General Mathematics

Paper 1

General instruction

- Work in this book will not be marked.

Section 1

• Respond to these questions in the question and response book.

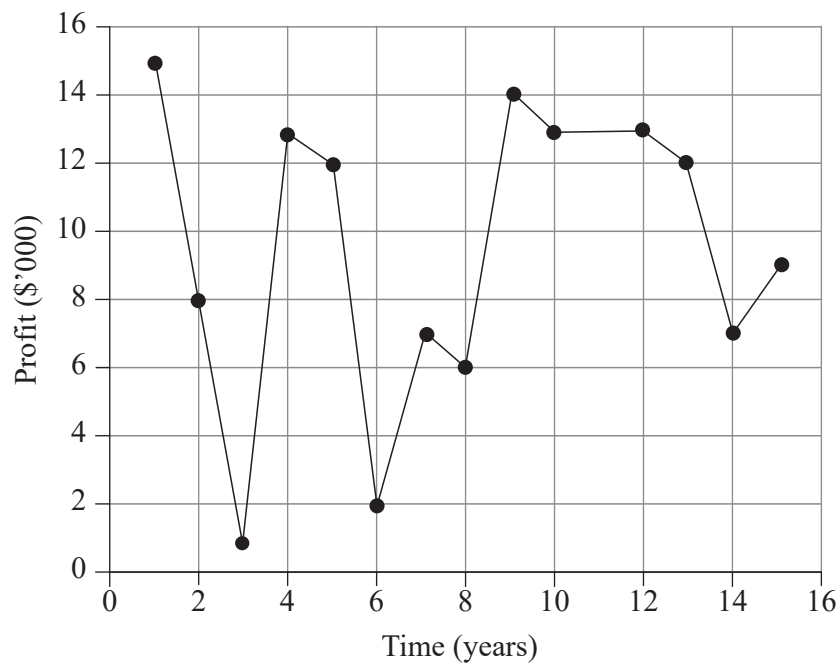## QUESTION 1

A linear association with a correlation coefficient of 0.23 is best described as

    (A)   weak positive.

    (B)   weak negative.

    (C)   strong positive.

    (D)   strong negative.

QUESTION 2

A time series plot is shown.

It could best be described as

    (A)   cyclical.

    (B)   seasonal.

    (C)   irregular.

    (D)   increasing.

QUESTION 3

The duration, in minutes, of all activities in a project are shown.

Activity	P	Q	R	S	T	U	V
Duration	38	42	32	34	16	14	26

The critical path for the project is PRSV.

What is the earliest completion time for the project if it starts at 11:00 am?

   (A) 12:30 pm

   (B) 1:10 pm

   (C) 1:30 pm

   (D) 2:10 pm

QUESTION 4

Athletes were surveyed about their preferred shoe brand: X, Y or Z. The results are shown in the frequency table.

	X	Y	Z	Total
Field athletes	26	12	2	40
Track athletes	14	18	8	40
Total	40	30	10	80

The percentage of field athletes who prefer brand Y is

   (A) 12%

   (B) 15%

   (C) 30%

   (D) 40%

QUESTION 5

A scatterplot is created to identify the nature of the relationship between two variables: vehicle age and distance travelled.

Which statement is correct?

(A)   The vertical axis should show vehicle age as the response variable.

(B)   The horizontal axis should show vehicle age as the explanatory variable.

(C)   The horizontal axis should show distance travelled as the response variable.

(D)   The vertical axis should show distance travelled as the explanatory variable.

QUESTION 6

In January 2022, 40 fish were released into a new dam that has the capacity to support 10 000 fish. It is predicted that the dam will reach its capacity in January 2030 if the fish population doubles every year.

Which sequence rule models the prediction?

(A) $t_n = t_1 r^{(n-1)}$, where $t_1 = 40$, $r = 2$, $n = 8$

(B) $t_n = t_1 r^{(n-1)}$, where $t_1 = 40$, $r = 2$, $n = 9$

(C) $t_n = t_1 + (n-1)d$, where $t_1 = 40$, $d = 2$, $n = 8$

(D) $t_n = t_1 + (n-1)d$, where $t_1 = 40$, $d = 2$, $n = 9$

QUESTION 7

Which statement is always true for a causal relationship between an explanatory variable and a response variable?

(A)   One of the variables is a confounding variable.

(B)   The relationship is explained by a third variable.

(C)   There is a positive association between the variables.

(D)   The response variable is dependent on the explanatory variable.

QUESTION 8

Activities P and Q are the critical activities for a project.

Activity	Duration	Prerequisite activity
P	3	–
Q	6	P

What are the earliest starting time (EST) and latest starting time (LST) for Activity Q?

	EST	LST
(A)	3	3
(B)	3	6
(C)	6	6
(D)	6	9

QUESTION 9

Determine the 6th term of the arithmetic sequence that begins 3, 9, …

    (A) 21

    (B) 33

    (C) 45

    (D) 729

QUESTION 10

Annual sales data and related quarterly indices are shown. The quarterly indices were calculated by applying the average percentage method using the mean.

Quarter	Q1	Q2	Q3	Q4
Sales	160	x	128	200
Index	1.0	0.95	y	1.25

Determine the values for x and y.

	x	y
(A)	122	0.8
(B)	122	3.2
(C)	152	0.8
(D)	152	3.2

QUESTION 11

An annuity with an initial zero balance has $500 deposited at the end of every month. The annuity earns 4.8% p.a. interest, compounding monthly. At the end of the fourth month, the balance is closest to

(A) $2002

(B) $2008

(C) $2012

(D) $2014

QUESTION 12

A reducing balance loan with an initial balance of $6000 is modelled by the recurrence relation

$A_{n+1} = \left(1 + \dfrac{0.03}{12}\right) A_n - 400$, where n is the number of months.
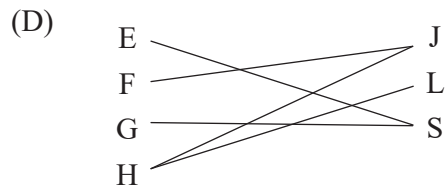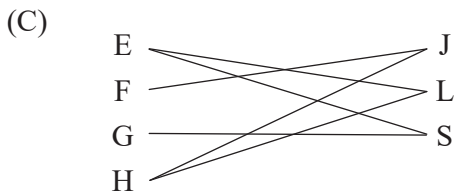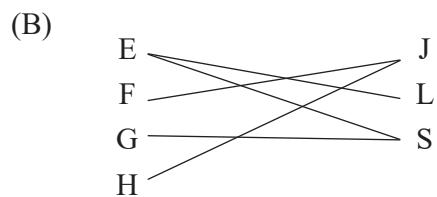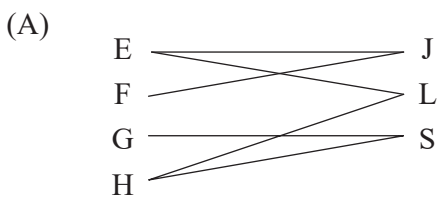
The loan balance at the end of two months is closest to

(A) $5100

(B) $5200

(C) $5215

(D) $5230

QUESTION 13

Four athletes, Eoin (E), Fedir (F), Gede (G) and Hana (H), compete in three events: javelin (J), long jump (L) and sprints (S).

Athlete	Events
Eoin	L, S
Fedir	J
Gede	S
Hana	J, L

Which bipartite graph represents this information?

(A)

(B)

(C)

(D)

QUESTION 14

A calculator is used to determine the equation of the least-squares line for the plant growth data in the table.

Number of days, d	6	15	20	24	35
Height of plant, h	12	14	16	18	30

What is the correct equation?

(A) $d = 0.6h + 5.7$

(B) $h = 0.6d + 5.7$

(C) $d = 5.7h + 0.6$

(D) $h = 5.7d + 0.6$

QUESTION 15

The resale value of a boat shows geometric decay.

Years after purchase	0	1	2
Resale value ($)	50 000	40 000	32 000

Determine the resale value four years after purchase.

(A) $16 000

(B) $20 480

(C) $22 000

(D) $25 600

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