2018 VCE Further Mathematics 1 (NHT) examination report

Specific information

This report provides sample answers or an indication of what answers may have included. Unless otherwise stated, these are not intended to be exemplary or complete responses.

Section A – Core

Data analysis

Question	Answer
1	C
2	E
3	D
4	ABC
5	A
6	E
7	E
8	A
9	B
10	A
11	E
12	B
13	A
14	B
15	D
16	C

Question 4

The best estimate of the IQR from this histogram is 1.5, therefore option B.

Under particular conditions it would be possible for the IQR to be as small as 1.0 or as large as 2.0, therefore options A and C were also accepted.

Question 11

Irregular fluctuations are a feature of all time series plots.

Question 16

The monthly average needs to be calculated firstly as $\frac{1113}{12} = 92.75$

The seasonal index for May will then be $\frac{54}{92.75} \approx 0.58$

Recursion and financial modelling

Question	Answer
17	B
18	C
19	D
20	A
21	D
22	E
23	B
24	D

Question 23

Writing as a recurrence relation,

$V_0 = 85000, \quad V_{n+1} = \frac{6019}{6000} V_n + 1500$ (where $\frac{6019}{6000} = 1 + \frac{3.8}{1200}$)

From a table of values $V_6 = 95\ 699.39$

Question 24

Total paid by Indira over the two years $= 12 \times 425 + 12 \times 500 = \$11100$

The future value of the loan after two years using a finance solver $= \$24\ 715$, to the nearest dollar.

The reduction in the amount owed by Indira $= 29\ 000 - 24\ 715 = \$4285$

The interest paid by Indira $= 11\ 100 - 4285 = \$6815$

Module 1 – Matrices

Question	Answer
1	C
2	B
3	D
4	A
5	C
6	C
7	A
8	A

Question 7

The *number* of customers not expected to change their rating is

$0.2 \times 40 + 0.3 \times 110 + 0.3 \times 50 = 56$

The *percentage* of customers not expected to change their rating is

$\frac{56}{200} \times 100 = 28\%$

Question 8

The steady state matrix is $\begin{bmatrix} 49.15 \\ 91.52 \\ 59.32 \end{bmatrix}$, with values rounded to two decimal places.

The proportion of the excellent group changing to good each month is 0.5

$0.5 \times 59.32 \approx 29.66$

Module 2 – Networks and decision mathematics

Question	Answer
1	E
2	B
3	B
4	D
5	E
6	C
7	B
8	D

Module 3 – Geometry and measurement

Question	Answer
1	A
2	C
3	E
4	B
5	D
6	D
7	C
8	E

Module 4 – Graphs and relations

Question	Answer
1	B
2	A
3	D
4	B
5	C
6	E
7	B
8	E

Question 2

From the step graph, the price of a roasted chicken five hours after cooking is \$9.

The reduction from the full price is $12 - 9 = \$3$.

Question 7

Consider firstly a ratio of three pears to five apples:

$x : y$

$3 : 5$

As an equality $\frac{y}{x} = \frac{5}{3} \Rightarrow y = \frac{5x}{3}$

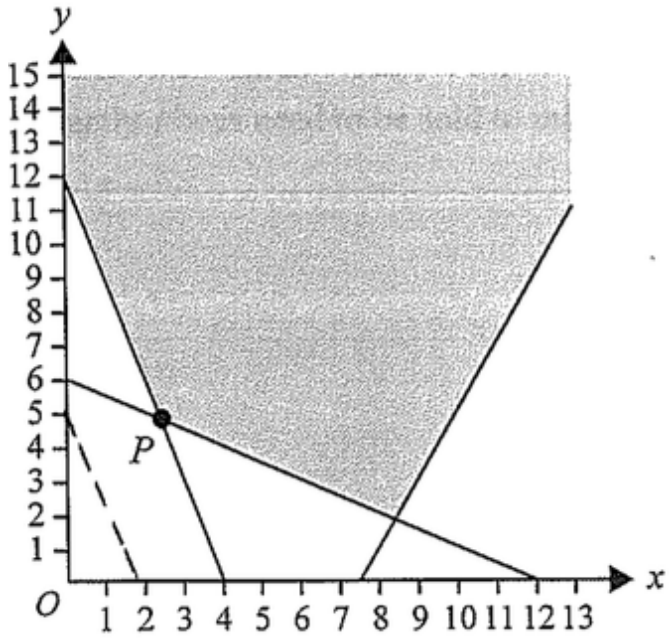
As an inequality 'at least' is represented by $\geq$

Therefore $y \geq \frac{5x}{3}$

Question 8

Using the sliding-line method, the slope of the objective function Z is $-\frac{5}{2}$.

As shown in the diagram of the correct option E, a dotted line is drawn with this slope.



As the coefficients of x and y in the objective function are both positive, the first point reached by the sliding line is the minimum.

In both options A and B, the minimum can occur at point *P* but can also occur at all points along the line segment that connects *P* to the *y*-intercept. In each case, this line segment is parallel to the objective function and so options A and B are both incorrect.