جامعة طنطا — امتحان الفصل الدراسى الاول — المستوى : الثانى (علوم الحاسب والرياضيات)

كلية العلوم — 2015-2014 — المادة : جبر مجرد

(MA2103)

قسم الرياضيات — الزمن : ساعتان

Answer the following questions :.

1- A)Let X be a nonempty set. P(x) is the set of all subsets of X . If $\cap$ is the intersection operation on P(x) ,then discuss the algebraic properties of (P(x), $\cap$). (15 marks).

B) Let R be the set of all real numbers ,

$F = \{ f \mid f: R \to R \}$ is the set of all mappings on R .

Define the additive operation on F as follows:

$$(f + g)(r) = f(r) + g(r).$$

Show that (F;+) is an abelian group. (20 marks).

2- A) Let G be a group , $a \in G$. Define the centralizer of a , C(a), and show that it forms a subgroup of G . (15 marks).

B) Let $\rho = (1\ 2)(3\ 4\ 5) \in S_5$.

How many elements in S_5 are in the same cycle pattern as ρ?

Write down these elements .

How many elements in C(a)? Write down these elements.

(25 marks).

جامعة طنطا
كلية العلوم
قسم الرياضيات

امتحان الطلاب المستجدون – الفرقة الثانية علوم – حاسب

اسم المقرر : رياضيات متقطعة		كود المقرر: MA2107		
زمن الامتحان: ساعتان	الدرجة الكلية للامتحان: ١٠٠	الفصل الدراسي: الأول	يناير	التاريخ: ٦ - ١ - ٢٠١٥

Answer the following questions

Question 1 (25 Marks)

(1) Six boys and six girls are to be seated in a row, how many ways can they be seated if

(a) All boys are to be seated together and all girls are to be seated together (10 Marks)

(b) Boys occupy extreme positions (10 Marks)

(2) Show that $\sum_{k=0}^{n}(-1)^k \binom{n}{k} = 0$ (5 Marks)

Question 2 (25 Marks)

(1) Determine whether the sequence $\{a_n\}$ is a solution of the recurrence relation

$a_n = 2a_{n-1} - a_{n-2}$ for $n = 2, 3, 4, \ldots, where$

(1) $a_n = 5$ (2) $a_n = 2^n$ (10 Marks)

(2) Find the solution of the recurrence relation

$$a_n = 6a_{n-1} - 11a_{n-2} + 6a_{n-3}$$

with the initial conditions $a_0 = 2, a_1 = 5$, and $a_2 = 15$ (15 Marks)

Question 3 (25 Marks)

Let A={1,2,3,4,6,9} and R={(a,b): a < b, a divides b}. Compute R, R^2 and M_R. Sketch the digraph of R and find all paths of length 3.

Question 4 (25 Marks)

(1) Let P={{a,c}, {b,d}} be a partition on the set X={a,b.c,d}. Determine the corresponding equivalent R relation on X. (15 Marks)

(2) Consider U={1,2,3,4,5,6} and A={2,4,6}. Find the sequence corresponding the characteristic function f_A. (10 Marks)

الممتحنون:	أ.د/ عاطف عبد الجليل	د/ عبد المحسن بدوي

مع تمنياتي الجميع بالنجاح و التوفيق

	TANTA UNIVERSITY FACULTY OF SCIENCE - MATHEMAICS DEP.		
	EXAMINAION FOR SECOND YEAR STUDENT		BRANCH: STATISTICS
	COURSE TITLE: PROBABILITY THEORY (1)		TIME: 2 HOURS
DATE: 29/12/2014	TERM: FIRST	CODE: ST2101	

Answer the Following Questions Total (150 Marks)

1- A) If repetitions are not permitted, i) how many 3 digit numbers can be formed from the six digits 2,3,5,6,7 and 9? ii) How many of these are less than 400? iii) How many are even? iv) How many are odd? v) How many are multiple of 5?

B) In how many ways can 5 people be seated: i) in a row ii) in a circle? (30 Mark)

2- For the following p.d.f.:

$$f(x) = \begin{cases} \frac{3}{4}x(2-x) & 0 \le x \le 2 \\ 0 & otherwise \end{cases}$$

Find: i) $p(1 < x < 2)$ ii) E(2X+1) iii) The CDF (F(X)) (40 Mark)

3- If X is discrete random variable , its mean $E(X) = 3$ and its probability function is:

x	1	3	k	5
p(x)	$4m$	m	0.2	$3m$

(i)Calculate the values of **m** and **k**. (ii) Calculate the variance (σ^2) (iii) CDF (F(X))

(iv) Moment generating function $M_X(t)$ and from it prove that $E(X) = 3$.

(v) The coefficient of skewness β_1 and (vi) The coefficient of kurtosis β_2. (40 Mark)

4-If the joint p.f of X and Y is given by:

$$p(x,y) = \begin{cases} \frac{1}{4}\ C\ (2x+3y) & x = 0,1,2\ ,\ y = 1,2,3 \\ 0 & otherwise \end{cases}$$

Find: i) the value of C ii) $p(X = 2, Y = 1)$

iii) $p(X \ge 1, Y \le 2)$ iv) Marginals of X and Y (40 Mark)

With all my best Wishes
Dr. Wafaa Anwar

Tanta UNIVERSITY, Faculty of Science, Department of Botany				
EXAMINATION for freshmen (second Year) Students OF Chem./Micro				
	Coursetitle:	Prokaryotic organisms		Course Code: MB2101
Date: 3	January,2013	Term: First	Total assessment Marks: 150	Time allowed: 2 hours

Answer the following questions:-

Section 1

I - Choose the correct answer for each of the following: 22.5 Marks

1- The viruses are.....
a –saprophytic b – obligate parasitic c – facultative parasitic
d – symbiotic

2 - Which of the following methods are used for purification of viruses
a – salting out b – precipitation by alcohol c – ultracentrifugation
d – all

3 - Heterocyst present in.....
a – Oscillatoria b – Nostoc c – Viruses d – all

4 - Members of Cyanobacteria reproduce by .....
a - hormogonia b – akinetes c – endospores d – all

5 - False branching is characteristic of .....
a - *Scytonema* b- *Gloeotrichia* c - Nostoc d - *Anabaena*

6 - *Scytonema* usually reproduces by .....
a - hormogonia b - akinetes c - heterocysts d – endospores

7 - Mycophages infect .....
a – plants b – animals c – fungi d – algae

8 - Viruses multiply by .....
a - vegetative b – asexual c – sexual d – nothing

9 - The virus lose its infectivity by .....
a – ultra violet rays b – water c – alcohol d – ice

10-Plant viruses may be taken into animal cell by.....
a – insects b – plaque c - phagocytosis d – nothing

3- A) Let $\varphi: G \to H$ be a group homomorphism . If N is anormal subgroup of G ,Show that $\varphi(N)$ is normal in $\varphi(G)$. (15 marks).

B)(i) Consider the set of integers Z and the relation "congruence modulon" ($a \equiv b$ (modn) , a,b $\in$ Z and n $\in Z^+$).
Show that the relation is an equivalence relation.

(ii) Let Z_9 be the group of residue classes modula 9 . Determine a subgroup H of Z_9 , write the elements of the factor group $Z_9 \backslash H$. Discuss the algebraic properties of this group. (25 marks).

4- A) Consider D_5 (the dihedral group) as a permutation group of degree 5 ($D_5 \subseteq S_5$) . Write down the elements of the group and the corresponding orders. Determine a proper subgroup containing both even and odd permutations. (20 marks).

B) Consider the alternating group A_4 and the cyclic group $C_3 = \{w, w^2, w^3 = 1\}$.
If N = { (1)(2)(3)(4) , (1 2)(3 4) , (1 3)(2 4) , (1 4)(2 3) } is a normal subgroup of A_4 , and $\varphi : A_4 \to C_3$ is a nonzero group homomorphism in which ker φ = N ,then determine the image of each element in A_4.
(15 marks).

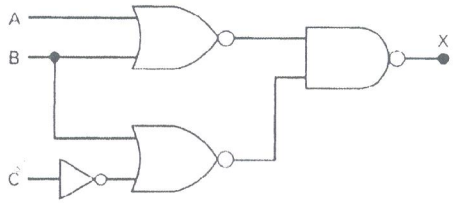
With Best Wishes

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF MATHEMATICS	
	EXAMINATION FOR (LEVEL TWO) STUDENTS OF COMPUTER SCIENSE	
	COURSE TITLE: COMPUTER SYSTEMS	COURSE CODE: CS2101
DATE: 13-1-2015	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

Answer the Following Questions:

QUESTION 1: [of total 50 marks]

1. Simplify the following expressions using De Morgan's theorems.
   a. $\overline{(M + \bar{N})(\bar{M} + N)}$
   b. $\overline{\bar{A} + \bar{C} + \bar{D}}$
2. How many bits are required to represent the decimal numbers in the range from 0 to 999 using straight binary code? Using BCD code?
3. Write the Boolean expression for output x in the following circuit. Determine the value of x for all possible input conditions, and list the values in a truth table.



QUESTION 2: [of total 50 marks]

1. Design a logic circuit using x_1 , x_0, y_1, and y_0 inputs, where output is 1 only when the two binary numbers x_1x_0 and y_1y_0 are equal such that: x_1x_0 resents a two-bit number that can have any value (00, 01,10, or 11). When $x_1=1$ and $x_0=0$, the binary number is 10, and so on. Similarly, y_1y_0 represent another two-bit binary number.
2. For each of the following find (with full steps) the lost number according to the associated radix.
   a. $(100100001001)_2$ = (.....)$_{10}$
   b. $(2313)_{10}$ = (.....)$_2$
   c. $(743)_8$ = (.....)$_{10}$
   d. $(771)_{10}$ = (.....)$_8$
   e. $(7FF)_{16}$ = (.....)$_{10}$
   f. $(314)_{10}$ = (.....)$_{16}$
   g. $(257)_8$ = (.....)$_{16}$
   h. $(37FD)_{16}$ = (.....)$_8$
3. List the hex numbers in sequence from 280_{16} to $2A0_{16}$.

QUESTION 3: [of total 50 marks]

1. How many bits are required to represent the decimal numbers in the range from 0 to 999 using straight binary code? Using BCD code?
2. Encode the decimal numbers 6727 and 888 in BCD. Convert the BCD numbers (1001011101010010) and (0111011101110101) to decimal.
3. Simplify the following expressions using both Boolean algebra and K map.
   a. $x = \bar{A}\bar{B}\bar{C} + \bar{A}BC + ABC + A\bar{B}\bar{C} + A\bar{B}C$
   b. $y = \overline{(C + D)} + \bar{A}C\bar{D} + A\bar{B}\bar{C} + \bar{A}\bar{B}CD + AC\bar{D}$
4. Represent the statement: Y = 5/X in ASCII code. Attach an odd-parity bit and give the result in hex. [use the following ASCII code]

Character	Seven-bit ASCII	Character	Seven-bit ASCII
X	101 1000	=	011 1101
Blank	010 0000	5	011 0101
/	010 1111	Y	101 1001

EXAMINERS	DR. MOSAAD WAJEH HASSAN	DR/ MAGDY ALI SERWAH
	DR.	DR/

With best wishes

Tanta University
Faculty of Science
Mathematics Department
(Computer Science Deviation)

File Systems Final Term Exam (2nd year)

2014-2015	First Term	Time Allowed: 2 Hours

Solve the following questions

Question 1:

a. Compare between logical and physical files?
b. Why do we use files?
c. List the important parameters which distinguish hard disk from another?

Question 2:

Consider the following disk specifications: Number of platters = 80, Number of track/surface=200, Number of sector/track = 100 and Sector size=512 byte. Additionally, consider a file F1 of size 37 Kbyte and file F2 of size 375 byte.

a. Compute the track, surface, cylinder, platter and disk capacities?
b. How many sectors we need to store both files assume sector base organization?
c. If the cluster consists of 8 sectors, how many clusters we need to store both files assume cluster base organization?
d. If the average seek time = 30 msec. and rotational time = 200 msec. compute access time in both sector and cluster organization in case of:
   1. Randomly access.
   2. Sequential access.

Question 3:

a. What are the differences between sequential search and direct access?
b. List advantages and disadvantages of data compression?
c. Mention the strategies for record deletion?
d. Mention placement strategies for new records?

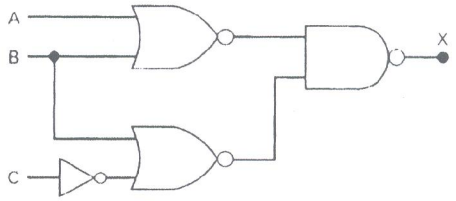
Good luck

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF MATHEMATICS	
	EXAMINATION FOR (LEVEL TWO) STUDENTS OF COMPUTER SCIENSE	
	COURSE TITLE: COMPUTER SYSTEMS	COURSE CODE: CS2101
DATE: 13-1-2015	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

Answer the Following Questions:

QUESTION 1: [of total 50 marks]

1. Simplify the following expressions using De Morgan's theorems.
   a. $\overline{(M + \bar{N})(\bar{M} + N)}$
   b. $\overline{\bar{A} + \bar{C} + \bar{D}}$
2. How many bits are required to represent the decimal numbers in the range from 0 to 999 using straight binary code? Using BCD code?
3. Write the Boolean expression for output x in the following circuit. Determine the value of x for all possible input conditions, and list the values in a truth table.



QUESTION 2: [of total 50 marks]

1. Design a logic circuit using x_1 , x_0, y_1, and y_0 inputs, where output is 1 only when the two binary numbers x_1x_0 and y_1y_0 are equal such that: x_1x_0 resents a two-bit number that can have any value (00, 01,10, or 11). When $x_1=1$ and $x_0=0$, the binary number is 10, and so on. Similarly, y_1y_0 represent another two-bit binary number.
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   b. $(2313)_{10} = (\ldots\ldots\ldots\ldots)_2$
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3. List the hex numbers in sequence from 280_{16} to $2A0_{16}$.

QUESTION 3: [of total 50 marks]

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4. Represent the statement: Y = 5/X in ASCII code. Attach an odd-parity bit and give the result in hex. [use the following ASCII code]

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X	101 1000	=	011 1101
Blank	010 0000	5	011 0101
/	010 1111	Y	101 1001

EXAMINERS	DR. MOSAAD WAJEH HASSAN	DR/ MAGDY ALI SERWAH
	DR.	DR/

With best wishes

Tanta University
Faculty of Science
Department of Mathematics

Examination for :	Second level - Statistics		
Course Title: Computer Programing (2)		Course Code:	CS2103
Time: 4/1/2015	Term: First	Total Assessment Marks: 150 M	Time Allowed: 2H

Answer the following questions:

(30 marks)

[1] (a) What are function prototypes? What is their purpose? Where within a program are function prototypes normally placed, and what is the general form?

(b) Write a C program that will read a single lowercase character, converted it to uppercase, where within a program the function utilizes the **if-else** statement.

(45 marks)

[2] (a) What is the Recursion? What conditions have to be satisfied in order to solve a problem recursively? Write a C program for calculating the factorial of a given integer, using a recursive function.

(b) A normally distributed random variable x, with mean μ and a standard deviation σ, can be generated from the formula: $x = \mu + \sigma\left(\sum_{i=1}^{N} r_i - (N/2)/\sqrt{N/12}\right)$, where r_i is a uniformly distributed random number whose value lies between 0 and 1. For N=12, write a C program that will generate a specified number of the normal distribution with a given mean and standard deviation.

(45 marks)

[3] (a) How is the automatic variable defined? What is the difference between the external and the static variables? What is the difference between array and variable?

(b) write a Complete C program that will find the value of x which causes the function: $f(x) = x \cos x$, to be maximized within a specified interval.

(30 marks)

[4] (a) State 10 major differences between C and C++? How is the pointer defined? Which are the pointers closely associated with? Which does it mean dynamic memory allocation?

(b) Explain the meaning of each of the following: int *p; & int *p[10]; & double *p(void); & int p(char(*a)[ ]); & int p(char *a[ ]); & float* pv=NULL; & double fun(float *a, int *b);.

With best wishes
Dr. K.M. El-Morabie

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF MATHEMATIC			
	EXAMINATION FOR FRESHMEN (SECOND YEAR) STUDENTS OF MATHEMATICS.			
	COURSE TITLE:	MATHEMATICAL ANALYSIS 1		COURSE CODE:MA2105
DATE:	DECEMBER, 2014	TERM: FIRST	TOTAL ASSESSMENT MARKS:150	TIME ALLOWED: 2 HOURS

أجب عن الاسئلة الاتية:-

السؤال الاول :- ا- ادرس اتصال الدالة التالية عند نقطة الاصل

$$f(x,y)=\begin{cases}(x^2+y^2)\sin\dfrac{1}{x^2+y^2} & ,if\,(x,y)\neq(0,0)\\ 0 & ,if\,(x,y)=(0,0)\end{cases}.$$

ب - اذا كانت f دالة فى u,v وكانت $u=\dfrac{x^2}{y}$, $v=\dfrac{y^2}{x}$ فبرهن على ان

$$x^2 f_{xx}-y^2 f_{yy}=3(u^2 f_{uu}-v^2 f_{vv})$$

السؤال الثانى :- اختر الاجابة الصحيحة من بين الاقواس

١-المعادلة التفاضلية هى (معادلة تحتوى على تفاضلات كلية – معادلة تحتوى على مجهول تحت علامة التفاضل والمجهول دالة فى متغيرين- معادلة تحتوى على مجهول تحت علامة التفاضل – معادلة تحتوى على تفاضلات جزئية) .

٢- اتصال الدوال دات متغيرين يعنى ان (الدالة معرفة عند نقطة ونهايتها المزدوجة موجودة - النهاية المزدوجة موجودة وتساوى قيمة الدالة عند نقطة ما – الدالة معرفة عند نقطة ما وقيمة النهاية المزدوجة عند نفس النقطة موجودة – النهاية المزدوجة عند نقطة ما تساوى قيمة الدالة عند نفس النقطة) .

٣- التكامل الثنائى عبارة عن (حجم اسطوانة قاعدتها Δs_1 وارتفاعها $f(p_1)$ - نهاية حجم اسطوانة قاعدتها Δs_1 وارتفاعها $f(p_1)$ - مجموع حجوم السطوانات الاولية قاعدتها Δs_i وارتفاعها $f(p_i)$ - نهاية مجموع حجم الاسطوانات الاولية قاعدتها Δs_i وارتفاعها $f(p_i)$) .

٤- المعادلة $ay''+by'+cy=0$ من النوع (خطية من الرتبة الاولى – خطية من الرتبة الثانية- خطية من الرتبة الثانية دات العوامل الثابتة – خطية من الرتبة الثانية دات العوامل المتغيرة) .

السؤال الثلث:- أ- بدل الترتيب فى التكامل الثنائى ثم عين قيمتة $\int_0^3 \int_{\frac{4}{3}x}^{\sqrt{25-x^2}} dy\,dx$.

ب- اوجد المعادلة التفاضلية التى يكون حلها العام $y=ce^x$.

السؤال الرابع :- صف المعادلات التفاضلية الاتية ثم اوجد الحل العام

1) $y'=\dfrac{x^2+y^2+x}{xy}$,

2) $y'=\dfrac{y}{x}+\tan\dfrac{y}{x}$,

3) $y'+2y=y^2e^x$.

EXAMINERS	PRO. DR. M. BELTAGY	Pro. DR .H. K. EL- SAYIED

Tanta University, Faculty of Science | TIME DURATION: 2h

SUBJECT: **Computer Programming** | CODE: CS2103

LEVEL 2 (Mathematics-Statistics-Computer) | SEMESTER 1, 2013 - 2014

Answer the following questions

QUESTION 1:

(i) What is **recursion**? What conditions have to be satisfied in order to solve a problem recursively? Write a **C** program that will read in a line of text on a character-by-character basis, and then display the characters in reverse order.

(ii) Write a complete **C** program that will read in a line of text, sort it in a one-dimensional character array, and then analyze the individual array elements. In particular, count the number of vowels, consonants, digits, whitespace characters, and "other" characters.

QUESTION 2:

(i) Write a complete **C** program that will find the value of x which causes the function:

$$y = x \cos x$$

to be maximized within a specified interval.

(ii) Write an interactive **C** program that will read two tables of integers into the computer, calculate the sums of the corresponding elements, and then display the new table containing these sums.

QUESTION 3:

(i) What are function prototypes? What is their purpose? Where within a program are function prototypes normally placed and what is their general form?

(ii) How is an automatic variable defined and initialized? What happens if it is not explicitly initialized? Does it retain its value once control is transferred out of its defining function?

(iii) Discuss what does it mean by "multifile programs allow greater flexibility in defining the scope of both functions and variables"?

(iv) When are array declarations required in a **C** program? How do such declarations differ from array definitions? How can a portion of an array be passed to a function?

(v) Explain the meaning of each of the following: static float digits [6] = {2., 0, −0.3}; & char color [ ] = "RED"; & double *funct (float *a, double *b, int *c);.

With my best wishes

Tanta University

Faulty of science

Mathematics Department

Subject : File Structures

Time : 2 H

Date : 2 -1- 2014

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1. Define

- File Structures
- Data compression
- Transfer Time
- Record
- File manger
- extent

2. Given the following data

- *Tape characteristics*
  - Tape density = 6250 byte per inch
  - Tape speed = 200 inches per second (ips)
  - Size of inter block gap = 0.3 inch
- *File characteristics:*
  - Number of records = 1,000,000
  - Size of record = 100 bytes

How much tape length is needed when a) Blocking factor = 1 and b) Blocking factor = 50

3. State advantage and disadvantage of Data compression then compress the following sentence using Huffman coding

"I AM SAMMY "

4. Compare between several Placement Strategies from AVAIL list (A list of the space, freed through record deletion)

Then solve the following problem :

AVAIL LIST size=10 ,size=50 ,size = 22 ,size= 60 Which record from AVAIL LIST used to store new record of size 20 using several Placement Strategies

5. State true or false

A. A primary key is a key that is used to identify uniquely a record

B. If a file contains variable-length records, the RRN (relative record number) can be used to calculate the byte offset of a record.

C. Wasted space within a record is called INTERNAL FRAGMENTATION.

D. Magnetic tape is a direct access storage devices

E. Capacity is the measure of the amount of time required by a storage device to retrieve data and programs.

F. Fixed-length records may contain variable-length fields.

Good luck Dr / ahmed Samak

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF MATHEMATICS			
	EXAMINATION FOR 2ND YEAR MATH AND COMPUTER SCIENCE			
	COURSE TITLE: DISCRETE MATH			COURSE CODE:
DATE:	JAN 2014	TERM: FIRST	TOTAL ASSESSMENT MARKS:	TIME ALLOWED: 2 HOURS

Answer FOUR questions from the following

Question 1

a) Let A = { p , q , r }. Give the regular set corresponding to the regular expression given:
(i) $(p \vee q)\, r\, q^*$ (ii) $P(q\,q)^*\, r$

b) Prove that divisibility " I " is a partial order relation on the set of positive integers Z^+

c) Sketch the Hasse diagram of the poset (A , I), where A = {1, 2, 3, 6, 9, 18}

Question 2

a) Determine if the given statement is True or False. Explain your resonning:
   i. A non-empty finite poset has a maximal element
   ii. A non-empty finite poset has a greatest element
   iii. A non-empty finite poset has a minimal element
   iv. A non-empty finite poset has a least element

b) Let A = {1, 2, 3, 4, 5} and let M_R and M_S be the Boolean matrices of the relations R and S on A. Compute M_{R^2} , M_{SoS} and M_{RoS}

$$M_R = \begin{bmatrix} 1 & 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 0 & 0 \\ 1 & 0 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 0 \\ 0 & 1 & 1 & 1 & 1 \end{bmatrix} \quad , \quad M_S = \begin{bmatrix} 1 & 0 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 0 \\ 1 & 0 & 1 & 0 & 0 \\ 0 & 1 & 1 & 1 & 1 \\ 1 & 0 & 0 & 0 & 1 \end{bmatrix}$$

c) In how many ways can six men and six women be seated in a row if
   i. Any person may sit next to other
   ii. Men and women must occupy alternate seats

Question 3

a) How many ways can you choose three of seven fiction books and two of six non-fiction books to take with you on your vacation?

b) Let $A = \{0, 1\}$. Give a recurrence relation for the number of strings of length n in A^* that do not contain 0 1.

c) Let $P = \{ \{1, 3, 5\}, \{2, 4\} \}$ be a partition on the set $A = \{1, 2, 3, 4, 5\}$. Determine the corresponding equivalence relation R on A. Sketch the digraph of R and find its Boolean matrix.

Question 4

a) Solve he recurrence relations:

$c_n = -6\, c_{n-1} - 9\, c_{n-2}$; with the initial condition

$c_1 = 2.5$, $c_2 = 4.7$

b) Find an explicit formula for the sequence defined by the recurrence relation

$c_n = c_{n-1} + n$ with initial condition $c_1 = 4$

c) Find all maximal and minimal elements of the poset $A = \{2, 3, 4, 6, 8, 24, 48\}$ with the partial order of divisibility. Use the Algorithm SORT to produce a linear order on the set A.

Question 5

a) Let R be the relation whose matrix is

$$M_R = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 \\ 1 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 1 \end{bmatrix}$$

Find the reflexive closure and symmetric closure of R.

b) Show that if seven colors are used to paint 50 bicycles, at least eight bicycles will be the same color.

c) Let $(A, \leq)$ be a partial order set. Prove that a subset B of A has at most one LUB and at most one GLB.

EXAMINERS	DR./ SANAA EL ASSAR	DR/
	DR/	DR/

With my best wishes

مع تمنياتي للجميع بالنجاح و التوفيق