(دمج . ش) Arab Republic of Egypt ثان / E (٥/١٨٠٥)

Ministry of Education

General Secondary Education Certificate Examination – Second Session 2020

[Third Year Secondary]

Statistics Time: 1 ½ Hours

الإحصاء (بالإنجليزية) الدور الثاني ٢٠٢٠ (الإجابة فى نفس كراسة الأسئلة)

تنبيه مهم : يسلم الطالب كراسة امتحانية باللغة العربية مع الكراسة المترجمة (الأسئلة فى ٨ صفحات)

Calculator is allowed

Answer the following questions:

First: choose the correct answer from those given:

(1) If A and B are two events of the sample space of a random experiment (S) such that: $\subset B$, then $P(B|A) =$ ……

(a) P(A) (b) P(B) (c) P(A - B) (d) P(S)

(2) If A and B are two independent events of the sample space of a random experiment such that: $P(A) = 0.5$, $P(B) = 0.6$,then $P(A \cup B) =$….

(a) 0.3 (b) 0.7 (c) 0.8 (d) 0.1

(بقية الاسئلة في الصفحة الثانية)

(3) Two players A , B shoot at a target at the same time. If the probability that A hits the target is 0.4 and the probability that B hits the target is 0.25, then the probability that the target is hit equals …….

(a) 0.75 (b) 0.65 (c) 0.55 (d) 0.5

(4) If X is a random variable, its mean (μ) = 20, its standard deviation (σ) = 2, then the coefficient of variation = ……%

(a) 1 (b) 100 (c) 1000 (d) 10

(بقية الاسئلة في الصفحة الثالثة)

(5) If the regression line equation is : $\hat{y} = 3 - x$, then the correlation the values of x and the values of y is ……

(a) nihilistic (b) direct (c) perfect inverse (d) perfect direct

(6) If X is a discrete random variable whose range is { 0 , 1 , 2 } such that

P (x = 0) = 0.2 , P (x = 1) = 0.4 , then: P (x = 2) = ……..

(a) 0.6 (b) 0.5 (c) 0.4 (d) 0.2

(7) The strongest inverse correlation coefficient of the following is: ……..

(a) - 0.2 (b) - 0.5 (c) - 0.7 (d) - 0.8

(بقية الاسئلة في الصفحة الرابعة)

Second: Answer the following questions:

(1) A box contains 7white balls, 8 red balls and 5 black balls, two balls are chosen one after the other at random without replacement:
What is the probability that:
(I) the second ball is white if the first ball is white?
(II) the first ball is red, and the second ball is red?

Complete:

(I) the probability that the second ball is white if the first ball is white

= ……

= ……

(II)) the probability that the first ball is red and the second ball is red

= …… × ……

= ……

(2) If $\sum x = 60$, $\sum y = 70$, $\sum x^2 = 406$, $\sum y^2 = 536$, $\sum xy = 374$, $n = 10$
Find the linear correlation coefficient between the two variables x and y and determine its type.

Solution:

$$r = \frac{n \sum xy - \ldots\ldots\ldots\ldots}{\sqrt{\ldots\ldots - \ldots\ldots}\ \sqrt{\ldots\ldots - \ldots\ldots}}$$

$$r = \frac{\ldots\ldots\ldots\ldots - \ldots\ldots\ldots\ldots}{\sqrt{\ldots\ldots - \ldots\ldots}\ \sqrt{\ldots\ldots - \ldots\ldots}}$$

$$r = \frac{\ldots\ldots\ldots\ldots}{\sqrt{\ldots\ldots}\ \sqrt{\ldots\ldots}} = \ldots\ldots$$

The type of correlation is ……..

(بقية الاسئلة في الصفحة الخامسة)

(3) If X is a discrete random variable, its probability distribution is as follows:

X_r	0	1	2	3	4
$f(X_r)$	0.4	k	0.1	0.1	0.1

Find : (first) the value of k

(second) the mean and the standard deviation for the variable X

Solution:

(first) the value of k =……..

(second) to determine the mean and the standard deviation

X_r	$f(X_r)$	$X_r \cdot f(X_r)$	$X^2{}_r \cdot f(X_r)$
0	0.4	…….	…….
1	…..	…….	…….
2	0.1	…….	…….
3	0.1	…….	…….
4	0.1	…….	…….
Sum	…..	…….	…….

The mean μ = …….……

The variance σ^2 = ……

The standard deviation σ = …….

(بقية الاسئلة في الصفحة السادسة)

(4) If X is a discrete random variable whose probability distribution is determine by the function $f(x) = \frac{x+2}{k}$ such that $x = 1, 2, 3$

Find: (first) the value of k (second) the expectation μ

Complete:

(first) *to find the value of* k

$f(1) =$ .....

$f(2) =$ .....

$f(3) =$ .....

$\because f(1) + f(2) + f(3) = 1$

$\therefore$ ..... + ... + ... =1

$\therefore k =$ .....

(second) *to find the expectation* μ

x_r	$f(x_r)$	$x_r \times f(x_r)$
1	.....	.....
2	.....	.....
3	.....	.....
sum		.....

The expectation $\mu =$ .....

(بقية الاسئلة في الصفحة السابعة)

(5) If A and B are two events of the sample space of a random experiment such that $P(A) = 0.4 , P(B) = 0.5 , P(A \cup B) = 0.8$

Find : First: $P(A \cap B)$ Second : $P(A \mid B)$

Solution:

First: $P(A \cap B) =$ …… + …… - ……

= …… + …… - ……

= ……

Second : $P(A \mid B) = \frac{\text{.....}}{\text{.....}}$

$= \frac{\text{.....}}{\text{.....}}$

= ……

(بقية الاسئلة في الصفحة الثامنة)

(6) Complete to determine Spearman's rank correlation coefficient between X and Y and determine its type

X	Y	ranks of X	ranks of Y	D	D^2
3	7	……..	……..	……..	……..
1	4	……..	……..	……..	……..
6	5	……..	……..	……..	……..
4	8	……..	……..	……..	……..
3	6	……..	……..	……..	……..
8	7	……..	……..	……..	……..
					……..

r = 1 - $\frac{\text{.....}}{\text{.....}}$

= 1 - .....

= ..... $\simeq$ .....

Its type is .....

(إنتهت الاسئلة)