

TANTA UNIVERSITY		FACULTY OF SCIENCE		DEPARTMENT OF MATHEMATICS	
EXAMINATION FOR JUNIORS (SECOND YEAR) STUDENTS OF STATISTICS					
COURSE TITLE: Mathematical Statistics		COURSE CODE: ST2208		DATE: 19 MAY, 2018	
TERM: SECOND		TOTAL ASSESSMENT MARKS: 150		TIME ALLOWED: 2 HOURS	

Answer the Following Questions:

Total Mark: 150

Q1. The following data describes the ages for some people, calculate the Mean (\bar{X}), the Median (M) and the Mode (M^*) for these data.

Ages classes	Frequency
20-	25
25-	40
30-	50
35-	35
40-	30
50-60	20

(37 Mark)

Q2. Let X be a random variable with CDF as:

$$F(x) = \begin{cases} 0 & x < 0 \\ x & 0 \leq x < 0.25 \\ x + 0.5 & 0.25 \leq x < 0.5 \\ 1 & x \geq 0.5 \end{cases}$$

- 1) Plot $F(x)$ and explain why X is a mixed random variable.
 2) Find: $P\left(x \leq \frac{3}{4}\right)$, $P\left(x \geq \frac{1}{4}\right)$.
 3) Find $E(X), V(X)$.

Q3. (i) If X has a Poisson distribution $p(x) = \frac{e^{-\lambda} \lambda^x}{x!}$, $x = 0, 1, 2, \dots$, Find the moment generating function and then find $E(X)$ and $V(X)$. Moreover, If X_1 and X_2 are independent Poisson random variables with parameters λ_1, λ_2 respectively. What is the distribution of $X_1 + X_2$.

(ii) How many 4 digit numbers can be formed with the 10 digits 0, 1, 2, 3, ..., 9 if

(a) Repetitions are allowed, (b) Repetitions are not allowed,

(c) The last digit must be zero and repetitions are not allowed?

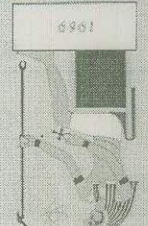
Q4. Consider the following time series data:

Week	1	2	3	4	5	6	7
Sales	39	44	40	45	38	43	39

a- Develop a three moving average for this time series. What is the forecast for week 8?
 b- Compute the MAD, MSE and MAPE for the three-week moving average.

With all my best wishes

EXAMINERS	PROF. DR. MOHAMED AB EL HADY	DR. WAFAA ANWAR ABD EL LATIF
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		Mathematics Department, Faculty of Science, Tanta University	Sub-branch: Computer Science	Branch: Math. Dept.
		Examination for: Level two	Term: second Term 2017-2018	Course Code: MA2220
Date: 26/5/2018	Total Mark: 150 marks	Time Allowed: 2 Hours		

Linear Algebra (75 marks)

Answer the following questions:

Question 3 (40 marks):

a) Prove that the vectors $(1, 1)$ and $(-1, 2)$ form a basis of R^2 .

(15 marks)

b) Prove that the following mapping is a linear mapping.

(15 marks)

$$F: R^2 \rightarrow R^2, F(x, y) = (x + y, x), \forall (x, y) \in R^2.$$

c) Write the vector $v = (1, -2, 5)$ as a linear combination of the vectors

(10 marks)

$$e_1 = (1, 1, 1), e_2 = (1, 2, 3), e_3 = (2, -1, 1).$$

Question 4 (35 marks):

a) Find the eigenvalues and the eigenvectors for the matrix $A = \begin{pmatrix} 1 & 1 \\ -2 & 4 \end{pmatrix}$.

(15 marks)

b) Consider the vector space $R^3 = \{(a, b, c) : a, b, c \in R\}$ over the field R .

Prove that the subset $U = \{(a, b, 0) : a, b \in R\}$ is a subspace of R^3 . (10 marks)

c) Prove that the vector $a_1 = (1, 2, 1)$ and $a_2 = (3, 1, 5)$ of the space

(10 marks)

$V = R^3$ are linearly independent.

with our Best Wishes

Examiners

أ.د/ أحمد رضا اللوموري

د/ فاطمة عبد الله حسن

انظر أسئلة الخبز الخطي في الخلف

(١٠ درجة) $2x + 2y - z - 3 = 0$, $x - 2y - 2z - 1 = 0$ يتقاطعان على التمام.

(ج) اثبت ان المستويين

(١٥ درجة) $x^2 + y^2 + z^2 + 4x - 6y + 4z - 8 = 0$

(ب) اوجد نصف قطر و مركز الكرة التي معادلتها على الصورة

(١٠ درجة) $2x^2 - 3y^2 - 2z^2 - 8x + 6y - 12z = -21$ يمثل مجسم ذي طية واحدة و اوجد مركزه.

(ا) اثبت ان السطح الذي يكون معادله

السؤال الثاني (٣٥ درجة):

(١٥ درجة) $B = (1, 1, 2)$ و $A = (1, 2, -3)$ اذا كان \vec{A} و \vec{B} قاعد مسقط المتجه A على المتجه B ، ثم اوجد طول هذا المسقط و الزاوية بين المتجهين \vec{A}

(ج) اوجد مسقط المتجه A على المتجه B ، ثم اوجد طول هذا المسقط و الزاوية بين المتجهين \vec{A} و \vec{B} اذا كان $B = (1, 1, 2)$ و $A = (1, 2, -3)$

(١٠ درجة) اوجد معادله المستوي على الصورة $3x + 2y - z + 5 = 0$ التي معادله المستوي في الصورة العمودية ثم اوجد طول العمود المسقط من نقطة الاصل على المستوي.

(ب) حول المعادله العامة للمستوي التي على الصورة

(١٥ درجة) $3x - y + 2z - 5 = 0$

مع المستوي

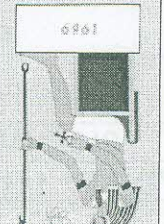
$$\frac{x-1}{2} = \frac{y+1}{3} = \frac{z-1}{-2}$$

(ا) اوجد نقطة تقاطع الخط المستقيم

السؤال الاول (٤٠ درجة):

اكتب عن الاسئلة التالية:

(٧٥ درجة) هلوسة مجسمة

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