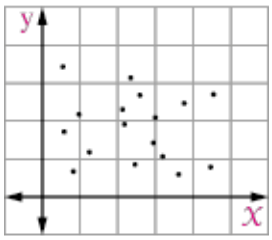
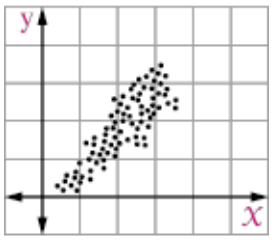
نموذج استرشادى (٣) لامتحان شهادة إتمام الدراسة الثانوية العامة ٢٠٢٥ / ٢٠٢٦ م

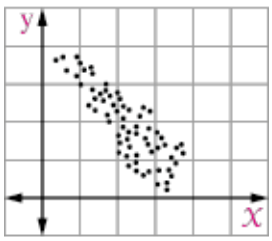
المادة : الإحصاء باللغة الإنجليزية (الشعبة الأدبية) الزمن : ثلاث ساعات

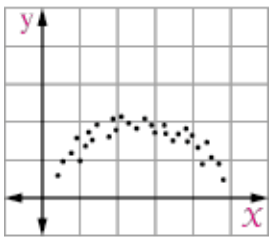
First: Multiple Choice questions (1 mark for each question)

(1) The scatter diagram represents a direct relationship between x and y is .....

(a) 

(b) 

(c) 

(d) 

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

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

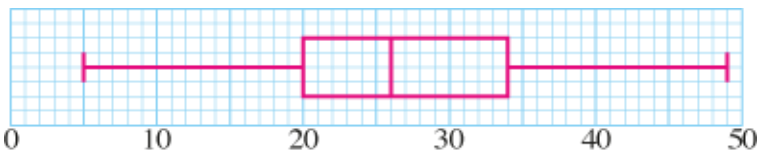
(3) The following data represents the scores of 11 students in a monthly test, represented in a stem-and-leaf plot, considering that the final score is 30. If the range of this data is equal to 19, then m = ...

Stem	Leaves
m	m m 4 5
2	m m 1 3
3	0 0 0

The key 3 | 0 represents 30

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

(4) The following box-plot illustrates the distribution of grades for a group of students in the mathematics examination:



then the semi interquartile range = ...

(a)	7	(b)	20	(c)	26	(d)	34

(5)	If Z is a standard normal random variable, then P(|Z| < 1.53) = ...						
(a)	0.8740	(b)	0.4370	(c)	0.4115	(d)	0.4573

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

(7)	If A and B are two events from the sample space of a random experiment, and $P(A) = \frac{1}{3}$, $P(B) = \frac{3}{8}$, $P(A \cap B) = \frac{1}{4}$, then: $P(A^{\setminus} \cap B^{\setminus})$ = ...						
(a)	$\frac{11}{24}$	(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 $P(X \leq \mu)$ = ...						
(a)	0.1587	(b)	0.3413	(c)	0.5	(d)	0.8413

(9)	If X is a normal random variable with a mean μ = 50 and a standard deviation σ, given that P(X < 33) = 0.0446, then σ = ...						
(a)	10	(b)	20	(c)	30	(d)	50

(10)	The size of a sample is 144, and its standard deviation is 1.2, using a confidence of level 95%, then the estimation error equals.....						
(a)	0.12	(b)	2.96	(c)	1.96	(d)	0.196

Second: Multiple Choice questions (2 mark for each question)

(11)	To study the relationship between the variables $\mathcal{X}$ and y, if: $\sum D^2 = 8.5$, n = 6, then the spearman's correlation coefficient between the variables $\mathcal{X}$ and y $\simeq$						
(a)	0.76	(b)	1	(c)	0.24	(d)	zero

(12)	If the regression line equation is $\hat{y} = 8 + \frac{3}{4}x$, then the error in y when $x = 8$ if the tabulated value = 12 is						
(a)	2	(b)	3	(c)	5	(d)	7

(13)	If X is a random variable following a geometric distribution and P(X= 1) = 0.2, then the expectation = ...						
(a)	3	(b)	4	(c)	5	(d)	6

(14)	If the following data represents the weights of 10 gold items (measured in grams weight) if the data is represented by using the stems-and-leaves plot, then the third quartile = ...						
(a)	25	(b)	2.55	(c)	26.5	(d)	2.65

Stem	Leaves
1	4 5 6 7 8
2	3 4 5
3	1 1

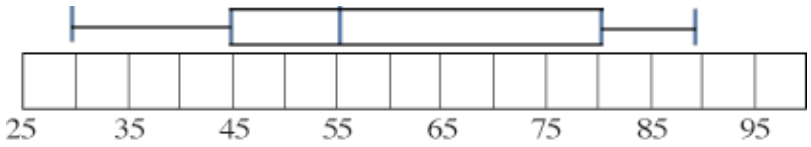
The key 1|4 represents 1.4

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

(16)	If A and B are events from the sample space of a random experiment, and if P(A) = 0.75, P(B) = 0.625, P(A ∪ B) = 0.875, then: $P(A^{\setminus} \mid B)$ = ...						
(a)	0.6	(b)	0.8	(c)	0.2	(d)	0.1

(17)	A study was carried out on a sample of female students regarding their pulse rate. Given that the sample size is 64, the standard deviation of the population of female students σ = 3.6, and the sample mean $\bar{x}$ = 18.4,then the confidence interval for the mean is ..... given that the confidence level is 95%.		
(a)	] 17.518 , 19.282 [	(b)	] 16.568 , 17.383 [
(c)	] 15.518 , 17.282 [	(d)	] 17.17 , 18.19 [

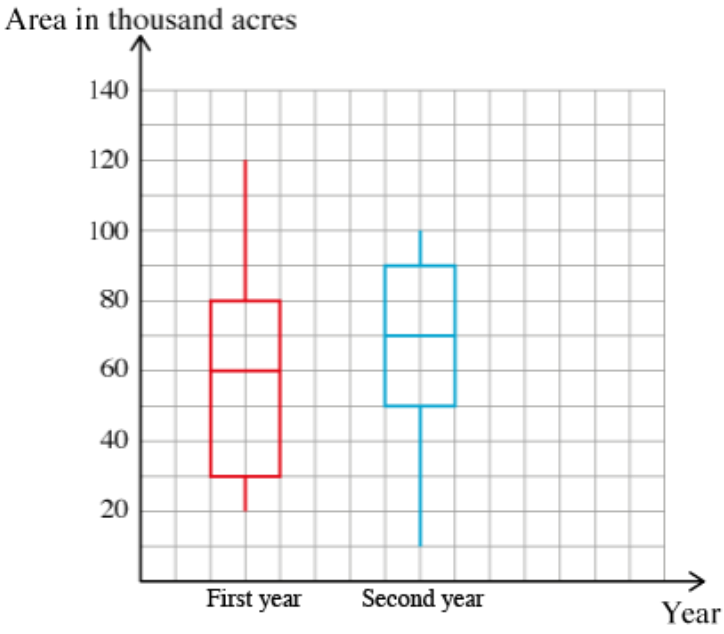
(18)	In studying the relationship between two variables x and y, if ∑ x = 316, ∑ y = 237, and n = 8, and the equation of the regression line of y on x is $\hat{y}$ = k x + 1.22, then the value of k ≃						
(a)	– 0.719	(b)	– 0.519	(c)	0.519	(d)	0.719

(19)	The following box plot illustrates the distribution of grades for a group of students in the statistics examination:  The semi-interquartile range = ...						
(a)	10	(b)	17.5	(c)	45	(d)	55

(20)	If A and 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 - B) = ...						
(a)	0.1	(b)	0.2	(c)	0.3	(d)	0.4

(21)	If A and B are two events from the sample space of a random experiment, and if P(A) =0.6, P(B) = 0.5, $P(A' \cup B') = 0.7$, then the probability of occurring at least one of the two events = ...						
(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 the other without replacement, the probability that the first ball is blue and the second ball is red = ...						
(a)	$\frac{7}{33}$	(b)	$\frac{7}{30}$	(c)	$\frac{4}{33}$	(d)	$\frac{4}{11}$

(23)	If the following box plot illustrates the area cultivated in acres in 25 villages in two different years:  Then the semi-interquartile range of the first year + the semi-interquartile range of the second year = ...						
(a)	20	(b)	25	(c)	45	(d)	50

(24)	If X is a random variable and the expectation = 3, $\sum x_r^2 \times f(x_r) = 14.5$, then the coefficient of variation ≃						
(a)	150.3%	(b)	150%	(c)	78%	(d)	183.3%

(25) If the number of hours 11 students spent using the internet weekly is as follows:

14, 35, 27, 21, 20, 40, 31, 18, 44, 40, 31

which of the following stem-and-leaf plots represents this data?

(a)

Stem	Leaves		
1	4	4	8
2	0	1	7
3	2	4	5
4	0	4	

The key 3 | 4 represents 34

(b)

Stem	Leaves		
1	4	8	
2	0	1	7
3	1	1	5
4	0	0	4

The key 3 | 5 represents 35

(c)

Stem	Leaves		
1	1	1	2
2	1	1	5
3	0	1	1
4	0	3	

The key 3 | 0 represents 30

(d)

Stem	Leaves		
1	1	1	2
2	0	1	1
3	2	4	8
4	0	3	

The key 3 | 8 represents 38

(26)	The size of a sample is 25, if its standard deviation is 10, using a confidence level of 95%, then the estimation error equals						
(a)	5.2	(b)	3.92	(c)	0.784	(d)	0.98

(27)	If the equation of the regression line is $\hat{y} = \frac{1}{2}x + 6$, then the expected value of y when $x = 4$ is						
(a)	2	(b)	4	(c)	6	(d)	8

(28)	If the data represented in the stem-and-leaf plot represents the ages of 10 persons attending a club on a certain day, then: the lower quartile – the third quartile = ...						

Stem	Leaves
1	3 4
2	0 1 1 4 5 5
3	3 4

The key 2 \| 1 means 21

(a)	– 8.5	(b)	– 0.85	(c)	8.5	(d)	0.85

(29)	A box contains 5 red balls and 7 black balls. Two consecutive balls are drawn (without replacement),the probability that the second ball is red given that the first ball is black = ...						
(a)	$\frac{7}{12}$	(b)	$\frac{6}{11}$	(c)	$\frac{5}{11}$	(d)	$\frac{5}{12}$

(30)	If X is a random variable following a binomial distribution X ~ B (n, S) with an expectation of 8 and a variance of $\frac{20}{3}$, then the value of n = ...						
(a)	48	(b)	56	(c)	64	(d)	32

(31)	To study the relationship between the two variables x and y, if $\sum x = 160$, $\sum y = 170$, $\sum x^2 = 4882$, $\sum y^2 = 5244$, $\sum x\, y = 4993$, and n = 6, then the Pearson's correlation coefficient between the variables x and y $\simeq$						
(a)	– 0.98	(b)	– 0.89	(c)	0.891	(d)	0.896

(32)	If X is a continuous random variable and its probability density function is: $F(x) = \begin{cases} a\,x & , \quad 2 \leq x \leq 6 \\ zero & , \ otherwise \end{cases}$, then the value of a = ...						
(a)	$\frac{1}{16}$	(b)	$\frac{1}{12}$	(c)	$\frac{1}{6}$	(d)	$\frac{1}{2}$

(33)	If X is a normally distributed random variable with mean μ and standard deviation σ, then P(X > μ + 0.8 σ) = ...						
(a)	0.2881	(b)	0.2119	(c)	0.4641	(d)	0.7881

Third: Essay Questions "2 marks for each question"

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

x_r	1	2	4	m
$f(x_r)$	0.2	0.3	0.4	0.1

Calculate the value of m if the expectation is 3, then calculate the standard deviation of the random variable X.

(35) If the upper limit for the confidence interval for a sample mean is 15.98, the mean of the sample is 15, and the standard deviation of the sample is 16 at a confidence level of 95%, then find the sample size.