

FOR OFFICIAL USE



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National  
Qualifications  
2022

Mark

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**X823/77/01**

**Engineering Science  
Answer booklet**

WEDNESDAY, 18 MAY

1:00 PM – 3:30 PM



\* X 8 2 3 7 7 0 1 \*

Fill in these boxes and read what is printed below.

Full name of centre

--

Town

--

Forename(s)

--

Surname

--

Number of seat

--

Date of birth

Day

--	--

Month

--	--

Year

--	--

Scottish candidate number

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Write your answers clearly in this answer booklet. You must clearly identify in the margin the question number you are attempting.

**Worksheets for questions 3 (b), 4 (a) and 9 (a) are included.** Write your answers to these questions clearly in the spaces provided.

Use **blue** or **black** ink. Sketches, diagrams and graphs may be drawn in pencil.

Before leaving the examination room you must give this booklet to the Invigilator; if you do not, you may lose all the marks for this paper.



\* X 8 2 3 7 7 0 1 0 1 \*

Worksheet for question 3 (b)

Stage	Precedents	Duration
A	----	4
B	----	1
C	B	4
D	A, B	7
E	C	3
F	E	6
G	A, C	7
H	D, F, G	3

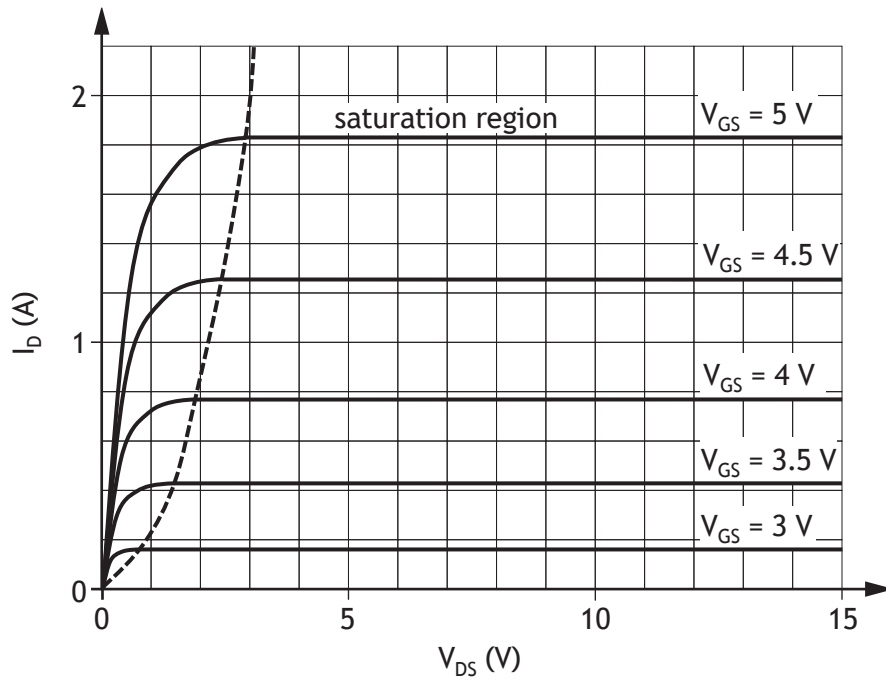
(i)

		Week															
Stage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
A	■	■	■	■	F	F	F										
B	■																
C		■	■	■	■												
D					■	■	■	■	■	■		F	F	F			
E						■	■	■									
F									■	■	■	■	■	■			
G																	
H																	

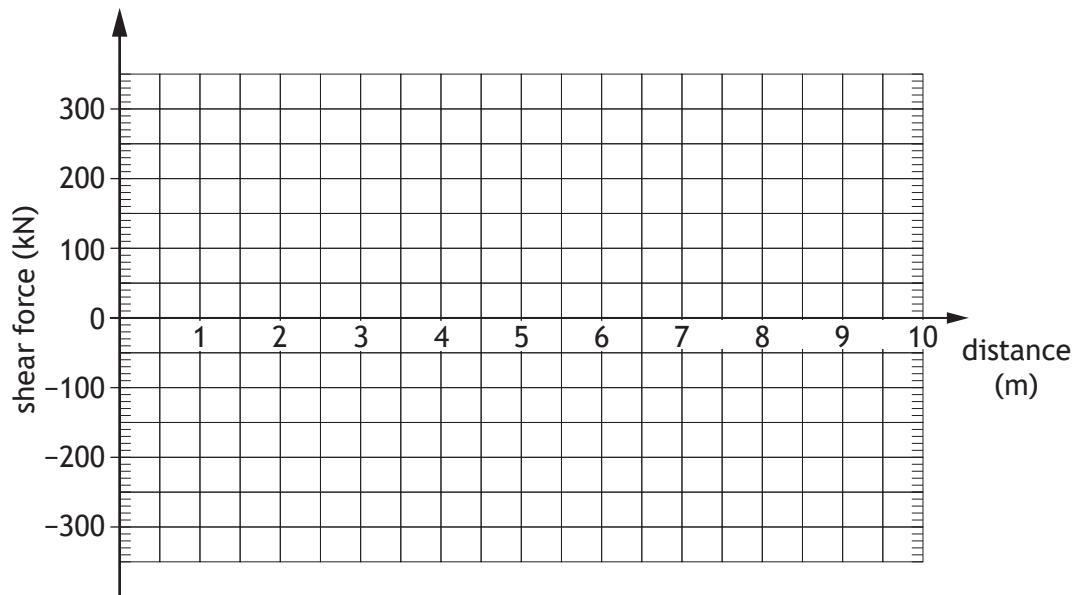
(ii) Critical path \_\_\_\_\_



Worksheet for question 4 (a)



Worksheet for question 9 (a)



ENTER  
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OF  
QUESTION

DO NOT  
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MARGIN



\* X 8 2 3 7 7 0 1 0 4 \*



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\* X 8 2 3 7 7 0 1 0 5 \*

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\* X 8 2 3 7 7 0 1 0 8 \*



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\* X 8 2 3 7 7 0 1 0 9 \*

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\* X 8 2 3 7 7 0 1 1 2 \*



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\* X 8 2 3 7 7 0 1 1 3 \*

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\* X 8 2 3 7 7 0 1 1 4 \*



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\* X 8 2 3 7 7 0 1 1 5 \*

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\* X 8 2 3 7 7 0 1 1 6 \*



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\* X 8 2 3 7 7 0 1 1 7 \*

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\* X 8 2 3 7 7 0 1 1 8 \*

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\* X 8 2 3 7 7 0 1 1 9 \*

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\* X 8 2 3 7 7 0 1 2 0 \*

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\* X 8 2 3 7 7 0 1 2 1 \*



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\* X 8 2 3 7 7 0 1 2 3 \*

