

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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Pearson Edexcel Level 3 GCE

Friday 23 June 2023

Afternoon (Time: 1 hour 30 minutes)

**Paper
reference**

9FM0/3D

Further Mathematics

Advanced

PAPER 3D: Decision Mathematics 1

Answer Book

Do not return the question paper with the answer book.

Total Marks

Turn over ►

P72799A

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1.

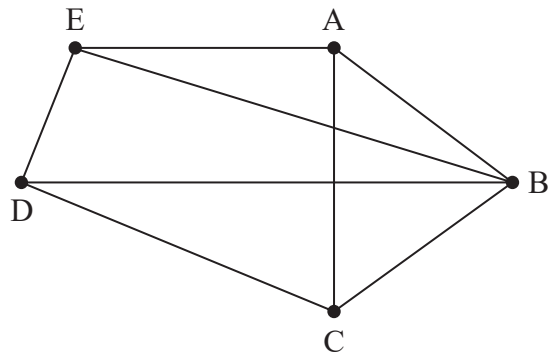


Figure 1



Question 1 continued

(e) Initial time matrix

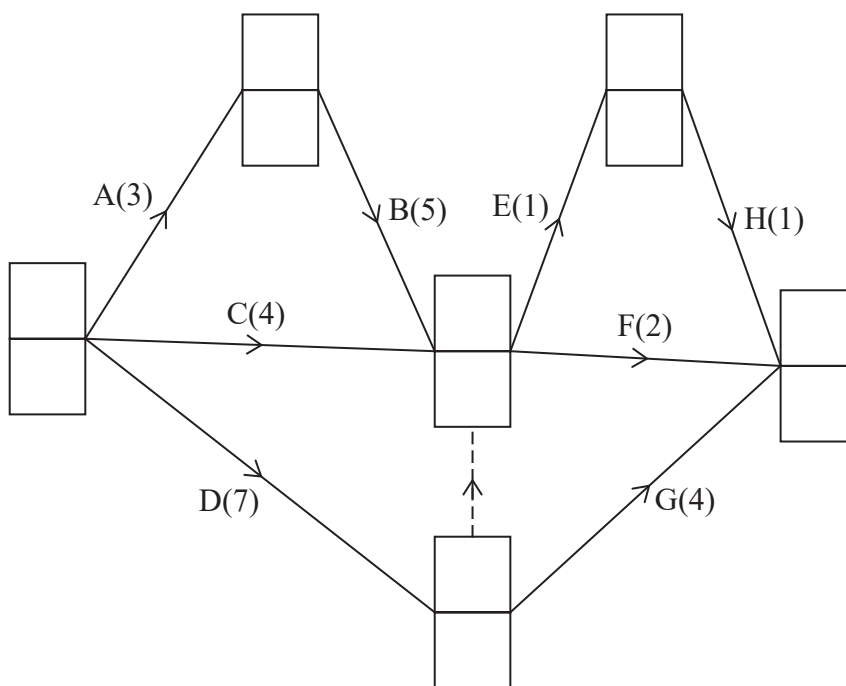
	A	B	C	D	E
A	—				
B		—			
C			—		
D				—	
E					—

(f) Final iteration

	A	B	C	D	E
A	—				
B		—			
C			—		
D				—	
E					—

(Total for Question 1 is 7 marks)

2.



Key:

Early event time
Late event time

Diagram 1

DO NOT WRITE IN THIS AREA

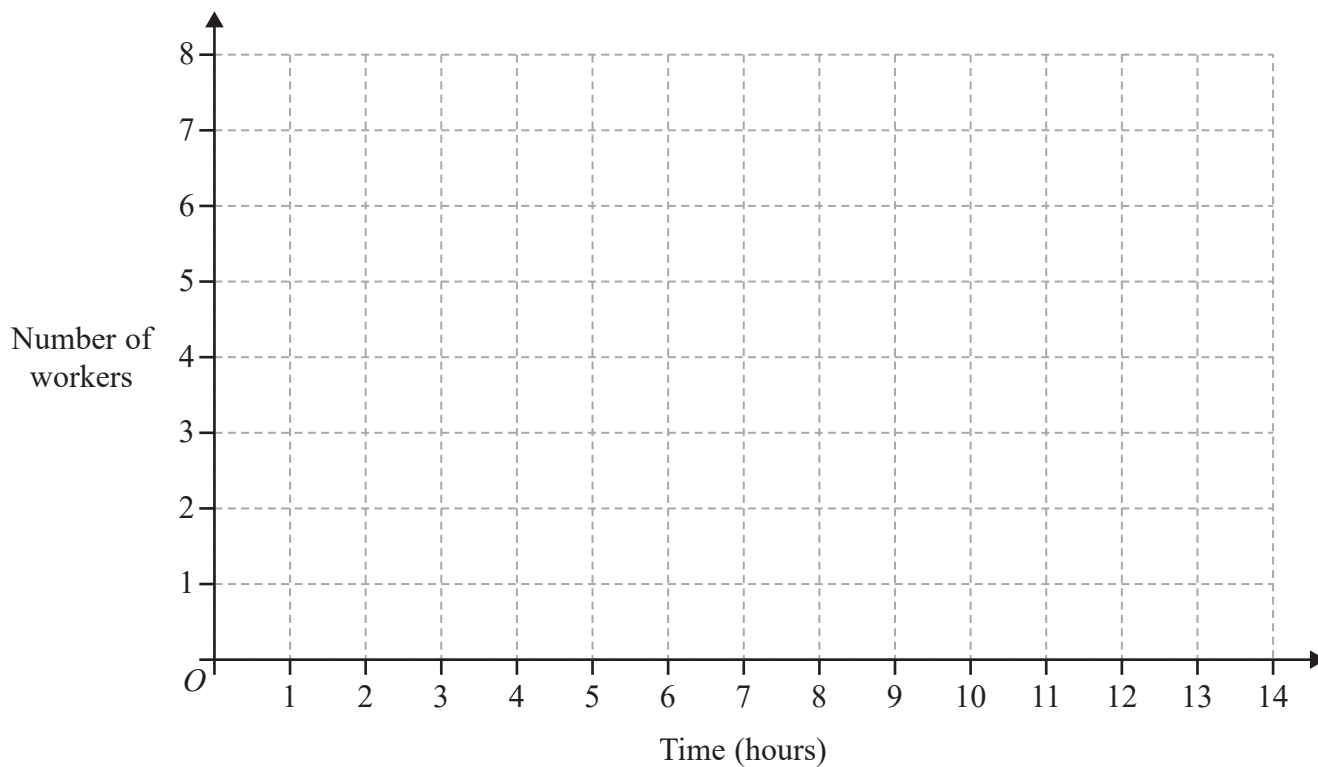
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

Question 2 continued

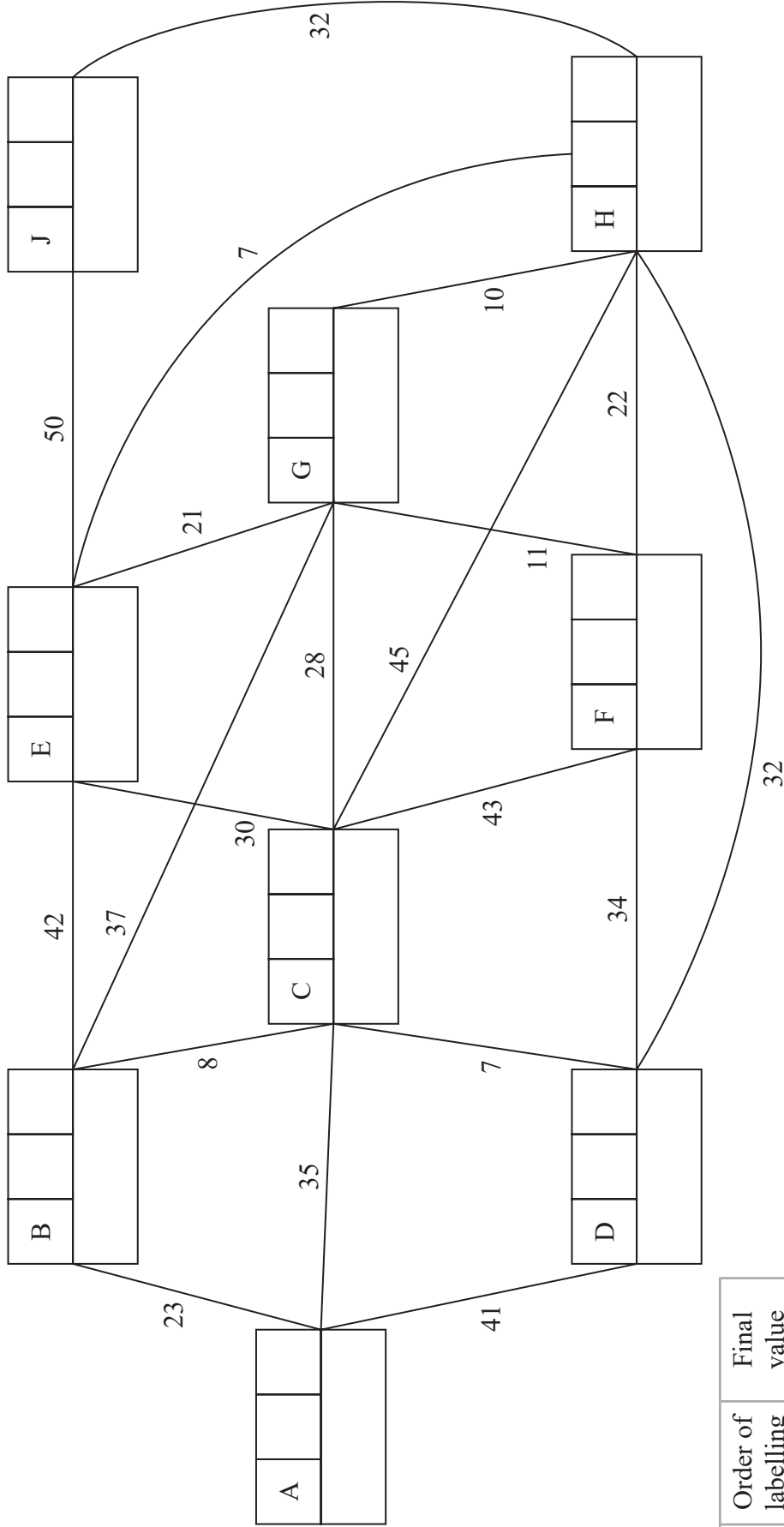


Grid 1

Blank lined area for writing answers.

(Total for Question 2 is 7 marks)

3.



Key:

Vertex	Order of labelling	Final value
Working values		

Shortest path from A to J: _____

Length of shortest path from A to J: _____

DO NOT WRITE IN THIS AREA

Question 3 continued

Lined area for writing answers.

(Total for Question 3 is 8 marks)



4.

15 22 3 9 23 x 5 4 18 20 13

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

Question 4 continued

15 22 3 9 23 x 5 4 18 20 13

Lined area for writing the answer to Question 4.



Question 4 continued

15 22 3 9 23 x 5 4 18 20 13

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

15 22 3 9 23 x 5 4 18 20 13



5.

	A	B	C	D	E	F	G	H	J
A	–	34	51	31	79	20	8	55	61
B	34	–	17	65	45	54	42	21	27
C	51	17	–	82	28	71	59	22	10
D	31	65	82	–	87	22	23	86	92
E	79	45	28	87	–	65	87	30	18
F	20	54	71	22	65	–	28	75	81
G	8	42	59	23	87	28	–	63	69
H	55	21	22	86	30	75	63	–	12
J	61	27	10	92	18	81	69	12	–

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

Question 5 continued

	A	B	C	D	E	F	G	H	J
A	–	34	51	31	79	20	8	55	61
B	34	–	17	65	45	54	42	21	27
C	51	17	–	82	28	71	59	22	10
D	31	65	82	–	87	22	23	86	92
E	79	45	28	87	–	65	87	30	18
F	20	54	71	22	65	–	28	75	81
G	8	42	59	23	87	28	–	63	69
H	55	21	22	86	30	75	63	–	12
J	61	27	10	92	18	81	69	12	–

Handwriting practice lines consisting of 20 horizontal lines.

Question 5 continued

	A	B	C	D	E	F	G	H	J
A	–	34	51	31	79	20	8	55	61
B	34	–	17	65	45	54	42	21	27
C	51	17	–	82	28	71	59	22	10
D	31	65	82	–	87	22	23	86	92
E	79	45	28	87	–	65	87	30	18
F	20	54	71	22	65	–	28	75	81
G	8	42	59	23	87	28	–	63	69
H	55	21	22	86	30	75	63	–	12
J	61	27	10	92	18	81	69	12	–

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

6.



DO NOT WRITE IN THIS AREA

Question 6 continued

Handwriting practice area with horizontal lines.

(Total for Question 6 is 9 marks)



7.

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



Question 7 continued

[illegible]

Parts (c), (d) and (e) to be answered on the next page.



Question 7 continued

b.v.	x	y	z	s_1	s_2	s_3	s_4	Value
s_1	0	0	0	1	1	3	0	600
z	0	$\frac{4}{11}$	1	0	$-\frac{1}{11}$	$\frac{1}{11}$	0	$\frac{2000}{11}$
x	1	$\frac{7}{11}$	0	0	$\frac{1}{11}$	$-\frac{12}{11}$	0	$\frac{15600}{11}$
s_4	0	$\frac{40}{11}$	0	0	$\frac{1}{11}$	$-\frac{12}{11}$	1	$\frac{15600}{11}$
P	0	$-\frac{4}{11}$	0	0	$-\frac{32}{11}$	$-\frac{56}{11}$	0	$\frac{204800}{11}$

b.v.	x	y	z	s_1	s_2	s_3	s_4	Value	Row Ops
P									

(Total for Question 7 is 19 marks)

TOTAL FOR PAPER IS 75 MARKS

