Write your name here

Surname

Other names

Centre Number

Candidate Number

Further Mathematics

Advanced
Further Mathematics Option 1
Paper 3: Decision Mathematics 1
Further Mathematics Option 2
Paper 4: Decision Mathematics 1

Answer Book
Do not return the question paper with the answer book.

Total Marks

Turn over ▶

S54443A

S54443A0116

1.

Question 1 continued

(Total for Question 1 is 4 marks)

2.
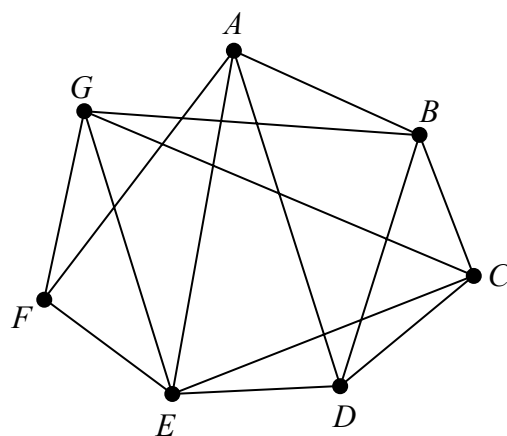
Figure 1

Question 2 continued
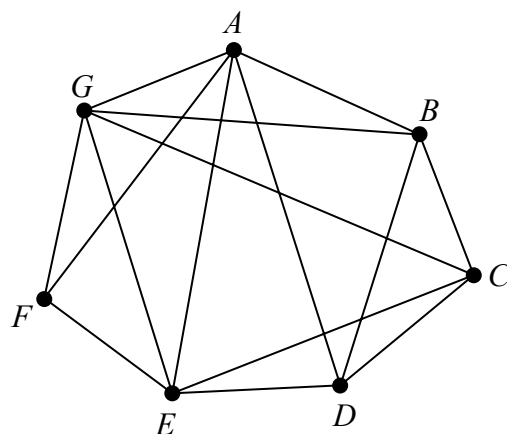
Figure 2

(Total for Question 2 is 7 marks)

3.

	A	B	C	D	E	F	G
A	–	17	24	16	21	18	41
B	17	–	35	25	30	31	x
C	24	35	–	28	20	35	32
D	16	25	28	–	29	19	45
E	21	30	20	29	–	22	35
F	18	31	35	19	22	–	37
G	41	x	32	45	35	37	–

Question 3 continued

	A	B	C	D	E	F	G
A	–	17	24	16	21	18	41
B	17	–	35	25	30	31	x
C	24	35	–	28	20	35	32
D	16	25	28	–	29	19	45
E	21	30	20	29	–	22	35
F	18	31	35	19	22	–	37
G	41	x	32	45	35	37	–

(Total for Question 3 is 11 marks)

4.
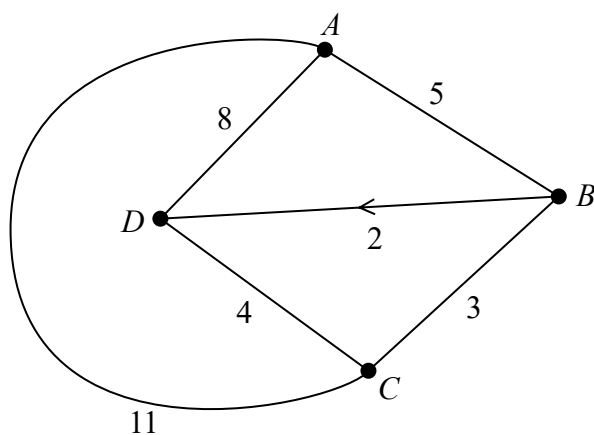
Figure 3

(b)

	A	B	C	D
A	–	5	11	8
B	5	–	3	2
C	11	3	–	4
D	8	∞	4	–

	A	B	C	D
A	A	B	C	D
B	A	B	C	D
C	A	B	C	D
D	A	B	C	D

	A	B	C	D
A				
B				
C				
D				

	A	B	C	D
A				
B				
C				
D				

	A	B	C	D
A				
B				
C				
D				

	A	B	C	D
A				
B				
C				
D				

Question 4 continued

	A	B	C	D
A				
B				
C				
D				

	A	B	C	D
A				
B				
C				
D				

	A	B	C	D
A				
B				
C				
D				

	A	B	C	D
A				
B				
C				
D				

(Total for Question 4 is 14 marks)

5.

Question 5 continued

(Total for Question 5 is 15 marks)

6.

Key:

| Early event time |
| Late event time |

E(6)

F(2)

I(4)

A(4)

D(9)

C(7)

H(5)

B(5)

J(9)

M(4)

G(8)

K(5)

L(2)

Diagram 1

Question 6 continued

0 2 4 6 8 10 12 14 16 18 20 22 24 26
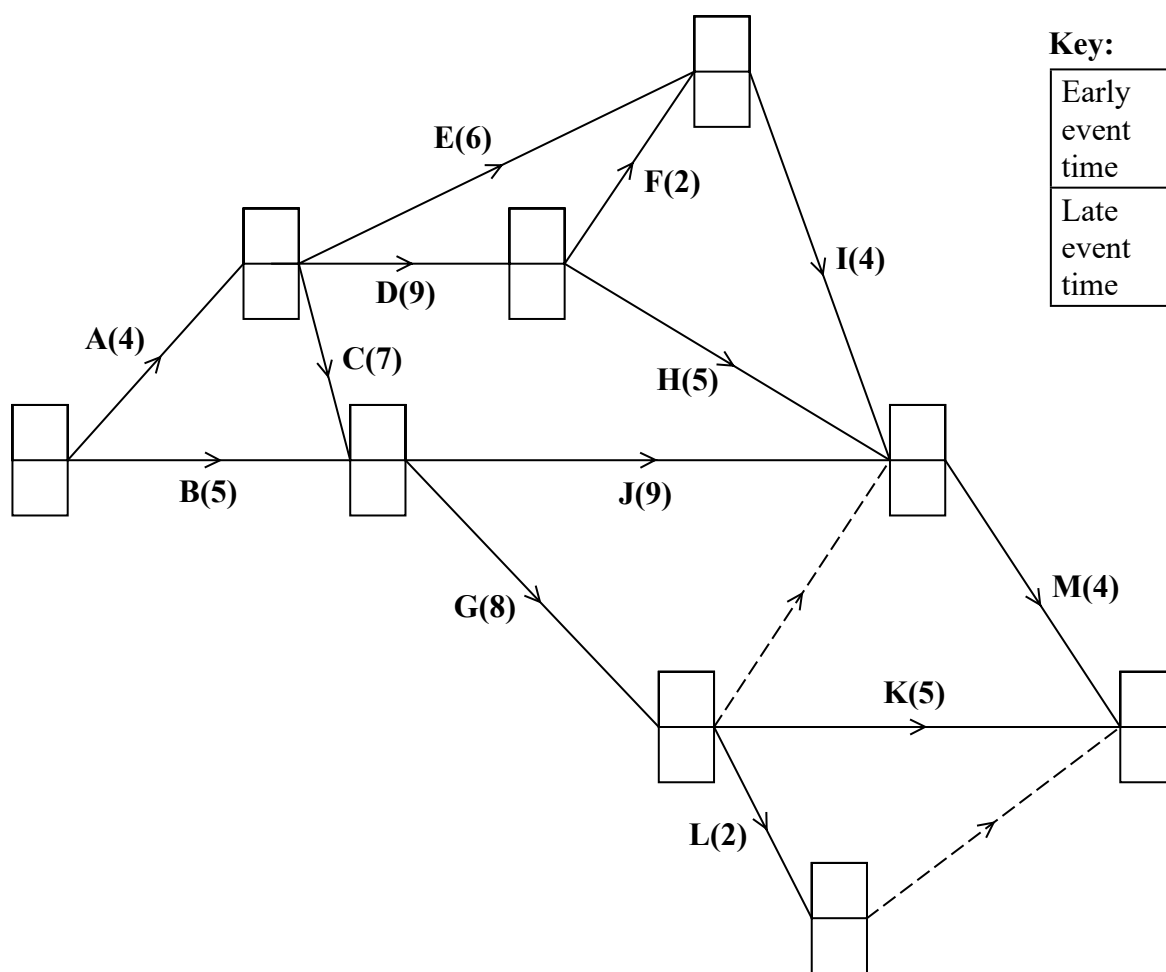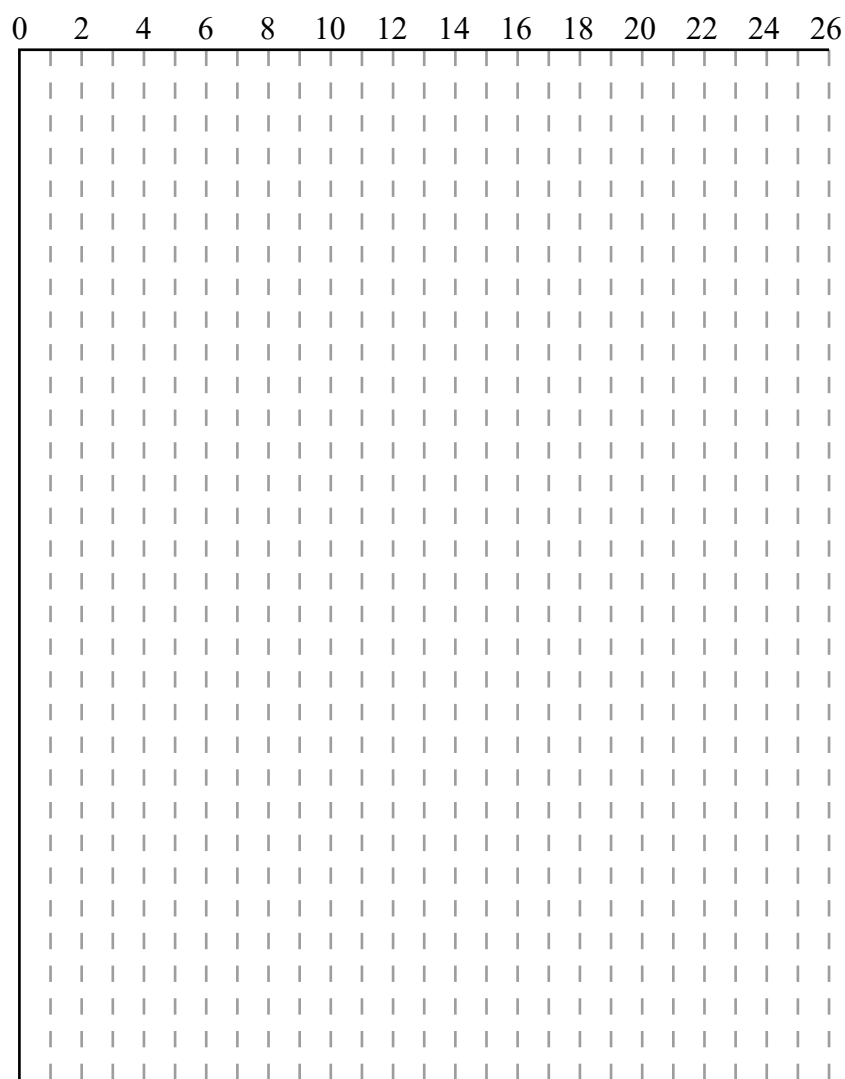
Grid 1

(There is a spare grid on the next page)

Workers

0 2 4 6 8 10 12 14 16 18 20 22 24 26   Days

Grid 2

Question 6 continued

0   2   4   6   8   10 12 14 16 18 20 22 24 26

Copy of Grid 1

(Total for Question 6 is 12 marks)
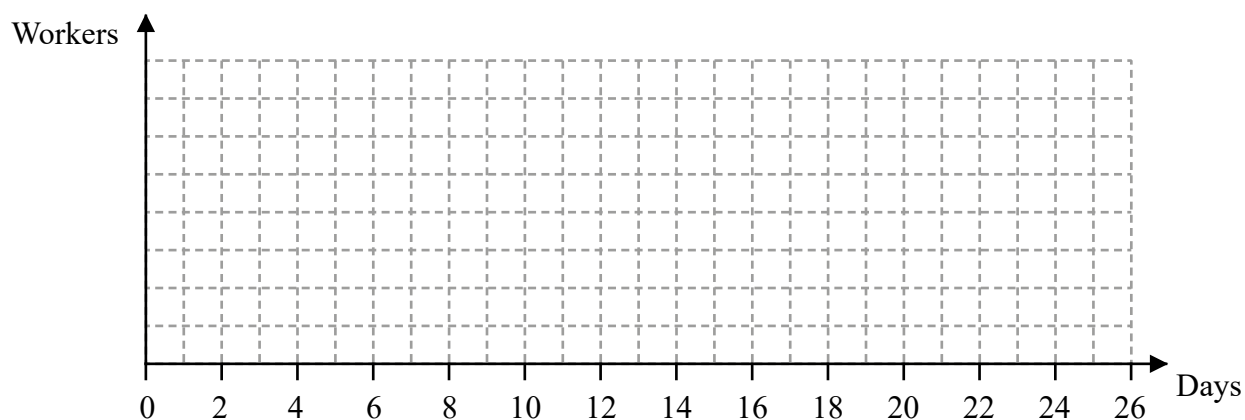
7.

b.v.	x	y	z	s_1	s_2	s_3	t_1	Value
s_1	0	2	1	1	0	2	−2	19
s_2	0	4	0	0	1	1	−1	12
x	1	0	0	0	0	−1	1	3
P	0	−2	−2	0	0	−3	$3 + M$	9

b.v.	x	y	z	s_1	s_2	s_3	t_1	Value	Row Ops
P									

b.v.	x	y	z	s_1	s_2	s_3	t_1	Value	Row Ops
P									

Question 7 continued

b.v.	x	y	z	s_1	s_2	s_3	t_1	Value	Row Ops
P									

b.v.	x	y	z	s_1	s_2	s_3	t_1	Value	Row Ops
P									

(Total for Question 7 is 12 marks)

TOTAL FOR PAPER IS 75 MARKS