one bit the quantization error will be reduced by

(a) 50%	(b) 25%	(c) 10%	(d) none of the above

3- The size of the EEPROM in Atmega16 is ….. byte

(a)512	(b) 16	(c) 32	(d) 256

4- The total number of input output PINS in Atmega16 is

(a) 16	(b) 8	(c) 32	(d) 64

5- the total number of External Interrupts (not including the RESET interrupt) available in Atmega16 is

(a) 3	(b) 1	(c) 5	(d) 64

6- The maximum number of counts possible when using Timer 0 in Atmega16 is

(a) 8	(b) 255	(c) 256	(d) 128

7- If a clock of rate equals 1024 Hz is passed through a prescaller unit with prescalling factor equals to 4 the output clock frequency will be

(a) 2048	(b)128	(c) 256	(d) 4000

B- (4 points) In your own words, describe when it is more preferable to use EEPROM to store data instead of other types of memories.

C- (3 points) What is the benefit of enabling the PULL UP resistor when a PIN direction is configured as input ?

D- (4 points) with the aid of sketch, describe the operation of 3-bit successive approximation analog to digital converter.

Question no. 2 (18 points).

A- (5 points) Write the required instruction to **clear** bits no. 1 ,5 and **set** bits no. 0, 7 in a register named REG without changing other bits (do not use any predefined functions or macros)

B- (5 point) In a certain scenario, an input pin connected to a push button is used for counting. However, each time the button is pressed the counter (using polling method as in the below code) count it more than one). Describe the problem and change the below code to solve it.

```
while (1) {
  If (PINA.0==1) // check if the button is pressed
      count++; } // increment the counter
```

C- (2 points) What is the purpose of the **#asm("sei")** instruction ?

D- (5 points) Write the required instructions to only initialize Timer/Counter 0 unit to count external pulses in negative edge in Clear Timer in Compare match (CTC) mode. The timer should trigger the corresponding interrupt when the number of pulses reaches 20.

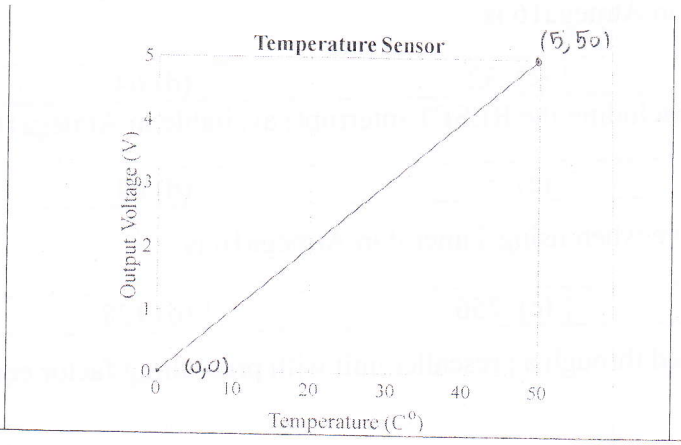
Question no. 3 (15 points). Write the C code for the below design

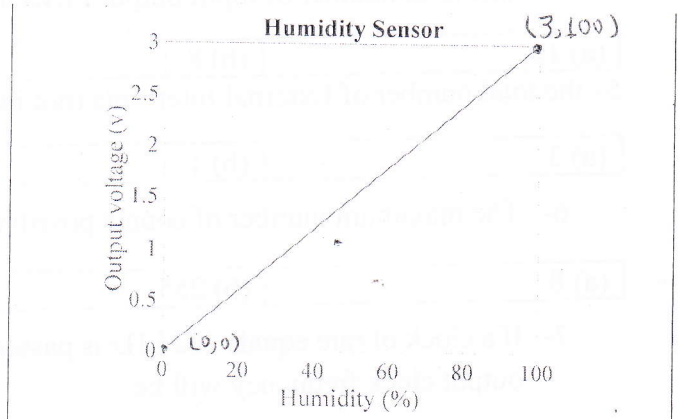
A- (15 point) It is required to design a simple temperature and humidity display unit using Atmega16, 16x2 LCD and temperature sensor (connected to PORTA.0) and humidity sensor (connected to PORTA.0). Every 5 seconds (calculated using Timer 0) the microcontroller read the analog voltage output of the two sensors sequentially and convert their value using ADC unit then display the current temperature and humidity on the LCD.

Note: 1- ADC unit use a AVCC (5 V) as its reference voltage

2- The relation between the temperature or humidity and voltage output is linear as in the graphs

3- The microcontroller clock frequency equals 2^{20} Hz





Timer/Counter Control Register – TCCR0

Bit	7	6	5	4	3	2	1	0	
	FOC0	WGM00	COM01	COM00	WGM01	CS02	CS01	CS00	TCCR0
Read/Write	W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	
Initial Value	0	0	0	0	0	0	0	0	

Table 38. Waveform Generation Mode Bit Description[1]

Mode	WGM01 (CTC0)	WGM00 (PWM0)	Timer/Counter Mode of Operation	TOP	Update of OCR0	TOV0 Flag Set-on
0	0	0	Normal	0xFF	Immediate	MAX
1	0	1	PWM, Phase Correct	0xFF	TOP	BOTTOM
2	1	0	CTC	OCR0	Immediate	MAX
3	1	1	Fast PWM	0xFF	TOP	MAX

Table 39. Compare Output Mode, non-PWM Mode

COM01	COM00	Description
0	0	Normal port operation, OC0 disconnected.
0	1	Toggle OC0 on compare match
1	0	Clear OC0 on compare match
1	1	Set OC0 on compare match

- **Bit 2:0 – CS02:0: Clock Select**

The three Clock Select bits select the clock source to be used by the Timer/Counter.

Table 42. Clock Select Bit Description

CS02	CS01	CS00	Description
0	0	0	No clock source (Timer/Counter stopped).
0	0	1	$clk_{I/O}$/(No prescaling)
0	1	0	$clk_{I/O}$/8 (From prescaler)
0	1	1	$clk_{I/O}$/64 (From prescaler)
1	0	0	$clk_{I/O}$/256 (From prescaler)
1	0	1	$clk_{I/O}$/1024 (From prescaler)
1	1	0	External clock source on T0 pin. Clock on falling edge.
1	1	1	External clock source on T0 pin. Clock on rising edge.

Timer/Counter Interrupt Mask Register – TIMSK

Bit	7	6	5	4	3	2	1	0	
	OCIE2	TOIE2	TICIE1	OCIE1A	OCIE1B	TOIE1	OCIE0	TOIE0	TIMSK
Read/Write	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	
Initial Value	0	0	0	0	0	0	0	0	

ADC Multiplexer Selection Register – ADMUX

Bit	7	6	5	4	3	2	1	0	
	REFS1	REFS0	ADLAR	MUX4	MUX3	MUX2	MUX1	MUX0	ADMUX
Read/Write	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	
Initial Value	0	0	0	0	0	0	0	0	

ADC Control and Status Register A – ADCSRA

Bit	7	6	5	4	3	2	1	0	
	ADEN	ADSC	ADATE	ADIF	ADIE	ADPS2	ADPS1	ADPS0	ADCSRA
Read/Write	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	
Initial Value	0	0	0	0	0	0	0	0	

Special FunctionIO Register – SFIOR

Bit	7	6	5	4	3	2	1	0	
	ADTS2	ADTS1	ADTS0	–	ACME	PUD	PSR2	PSR10	SFIOR
Read/Write	R/W	R/W	R/W	R	R/W	R/W	R/W	R/W	

```
interrupt [TIM0_OVF] void timer0_ovf_isr(void)        //Timer 0 overflow interrupt service routine
interrupt [TIM0_COMP] void timer0_comp_isr(void)      //Timer 0 output compare interrupt service routine
```

GOOD LUCK

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