

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

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 ►

P72094A

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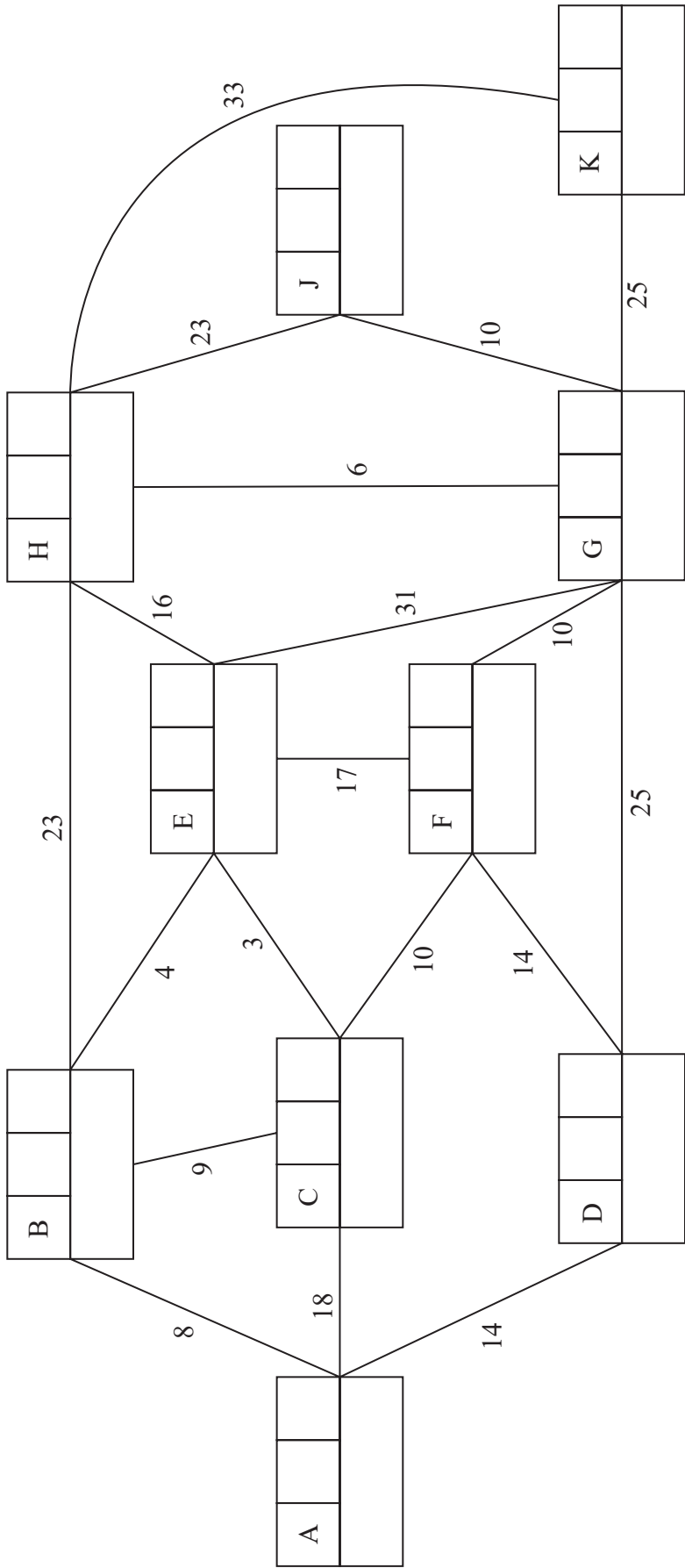
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Pearson



2.



Key:

Vertex	Order of labelling	Final value
		Working value

Shortest path from A to K: \_\_\_\_\_

Length of shortest path from A to K: \_\_\_\_\_







3.

(a)

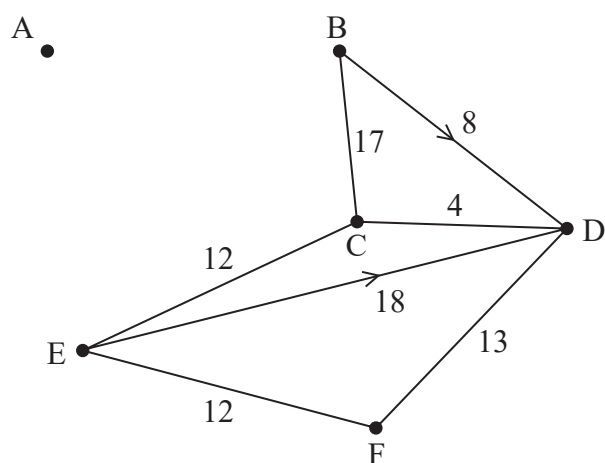


Diagram 1

(b)

There are spare copies of these tables, if required, on Page 9.

3rd iteration

	A	B	C	D	E	F
A	–					
B		–				
C			–			
D				–		
E					–	
F						–

4th iteration

	A	B	C	D	E	F
A	–					
B		–				
C			–			
D				–		
E					–	
F						–









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Question 3 continued

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(b)

Spare copy for 3rd iteration

	A	B	C	D	E	F
A	–					
B		–				
C			–			
D				–		
E					–	
F						–

Spare copy for 4th iteration

	A	B	C	D	E	F
A	–					
B		–				
C			–			
D				–		
E					–	
F						–

(Total for Question 3 is 10 marks)



4.

b.v.	$x$	$y$	$z$	$s_1$	$s_2$	$s_3$	$a_1$	$a_2$	Value
$s_1$	2	3	4	1	0	0	0	0	13
$a_1$	1	-2	2	0	-1	0	1	0	8
$a_2$	3	0	-4	0	0	-1	0	1	12
$P$	$2 - 4M$	$-3 + 2M$	$-1 + 2M$	0	$M$	$M$	0	0	$-20M$

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**Question 4 continued**

Lined area for writing the answer to Question 4.

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(Total for Question 4 is 6 marks)



5.

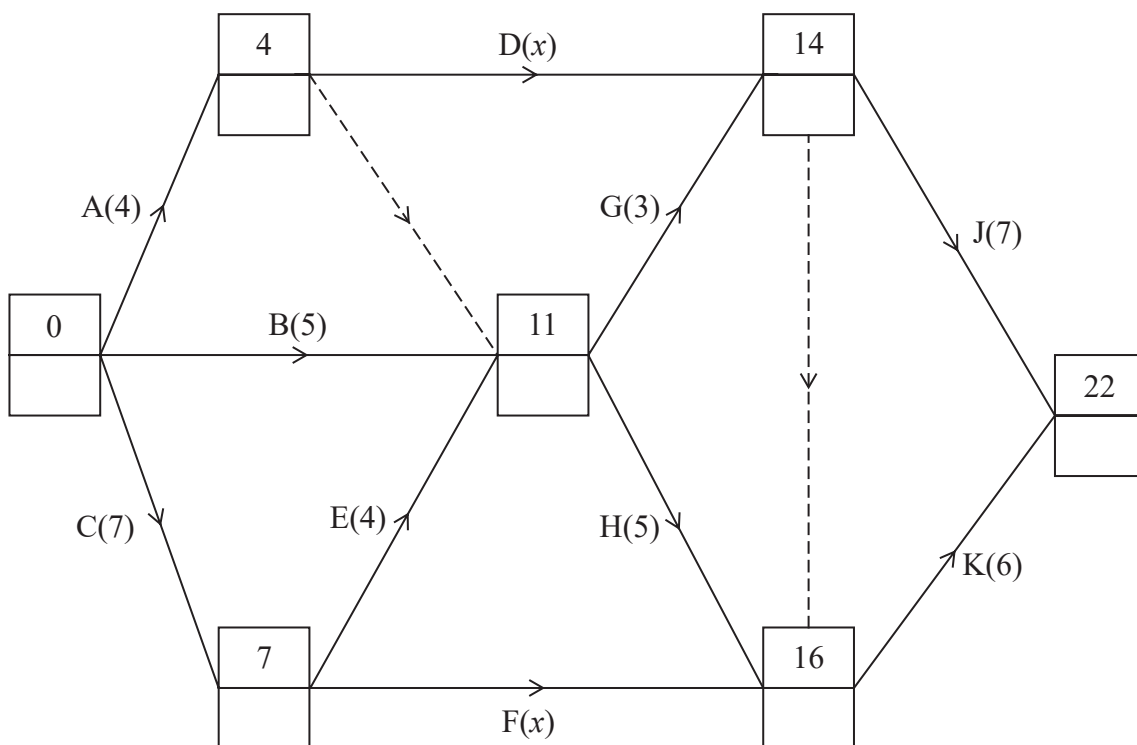
Activity	Immediately preceding activity
A	
B	
C	
D	
E	

Activity	Immediately preceding activity
F	
G	
H	
J	
K	

**Table 1**

(b)

(c)(i)



**Key:**

Early event time
Late event time

**Diagram 1**

(c)(ii)



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(d)

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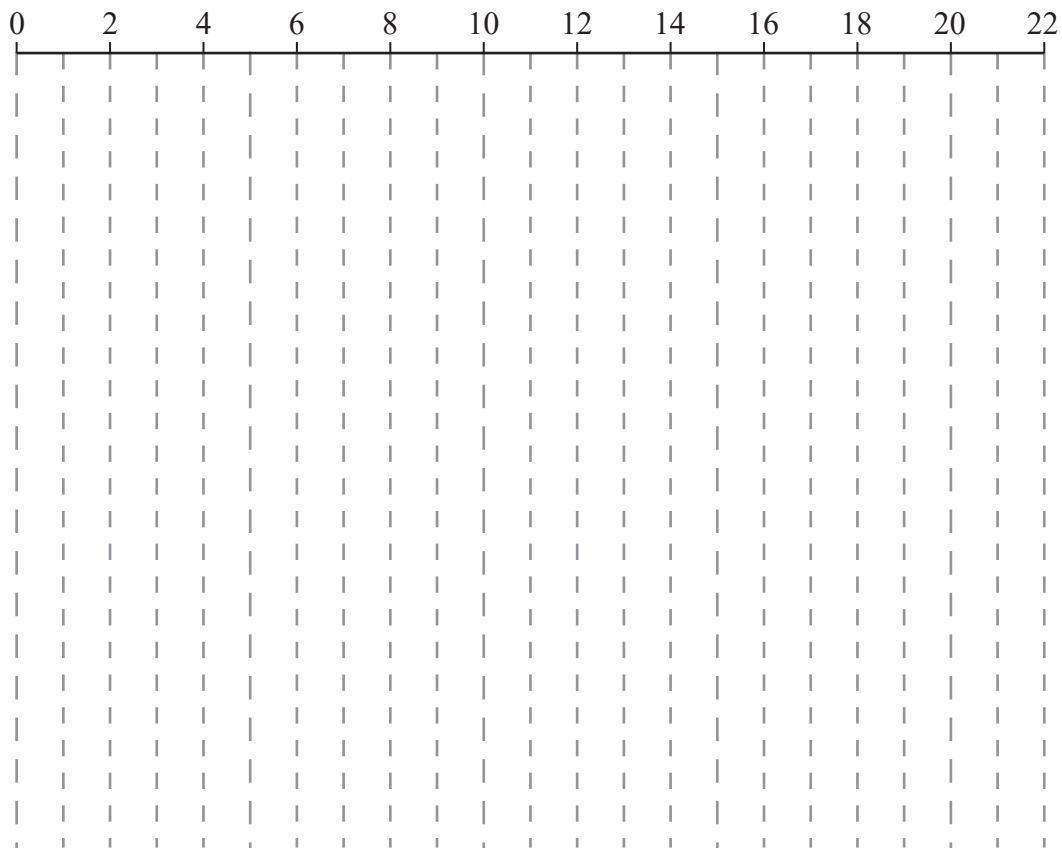
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(e)

Activity	Number of workers
A	
B	
C	
D	
E	

Activity	Number of workers
F	
G	
H	
J	
K	

Table 2



Grid 1

(Total for Question 5 is 14 marks)



6.

*You may not need to use all the rows in this table.*

*It may not be necessary to complete all the boxes in each row.*

$n$	$a$	$b$	$c$

Output: \_\_\_\_\_

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Question 6 continued

17 21 24 14 23 13 15 19 28 20

Lined writing area for student response.









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7.

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b.v.	$x$	$y$					Value
$P$							

(b)

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## Question 7 continued

b.v.	$x$	$y$	$s_1$	$s_2$	$s_3$	$s_4$	Value
$s_1$	0	0	1	$-\frac{3}{5}$	0	$\frac{1}{5}$	1
$x$	1	0	0	$\frac{1}{5}$	0	$-\frac{2}{5}$	2
$s_3$	0	0	0	$-\frac{11}{5}$	1	$\frac{12}{5}$	22
$y$	0	1	0	$\frac{2}{5}$	0	$\frac{1}{5}$	5
$P$	0	0	0	$\frac{1}{5} + \frac{2}{5}k$	0	$-\frac{2}{5} + \frac{1}{5}k$	$5k + 2$

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

## Spare copy

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



**Question 7 continued**

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Handwritten response area consisting of approximately 30 horizontal lines.

**(Total for Question 7 is 15 marks)**

**TOTAL FOR PAPER IS 75 MARKS**

