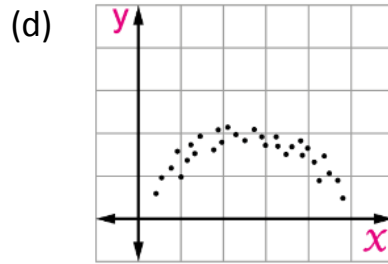
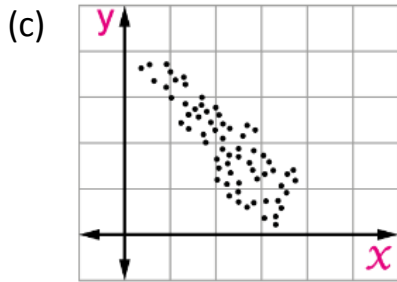
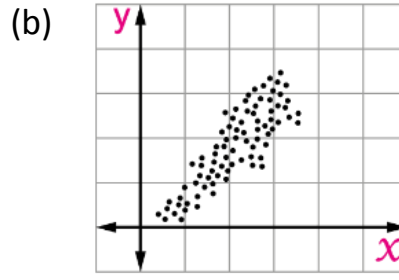
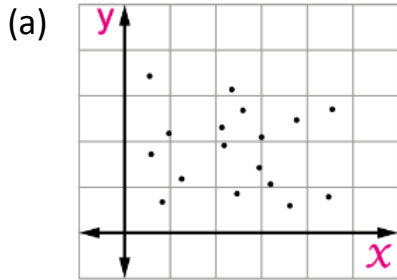


نموذج (٤) لامتحان شهادة إتمام الدراسة الثانوية العامة ٢٠٢٥ / ٢٠٢٦ م

المادة: الإحصاء باللغة الإنجليزية (الشعبة الأدبية – رياضيات) الزمن: ثلاث ساعات

First: Multiple Choice questions (1 mark for each question) :

(1) The scatter diagram which represents inverse correlation between x , y is



(2) In the scatter diagram between the two variables x , y , if all the points belong to a straight line of positive slope , then the correlation between x and y is.....

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

(3) the following data represents the marks of 11 students in a monthly test, represented in a stem-and-leaves plot, assuming that the maximum score is 30. If the range of this data equals 19, then $n = \dots\dots\dots$

stem	leaves
n	n n 4 5
2	n n 1 3
3	0 0 0

The key 3 | 0 represents 30

- (a) Zero (b) 1 (c) 11 (d) 13

(4)	If the following box-plot illustrates the distribution of scores for a group of students in the Mathematics examination , then the second quartile =						
(a)	7	(b)	20	(c)	26	(d)	34

(5)	If Z is a standard normal random variable, then $P(Z < 1.6) = \dots\dots\dots$						
(a)	0.8904	(b)	0.4370	(c)	0.4115	(d)	0.4573

(6)	If A , B are two mutually exclusive events from the sample space of a random experiment and $P(A) = 0.6$, then $P(A - B) = \dots\dots\dots$						
(a)	0.1	(b)	0.3	(c)	0.6	(d)	0.9

(7)	If A , B are two events from the sample space of a random experiment, $P(A) = \frac{1}{3}$, $P(B) = \frac{3}{8}$ and $P(A \cup B) = \frac{11}{24}$, then: $P(A \setminus \cup B \setminus) = \dots\dots\dots$						
(a)	$\frac{1}{4}$	(b)	$\frac{13}{24}$	(c)	$\frac{3}{4}$	(d)	$\frac{1}{12}$

(8)	If μ is the mean of the normal random variable X, then: $P(X \leq \mu) = \dots\dots\dots$						
(a)	0.1587	(b)	0.3413	(c)	0.5	(d)	0.8413

(9)	If X is a normal random variable with mean μ and a standard deviation $\sigma = 6.4$, and $P(X > 68) = 0.1056$, then: $\mu = \dots\dots\dots$						
(a)	20	(b)	40	(c)	50	(d)	60

(10)	The size of a sample is 225, using the confidence level 95%, and the estimation of error is 0.784, then the standard deviation of the sample equals						
(a)	5	(b)	6	(c)	25	(d)	36

Second: Multiple choice questions (2 marks for each question)

(11)	In a statistical study of the relation between the two variables x, y , if $\sum D^2 = 40$, $n = 6$, then the Spearman's correlation coefficient between the two variables x and y =						
(a)	$-\frac{1}{7}$	(b)	$\frac{1}{7}$	(c)	$\frac{2}{7}$	(d)	$-\frac{2}{7}$

(12)	If the equation of the regression line is $\hat{y} = 8 + \frac{3}{4}x$, then the error in y when $x = 12$ is given that its table value = 14.						
(a)	2	(b)	3	(c)	5	(d)	7

(13)	If X is a random variable following a geometric distribution and $P(X = 1) = 0.5$, then the expectation =						
(a)	5	(b)	4	(c)	3	(d)	2

(14)	The following data represents the weights of 10 gold items (measured in grams weight). If the data is represented by a stem-and-leaves, then the first quartile =		<table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr> <th style="border-right: 1px solid black; padding: 5px;">stem</th> <th style="padding: 5px;">leaves</th> </tr> </thead> <tbody> <tr> <td style="border-right: 1px solid black; text-align: center;">1</td> <td style="text-align: center;">4 5 6 7 8</td> </tr> <tr> <td style="border-right: 1px solid black; text-align: center;">2</td> <td style="text-align: center;">3 4 5</td> </tr> <tr> <td style="border-right: 1px solid black; text-align: center;">3</td> <td style="text-align: center;">1 1</td> </tr> </tbody> </table>		stem	leaves	1	4 5 6 7 8	2	3 4 5	3	1 1
stem	leaves											
1	4 5 6 7 8											
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3	1 1											
		The key 1 4 represents 1.4										
(a)	15.75	(b)	1.575	(c)	0.1575	(d)	2.565					

(15)	If a coin is tossed twice and the upper face is observed, then the range of the random variable X which represents the number of times that tails appears =						
(a)	{ 1 , 2 }	(b)	{ 0 , 1 , 2 }	(c)	{ 1 }	(d)	{ 2 }

(16)	If A, B are two events from the sample space of a random experiment, and $P(A) = 0.4, P(B) = 0.7, P(A \cup B) = 0.8$, then: $P(A^c B) =$						
(a)	$\frac{3}{7}$	(b)	$\frac{1}{7}$	(c)	$\frac{5}{7}$	(d)	$\frac{4}{7}$

(17)	If the confidence interval for a sample mean is] 9.02, 10.98 [and the standard deviation of the sample equals 4 at a 95% confidence level, then the sample size equals						
(a)	30	(b)	49	(c)	225	(d)	64

(18)	To study the relation between two variables x , y , if $\Sigma x = 120$, $\Sigma y = 100$, $n = 40$, the equation of the regression line of y on x is $\hat{y} = m x + 0.7$, then the value of $m = \dots\dots\dots$						
(a)	0.4	(b)	0.5	(c)	0.6	(d)	0.7

(19)	<p>The following box plot illustrates the distribution of scores for a group of students in the statistics examination ,</p> <p>then the semi-interquartile range + the middle quartile =</p>						
(a)	47.5	(b)	72.5	(c)	97.5	(d)	62.5

(20)	If A , B are two independent events from the sample space of a random experiment, and $P (A) = 0.4$, $P (B) = 0.25$, then: $P (A \cup B) = \dots\dots\dots$						
(a)	0.1	(b)	0.5	(c)	0.55	(d)	0.6

(21)	If A , B are two events from the sample space of a random experiment, and $P (A) = 0.6$, $P (B) = 0.5$, $P (A \cup B) = 0.7$, then the probability of occurring only one of the two events is						
(a)	0.3	(b)	0.4	(c)	0.5	(d)	0.8

(22)	A bag contains 7 blue balls and 3 red balls. If two balls are drawn one after another without replacement, then the probability that the first ball is red and the second ball is blue =						
(a)	$\frac{7}{30}$	(b)	$\frac{2}{15}$	(c)	$\frac{7}{15}$	(d)	0.21

(23)	<p>If the following box plot illustrates the cultivated area in thousands acres in 25 villages in two different years ,</p> <div style="text-align: center;"> </div> <p>then the semi-interquartile range for the first year + semi-interquartile range for the second year =</p>						
(a)	15	(b)	30	(c)	45	(d)	60

(24)	<p>If X is a random variable and the expectation = 4, $\sum x_r^2 \times f(x_r) = 36.5$, then the coefficient of variation \simeq..... %</p>						
(a)	19.5	(b)	40.5	(c)	32.5	(d)	113.2

(25) If the number of hours that 11 students spend using the internet weekly is as follows : 14 , 35, 27 , 21 , 20 , 40 , 31 , 18 , 44 , 40 , 31 , which of the following diagrams is the stem-and-leaf plot that represents this data?

<p>(a)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="border-right: 1px solid black;">stem</th> <th>leaves</th> </tr> </thead> <tbody> <tr> <td style="border-right: 1px solid black; text-align: center;">1</td> <td style="text-align: center;">1 4 8</td> </tr> <tr> <td style="border-right: 1px solid black; text-align: center;">2</td> <td style="text-align: center;">0 1 7</td> </tr> <tr> <td style="border-right: 1px solid black; text-align: center;">3</td> <td style="text-align: center;">2 4 5</td> </tr> <tr> <td style="border-right: 1px solid black; text-align: center;">4</td> <td style="text-align: center;">0 4</td> </tr> </tbody> </table> <p style="text-align: center;">The key 3 4 represents 34</p>	stem	leaves	1	1 4 8	2	0 1 7	3	2 4 5	4	0 4	<p>(b)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="border-right: 1px solid black;">stem</th> <th>leaves</th> </tr> </thead> <tbody> <tr> <td style="border-right: 1px solid black; text-align: center;">1</td> <td style="text-align: center;">4 8</td> </tr> <tr> <td style="border-right: 1px solid black; text-align: center;">2</td> <td style="text-align: center;">0 1 7</td> </tr> <tr> <td style="border-right: 1px solid black; text-align: center;">3</td> <td style="text-align: center;">1 1 5</td> </tr> <tr> <td style="border-right: 1px solid black; text-align: center;">4</td> <td style="text-align: center;">0 0 4</td> </tr> </tbody> </table> <p style="text-align: center;">The key 3 5 represents 35</p>	stem	leaves	1	4 8	2	0 1 7	3	1 1 5	4	0 0 4
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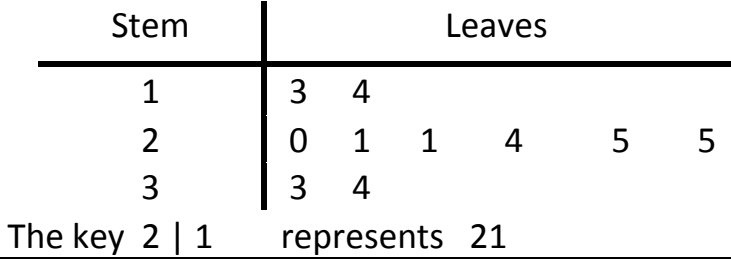
(26) The size of a sample is 100, and its standard deviation is 12, then by using a confidence level of 95%, the estimation of the error equals

- | | | | |
|---------|-----------|-----------|----------|
| (a) 2.5 | (b) 2.352 | (c) 0.235 | (d) 0.96 |
|---------|-----------|-----------|----------|

(27) If the equation of the regression line is $\hat{y} = 0.8x + 6$, then the expected value of y when $x = 5$ is

- | | | | |
|-------|-------|-------|--------|
| (a) 4 | (b) 6 | (c) 8 | (d) 10 |
|-------|-------|-------|--------|

(28) If the data represented in a stem-and-leaves plot represents the ages of 10 persons visiting a club in a certain day, then the second quartile =



- | | | | |
|----------|----------|----------|----------|
| (a) 12.5 | (b) 17.5 | (c) 22.5 | (d) 27.5 |
|----------|----------|----------|----------|

(29) A box contains 5 red balls and 7 black balls. Two balls are drawn consecutively (without replacement). The probability that the second ball is black given that the first ball is red =

- | | | | | | | | |
|-----|----------------|-----|----------------|-----|----------------|-----|----------------|
| (a) | $\frac{7}{11}$ | (b) | $\frac{7}{12}$ | (c) | $\frac{5}{11}$ | (d) | $\frac{5}{12}$ |
|-----|----------------|-----|----------------|-----|----------------|-----|----------------|

(30) If X is a random variable following a binomial distribution $X \sim B(n, 0.4)$ and the expectation = 8, then the value of n =

- | | | | | | | | |
|-----|----|-----|----|-----|----|-----|----|
| (a) | 10 | (b) | 20 | (c) | 40 | (d) | 60 |
|-----|----|-----|----|-----|----|-----|----|

(31) To study the relation between the two variables x and y , if: $\sum x = 220$, $\sum y = 140$, $\sum x^2 = 5486$, $\sum y^2 = 2292$, $\sum xy = 2658$, and $n = 10$, then the Pearson's correlation coefficient between the variables x and $y \approx$

- | | | | | | | | |
|-----|-------|-----|-------|-----|-------|-----|-------|
| (a) | - 0.9 | (b) | - 0.8 | (c) | - 0.7 | (d) | - 0.6 |
|-----|-------|-----|-------|-----|-------|-----|-------|

(32) If X is a continuous random variable and its probability density function is:

$$f(x) = \begin{cases} a + \frac{1}{8}x, & \text{where } 0 \leq x \leq 4 \\ \text{Zero} & , \text{ otherwise} \end{cases}$$
then the value of a =

- | | | | | | | | |
|-----|---------------|-----|---------------|-----|---------------|-----|------|
| (a) | $\frac{1}{4}$ | (b) | $\frac{3}{4}$ | (c) | $\frac{1}{8}$ | (d) | Zero |
|-----|---------------|-----|---------------|-----|---------------|-----|------|

(33) If X is a normally random variable with mean μ and standard deviation σ , then $P(X > \mu + \sigma) =$

- | | | | | | | | |
|-----|-----|-----|--------|-----|--------|-----|--------|
| (a) | 0.5 | (b) | 0.3413 | (c) | 0.1587 | (d) | 0.8413 |
|-----|-----|-----|--------|-----|--------|-----|--------|

Third : Essay Questions "2 marks for each question "

(34) If X is a discrete random variable with the following probability distribution:

x_r	1	2	3	4
$f(x_r)$	0.2	0.3	0.3	0.2

Calculate the standard deviation of the random variable X .

(35) If the upper limit of the confidence interval for a sample mean equals 31.96, the mean of the sample equals 30, and the standard deviation of the sample equals 7 at a confidence level of 95%, then find the sample size.