جامعه طنطا

كليه العلوم

قسم الرياضيات

اختبار نهائى لطلاب كليه العلوم الفرقه الثانيه شعب :احصاء رياضى +حاسب +رياضيات

الماده : نظريه الاحتمالات 1	كود الماده :ST2101	التاريخ :دور يناير سنه 2018
الفصل الدراسى : الاول	الدرجه :150 درجه	الزمن : ساعتان

اجب عن الاسئله الاتيه

السؤال الاول : ضع احدى العلامتين √ او X لكل من العبارات الاتيه : (ثلاثون درجه)

1) العزم الأول لمتغير عشوائى حول الصفر يساوى القيمه المتوقعه لهذا المتغير
2) عند القاء عمله حتى ظهور الكتابه فان فضاء العينه الذى يمثل عدد مرات القاء العمله يسمى لانهائى معدود
3) القيمه المتوقعه لمقدار ثابت مضروبا في متغير يساوى مربع الثابت مضروبا في القيمه المتوقعه لهذا المتغير
4) المتغير العشوائى المتصل ياخذ جميع القيم فى مجال تغيره
5) القيمه المتوقعه والتباين لمتغير عشوائى يتبع التوزيع الاسى غيرمتساويتان
6) التباين لمقدار ثابت يساوى المقدار الثابت
7) عدد عناصر فراغ الاحتمالات اكبر من عدد عناصر فراغ الاحداث لتجربه عشوائيه
8) داله الكثافه الاحتماليه لمتغير عشوائى تساوى تكامل داله التوزيع التراكميه لهذا المتغير
9) العزم الثانى لمتغير عشوائى حول القيمه المتوقعه يساوى صفر
10) التفاضل الثالث للداله المولده للعزوم يعطى العزم الثالث حول الصفر

السؤال الثانى : (ثلاثون درجه)

أ)اختر الاجابه الصحيحه فى كل مما ياتى

1) القيت عمله متجانسه ثلاث مرات,فان احتمال (ظهور الصوره على الأقل مره او عدم ظهور الصوره) يساوى ($3/8$,$7/8$,3^0 ,$1/8$)
2) اذا كان عدد عناصر فراغ الاحداث لتجربه عشوائيه 8 فان عدد عناصر فراغ الاحتمالات لهاهو (2^3,3^0 , 2^0,3)

ب) لاى حدثين A ,B اثبت ان : $P(A\cup B)=P(A)+P(B)-P(A\cap B)$

السؤال الثالث : (ثلاثون درجه)

ا) اثبت ان توزيع بواسون هو نهايه التوزيع الثنائى

ب)زهره نرد متجانسه القيت مره واحده احسب احتمال ظهور عدد يقبل القسمه على 2و3

السؤال الرابع : (ثلاثون درجه)

1)احسب القيمه المتوقعه والتباين لمتغير عشوائى يتبع التوزيع الاسى

2)اشرح بالتفصيل كيف تحسب داله الاحتمال لمتغير عشوائى يتبع التوزيع الثنائى

السؤال الخامس :(ثلاثون درجه)

أ) كيس يحتوى على 5 كرات حمراء ,ثلاث كرات بيضاء واخر يحتوى على2 حمراويتان ,6 كرات بيضاء . سحب احد الكيسين عشوائيا وسحبت منه كره عشوائيا احسب احتمال ان تكون الكره المسحوبه حمراء

ب) اوجد التباين لمتغير عشوائى يتبع التوزيع المنتظم

===

وحدة ضمان الجودة
كلية العلوم - جامعة طنطا
QUALITY ASSURANCE UNIT
FACULTY OF SCIENCE - TU

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF MATHEMATICS			
	FINAL TERM EXAM FOR FIRST TERM 2017-2018			
1969	COURSE TITLE:	Abstract and Linear Algebra		COURSE CODE:MA2103
DATE:	JANUARY, 2018	TERM: FIRST	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

Answer the following questions :

(Abstract Algebra)

Question 1 (40 marks)

a-Prove that every cyclic group is abelian, but the converse is not true in the general case. (10 marks)

b- Consider the set $G = \{1, -1, i, -i\}, i = \sqrt{-1}$, with multiplication operation ".". Prove that $(G,.)$ is a cyclic group, and find the order and the inverse of each element in G.

(15 marks)

c- (i) Write the permutation $\sigma = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 3 & 5 & 6 & 1 & 8 & 4 & 7 & 2 \end{pmatrix}$ as a product of disjoint cycles.

(ii) Is σ even or odd permutation?

(iii) Find the inverse of σ. (15 marks)

Question 2 (35 marks)

a- Prove that in a group G,

(i) $\forall a \in G, (a^{-1})^{-1} = a,$

(ii) The identity element is unique and the inverse of any element is unique. (10 marks)

b- Let G be a group, H is a subgroup of G, prove that $aH = bH$ if and only if $a^{-1}b \in H$ ($b^{-1}a \in H$) (15 marks)

c- Let G be a group, $g \in G$ and a is a fixed element of G. Prove that the mapping

$\varphi_a : G \to G$

$g \to a^{-1}ga$

is a homomorphism. (10 marks)

P.T.O.

وحـــدة ضمــان الجــودة
كلية العلوم - جامعة طنطا
QUALITY ASSURANCE UNIT
FACULTY OF SCIENCE - TU

TANTA UNIVERSITY

FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS

EXAMINATION FOR PROSPECTIVE STUDENTS (2^{ND} YEAR) STUDENTS OF MATHEMATICS

COURSE TITLE: Abstract Algebra		COURSE CODE: MA2103	
DATE: 1/1/2017	TERM:FIRST	TOTAL ASSESSMENT MARKS:150	TIME : 2 HOUR

Answerthe following questions:

Question 1(40) Let G be a group with identity e. Prove that

1- Ghas a unique identity.

2- $(abc)^{-1} = c^{-1}b^{-1}a^{-1}, \forall a, b, c \in G$

3- $G$is an abelian group if and only if$a^2 = e, \forall\, a \in G$.

4- For every $a, b \in G,$ the equation $ax = b$ has a unique solution in$G$.

Question 2(40)

(a) Let H and K are two subgroups of a group G. Verify each of the following

1- HK is a subgroup of G if and only if $HK = KH$.

2- For $a, b \in G, aH = bH$ if and only if $a^{-1}b \in H$.

3- H is normal subgroup of G if and only if $aH = Ha, \forall a \in G$.

(b) State and prove Lagrange's Theorem. Apply Lagrange's Theorem to assign all subgroups of the symmetric group $S_3$and draw the lattice all subgroups of S_3. Determine normal subgroups of S_3.

Question 3(30)

(a) Discuss: There is one to one correspondence between the set of normal subgroups of a group G and the set of homomorphisms with domain G.

(b) Let G_1, G_2 are groups. Prove that$G = G_1 \times G_2$ is a group. Find two subgroups H, K of G such that $G = HK$ and $H \cap K = \{e\}$.

Question 4(40)

(a) Let $f: G \to G_1$ be a homomorphism of groups$G$andG_1. Prove that

(1) $f(a^{-1}) = \big(f(a)\big)^{-1}, \forall\ a \in G.$

(2) $f(e) = e_1$, where $e, e_1$are the identitiesof $, G_1$, respectively.

(3) $H \lhd G$implies $f(H) \lhd f(G)$.

(b) State and prove the first isomorphism Theorem of groups.

EXAMINERS	PRO. DR./MOHAMED KAMLGABR	DR./ABD EL-MOHSEN BADAWY

With our best wishes

٣

TANTA UNIVERSITY

FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS

EXAMINATION FOR PROSPECTIVE STUDENTS (2^{RD} YEAR) STUDENTS OF MATHEMATICS

COURSE TITLE: Abstract Algebra	COURSE CODE: MA2103

DATE: 1/1/2017	TERM:FIRST	TOTAL ASSESSMENT MARKS:150	TIME : 2 HOUR

Answerthe following questions:

Question 1(40) Let G be a group with identity e. Prove that

1- Ghas a unique identity.

2- $(abc)^{-1} = c^{-1}b^{-1}a^{-1}, \forall a, b, c \in G$

3- $G$is an abelian group if and only if$a^2 = e, \forall\, a \in G$.

4- For every $a, b \in G$, the equation $ax = b$ has a unique solution in$G$.

Question 2(40)

(a) Let H and K are two subgroups of a group G. Verify each of the following

1- HK is a subgroup of G if and only if $HK = KH$.

2- For $a, b \in G, aH = bH$ if and only if $a^{-1}b \in H$.

3- H is normal subgroup of G if and only if $aH = Ha, \forall a \in G$.

(b) State and prove Lagrange's Theorem. Apply Lagrange's Theorem to assign all subgroups of the symmetric group $S_3$and draw the lattice all subgroups of S_3. Determine normal subgroups of S_3.

Question 3(30)

(a) Discuss: There is one to one correspondence between the set of normal subgroups of a group G and the set of homomorphisms with domain G.

(b) Let G_1, G_2 are groups. Prove that$G = G_1 \times G_2$ is a group. Find two subgroups H, K of G such that $G = HK$ and $H \cap K = \{e\}$.

Question 4(40)

(a) Let $f: G \to G_1$ be a homomorphism of groups$G$andG_1. Prove that

(1) $f(a^{-1}) = \left(f(a)\right)^{-1}, \ \forall\ a \in G$.

(2) $f(e) = e_1$, where $e, e_1$are the identitiesof , G_1, respectively.

(3) $H \lhd G$implies $f(H) \lhd f(G)$.

(b) State and prove the first isomorphism Theorem of groups.

EXAMINERS	PRO. DR./MOHAMED KAMLGABR	DR./ABD EL-MOHSEN BADAWY

With our best wishes

TANTA UNIVERSITY

FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS

EXAMINATION FOR PROSPECTIVE STUDENTS (2^{RD} YEAR) STUDENTS OF MATHEMATICS

COURSE TITLE: Abstract Algebra			COURSE CODE: MA2103	
DATE: 1/1/2017		TERM:FIRST	TOTAL ASSESSMENT MARKS:150	TIME : 2 HOUR

Answerthe following questions:

Question 1(40) Let G be a group with identity e. Prove that

1- Ghas a unique identity.

2- $(abc)^{-1} = c^{-1}b^{-1}a^{-1}, \forall a, b, c \in G$

3- $G$is an abelian group if and only if$a^2 = e, \forall\, a \in G$.

4- For every $a, b \in G,$ the equation $ax = b$ has a unique solution in$G$.

Question 2(40)

(a) Let H and K are two subgroups of a group G. Verify each of the following

1- HK is a subgroup of G if and only if $HK = KH$.

2- For $a, b \in G, aH = bH$ if and only if $a^{-1}b \in H$.

3- H is normal subgroup of G if and only if $aH = Ha, \forall a \in G$.

(b) State and prove Lagrange's Theorem. Apply Lagrange's Theorem to assign all subgroups of the symmetric group $S_3$and draw the lattice all subgroups of S_3. Determine normal subgroups of S_3.

Question 3(30)

(a) Discuss: There is one to one correspondence between the set of normal subgroups of a group G and the set of homomorphisms with domain G.

(b) Let G_1, G_2 are groups. Prove that$G = G_1 \times G_2$ is a group. Find two subgroups H, K of G such that $G = HK$ and $H \cap K = \{e\}$.

Question 4(40)

(a) Let $f: G \to G_1$ be a homomorphism of groups$G$andG_1. Prove that

(1) $f(a^{-1}) = \left(f(a)\right)^{-1}, \forall\ a \in G$.

(2) $f(e) = e_1$, where $e, e_1$are the identitiesof $, G_1$, respectively.

(3) $H \lhd G$implies $f(H) \lhd f(G)$.

(b) State and prove the first isomorphism Theorem of groups.

QUALITY ASSURANCE UNIT
FACULTY OF SCIENCE - TU

EXAMINERS	PRO. DR./MOHAMED KAMLGABR	DR./ABD EL-MOHSEN BADAWY

With our best wishes

DEPARTMENT OF MATHEMATICS
TANTA UNIVE RSITY
FACULTY OF SCIENCE
(Computer Science Division)

EXAMINATION FOR PROSPECTIVE STUDENTS (2ND YEAR)

COURSE TITLE: Programming II برمجة الحاسب . COURSE CODE: CS2103

DATE:16-1-2018 | JAN 2018 | TERM: 1 | TOTAL ASSESSMENT MARKS: 150 | TIME ALLOWED: 2 HOURS

Answer the following Questions:

Question 1: (50 marks)

- How to describe the two dimensional array, Give an example? How to initialize the two dimension array by characters, integer and float? How to deal with it inside the main function?
- Write a program for a school has 5 classes every class have 20 students, how to calculate the average of their degrees?
- How to write a program using project, describe in detail how to do that using the two different methods? What the difference between Break and Continue inside for loop, give examples?

Question 2: (50 marks)

- What is the definition of structure, write its form? What is the difference between structure and Union? Give an example for that? What is the deference between macro and function?
- Define the arrays of structures with an example? What is it means structure of structure with example?
- Describe the three main component of any Function? Can you describe the four main types of functions with examples? What does it means recursive function, write example?

Question 3: (50 marks)

- How to pass structures to function and return from it? give an example (This mean, how individual structure members can be passed to a function as arguments and how a single structure member can be returned via the return statement).
- Write a structure with int and float members; and names with 10 characters? How to describe and use the member of structure inside the main function, give example?
- Write the two types of files? Describe the four major operations to deal with the file? How to read from file or write in file, write two examples for that?

EXAMINERS	PROF. DR./ ATLAM ELSAYED	DR/RASHA ELAGAMY

With my best wishes

انتهت الأسئلة .... مع أطيب الأماني والتوفيق

ضمان الجودة
QUALITY ASSURANCE UNIT
FACULTY OF SCIENCE - TU