— Public use —

Sample assessment 2020

General Mathematics

Paper 1

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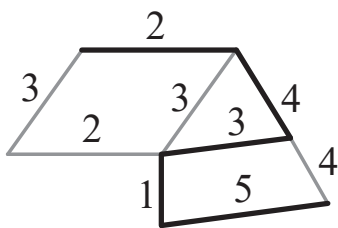
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Section 1

Instructions

- Answer all questions in the question and response book.
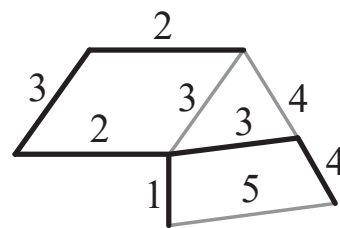- This book will not be marked.

QUESTION 1

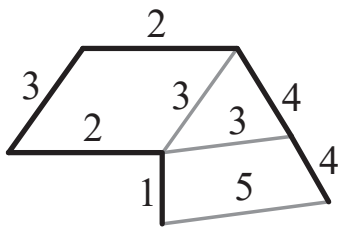Identify a minimum spanning tree from the diagrams below.

(A)
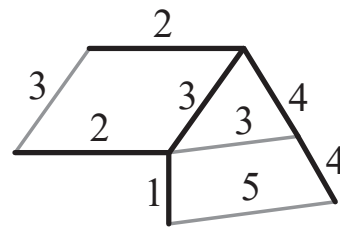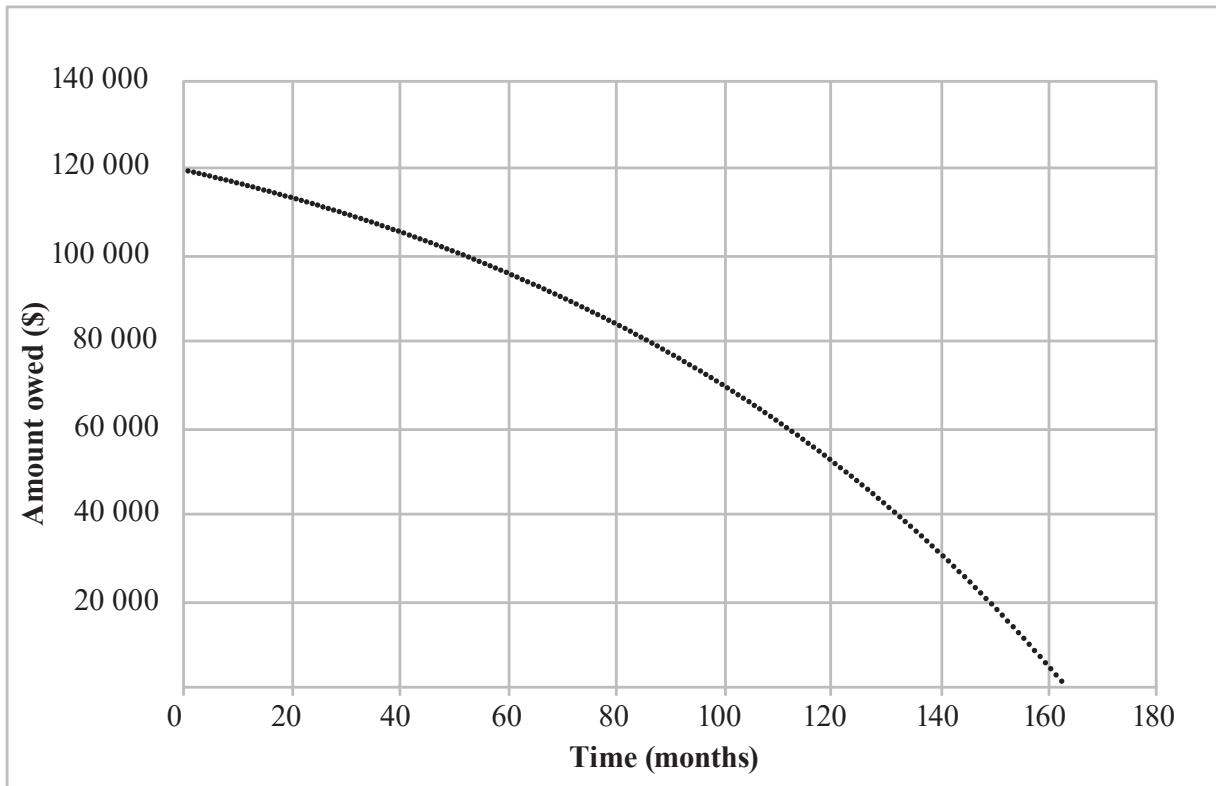

(B)

(C)

(D)

QUESTION 2

The graph below shows the relationship between the amount owed and time taken to repay a reducing balance loan.

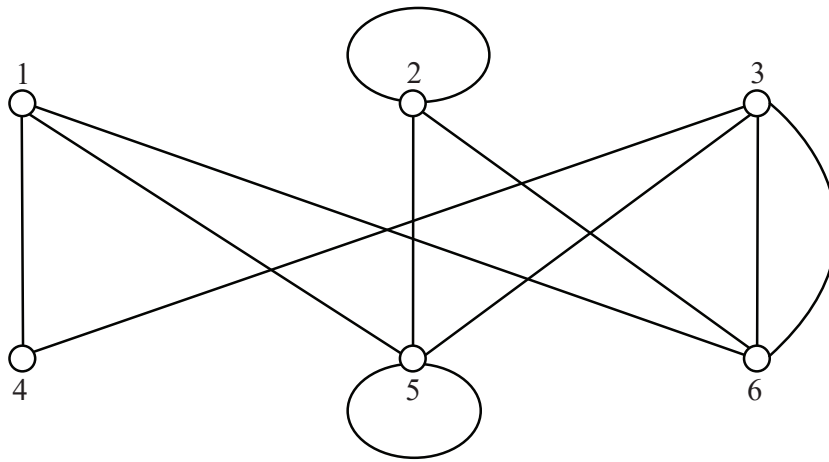The owed amount will be reduced to half the original amount borrowed in

(A) 60 months.

(B) 81 months.

(C) 112 months.

(D) 162 months.

QUESTION 3

The graph below has six vertices.

The vertex with the smallest degree is

(A) 1

(B) 2

(C) 3

(D) 4

QUESTION 4

A sequence is defined by

$a_n = a_{n-1} + 14$

Given that $a_4 = 56$, the value of a_2 is

(A) 14

(B) 28

(C) 42

(D) 70

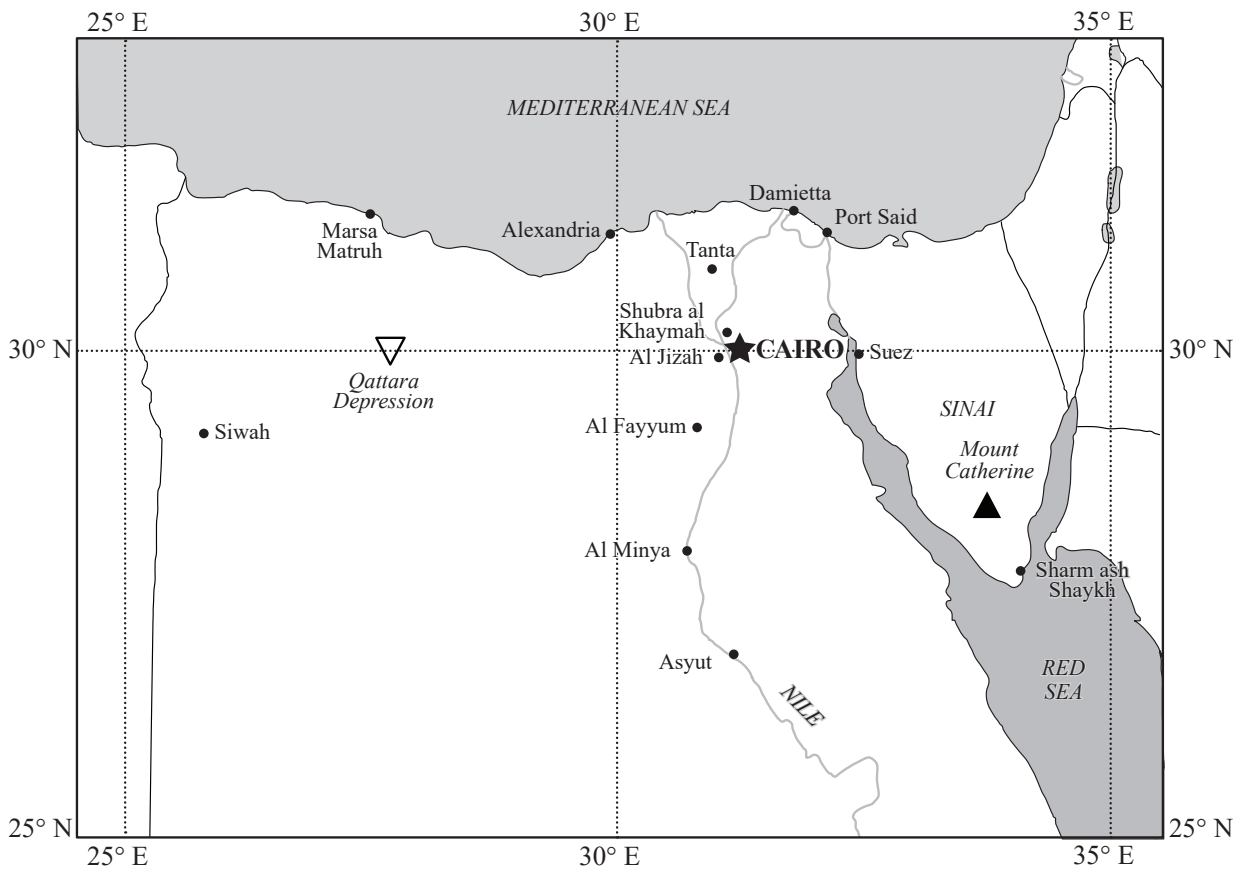## QUESTION 5

Bivariate data involves

(A)   two values.

(B)   two variables.

(C)   two data displays.

(D)   two data varieties.

QUESTION 6

Use the map to determine which city is located closest to (31° N, 31° E).

(A)   Tanta

(B)   Damietta

(C)   Alexandria

(D)   Al Fayyum

QUESTION 7

To calculate the number of degrees of longitude across the Earth's surface for a time zone difference of one hour, use

(A) $\dfrac{90}{12}$

(B) $\dfrac{90}{24}$

(C) $\dfrac{360}{12}$

(D) $\dfrac{360}{24}$

QUESTION 8

Activities A, B, C, D, E, F, G, H and J must be completed for the project shown in the network. Activity times are in minutes.
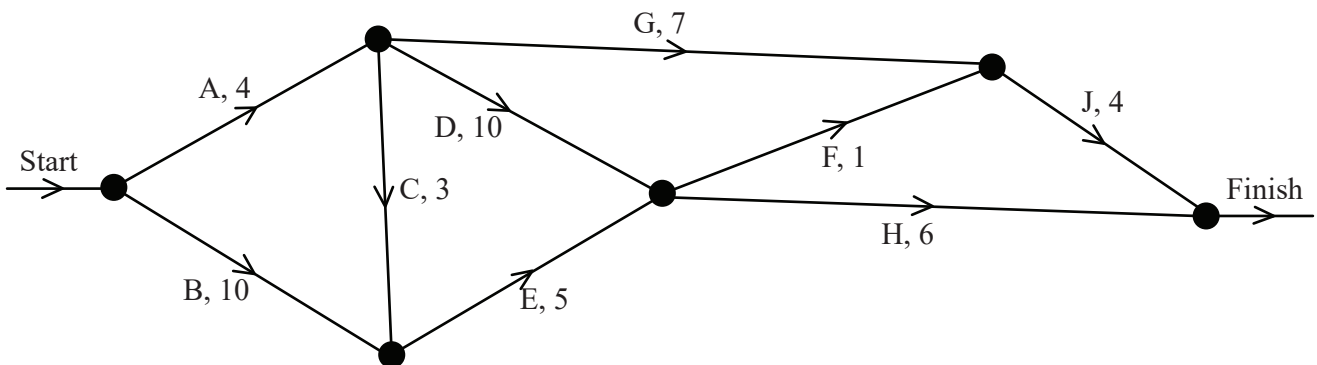
The earliest starting time in minutes for Activity J on the network diagram above is

(A) 16

(B) 15

(C) 13

(D) 11
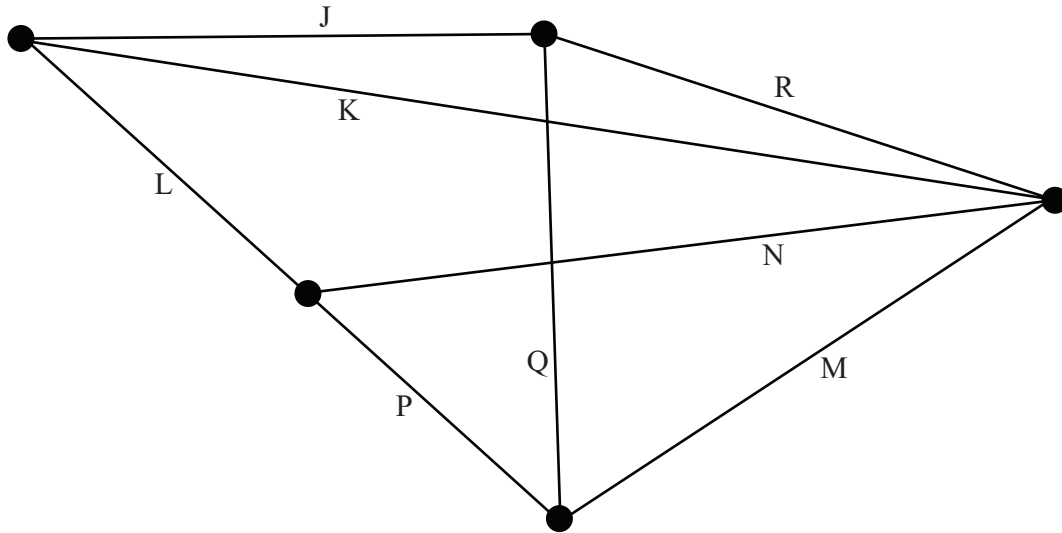
QUESTION 9

The edges J, R, M, P, P, Q on the network diagram above make

(A) a path.

(B) a cycle.

(C) a closed trail.

(D) an open walk.

QUESTION 10

The fourth, fifth and sixth terms of a geometric sequence are 7.5, 3.75 and 1.875 respectively.

The sum of the first and second terms in the geometric sequence is

(A) 15

(B) 30

(C) 45

(D) 90

QUESTION 11

Two variables are displayed on a scatterplot. Which statement below is correct?

(A) Only if there is a causal relationship between the two variables will they have a positive association.

(B) If the two variables have a negative association then there is not a causal relationship between the two variables.

(C) If the two variables are associated either positively or negatively then there could be a causal relationship between the two variables.

(D) If the two variables are associated either positively or negatively then there is definitely a causal relationship between the two variables.

QUESTION 12

Quarterly sales figures for a company between 2005 and 2017 were used to determine the following seasonal indices.

Season	First quarter	Second quarter	Third quarter	Fourth quarter
Seasonal index	1.05	1.11	0.83	0.99

The table below shows the sales figures for 2018.

Season	First quarter	Second quarter	Third quarter	Fourth quarter
Sales figures ($)	450 075	497 660	480 085	505 025

Determine the seasonally adjusted sales figure for the second quarter of 2018 to the nearest dollar.

(A) $428 643

(B) $448 342

(C) $472 579

(D) $552 403

QUESTION 13

For a personal loan of $350, a payment of $60 is made after interest is added each month. The following recurrence relation shows the remaining balance at the end of consecutive months. The recurrence relation is
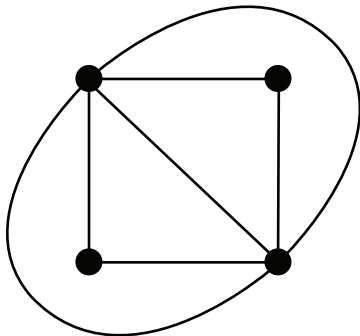
$A_{n+1} = 1.0243A_n - 60$

The remaining balance after two months is
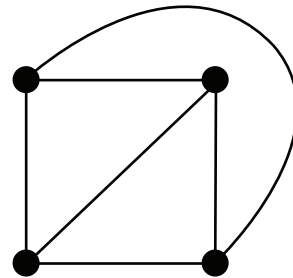
(A) $191.73

(B) $242.81

(C) $245.76

(D) $298.51

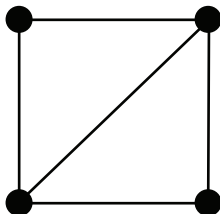## QUESTION 14

Identify the planar graph that has four faces.

(A)
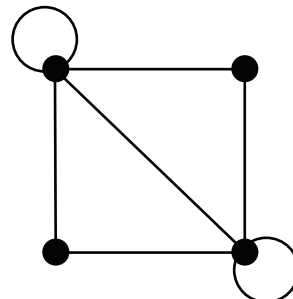

(B)

(C)

(D)

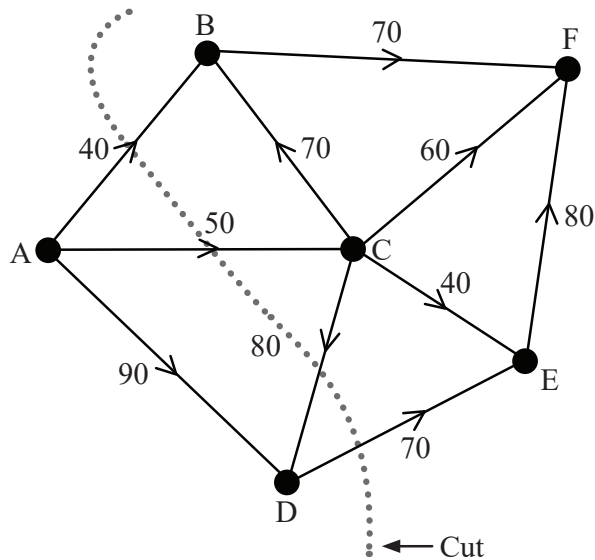## QUESTION 15

The prime meridian is located at

  (A) 0° latitude.

  (B) 0° longitude.

  (C) the intersection of 0° latitude and 0° longitude.

  (D) the intersection of 0° latitude and 180° longitude.

QUESTION 16

Determine the value of the cut made on the network diagram below.

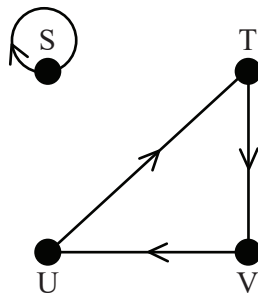 (A) 160

  (B) 170

  (C) 180

  (D) 240

QUESTION 17

A reducing balance loan of $12 000 was taken out at 10.5% per annum with interest calculated monthly for five years.

Determine the monthly repayment required to pay off the loan.

(A) $152.93

(B) $162.18

(C) $257.93

(D) $267.18

QUESTION 18

Which adjacency matrix below represents the same information that is given in the network diagram?

(A)

To

	S	T	U	V
S	1	0	0	0
T	0	0	1	0
U	0	0	0	1
V	0	1	0	0

From

(B)

To

	S	T	U	V
S	1	0	0	0
T	0	1	1	0
U	0	0	1	1
V	0	1	0	1

From

(C)

To

	S	T	U	V
S	1	0	0	0
T	0	0	0	1
U	0	1	0	0
V	0	0	1	0

From

(D)

To

	S	T	U	V
S	1	0	0	0
T	0	0	1	1
U	0	1	0	1
V	0	1	1	0

From

QUESTION 19

An investment of $10 000 is made at an interest rate of 7.5% per annum compounding half yearly.

The number of years it will take for the value of the investment to exceed $18 000 is

    (A) 7

    (B) 8

    (C) 15

    (D) 16

QUESTION 20

Fitting a least-squares line to create a model from a set of time series data ensures that

    (A)   the distances between the data points and the line of best fit are minimised.

    (B)   the same number of data points are above and below the line of best fit.

    (C)   the distances between the data points and the axes are minimised.

    (D)   the least-squares distances of all data points are added together.

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