



Please write clearly in block capitals.

Centre number

--	--	--	--	--

Candidate number

--	--	--	--

Surname

---

Forename(s)

---

Candidate signature

---

# Level 3 Certificate

## MATHEMATICAL STUDIES

Paper 2B Critical path and risk analysis

Wednesday 25 May 2016

Morning

Time allowed: 1 hour 30 minutes

### Materials

For this paper you must have:

- a clean copy of the Preliminary Material and formulae sheet (enclosed)
- a scientific calculator or a graphics calculator
- a ruler.

### Instructions

- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer questions in the space provided. Do not write outside the box around each page or on blank pages.
- Show all necessary working; otherwise, marks for method may be lost.
- Do all rough work in this book. Cross through any work that you do not want to be marked.
- The **final** answer to questions should be given to an appropriate degree of accuracy.
- You may **not** refer to the copy of the Preliminary Material that was available prior to this examination. A clean copy is enclosed for your use.

### Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60.
- You may ask for more answer or graph paper, which must be tagged securely to this answer booklet.
- The paper reference for this paper is 1350/2B.



J U N 1 6 1 3 5 0 2 B 0 1

PB/Jun16/E5

**1350/2B**

Answer **all** questions in the spaces provided.

**1** Use **Facebook Facts** on page 2 of the Preliminary Material.

**1 (a)** According to the article, Facebook had 1230 million monthly active users worldwide by the end of 2013

Circle 1230 million written in standard form.

**[1 mark]**

$1230 \times 10^6$

$1.23 \times 10^7$

$1.23 \times 10^8$

$1.23 \times 10^9$

**1 (b)** Suggest **two** improvements that could be made to the presentation of the bar chart in the article.

**[2 marks]**

Improvement 1

---

---

---

---

---

Improvement 2

---

---

---

---

---













**3** After a passenger plane lands at an airport there is a limited amount of time to get the plane ready for its next flight.

The table shows the activities after a plane lands at an airport.

It also shows

- the length of time taken for each activity
- the earliest start time for each activity
- the latest finish time for each activity.

Task	Activity	Length of time taken (minutes)	Earliest start time	Latest finish time
A	Plane taxis from runway after landing	12	0	12
B	Arriving passengers disembark	20	12	32
C	Arriving luggage is taken from hold	30	12	48
D	Plane is refuelled	18	12	42
E	Rubbish is collected and trays wiped	10	32	42
F	Departing luggage transported to hold	40	42	82
G	Drinks and snacks trolley re-stocked	7	42	49
H	Technical safety checks performed	30	42	92
I	Departing passengers embark	35	49	84
J	Luggage hold checked and sealed	4	82	92
K	Passenger safety checks	8	84	92
L	Plane taxis to runway for take off	12	92	104

**3 (a)** Draw a Gantt chart for the process.

**[4 marks]**

---



---



---







3 (b) Which task has the largest float time?  
Circle your answer.

[1 mark]

C

D

H

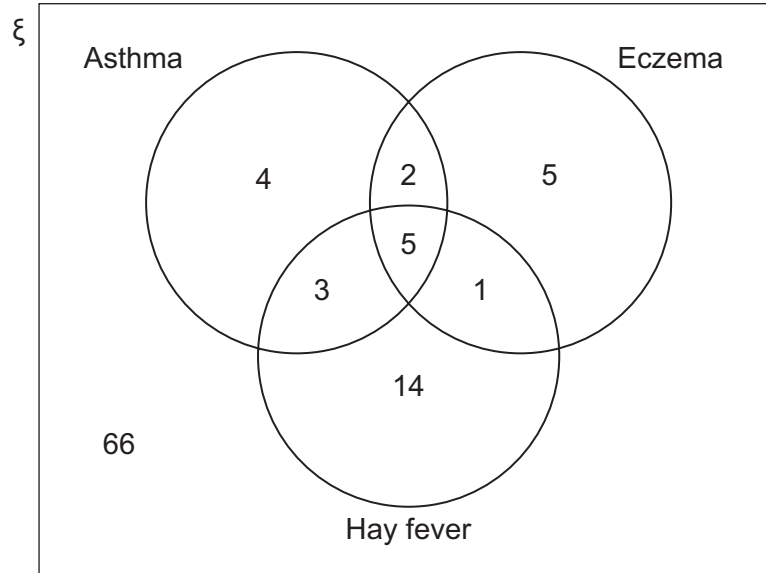
J

Turn over ►



- 4 A person may suffer from one or more of the linked medical conditions asthma, eczema and hay fever.

The Venn diagram shows the percentages of people in the UK who suffer from these conditions.



- 4 (a) Calculate the probability that a person who suffers from eczema also suffers from hay fever.

[2 marks]

---



---



---



---

Answer \_\_\_\_\_



A new brand of indigestion medication is made.  
This indigestion medication cannot be taken with hay fever medication.

- 4 (b) Use the Venn diagram to calculate the probability that a person in the UK, chosen at random, can take the indigestion medication.

[2 marks]

---

---

---

---

---

---

---

---

---

---

Answer \_\_\_\_\_

- 4 (c) Give a reason why the actual probability might be higher than the probability calculated in part (b).

[1 mark]

---

---

---

---

---

Turn over for the next question

Turn over ►









**6 (b)** If Lila decides to sell food at the agricultural show she can buy rain insurance.  
The insurance costs £100  
If Lila buys the insurance and it rains on 23 July she will receive a payment of £300  
Give a reason why Lila should **not** buy the insurance.  
You **must** show working to justify your answer.

**[3 marks]**

---

---

---

---

---

---

---

---

**Turn over for the next question**

**Turn over ►**



7 Dan and his friends are planning a one-day music festival.  
They have divided the work into a number of activities.  
The table below shows

- the activities
- the immediate predecessors of each activity
- the number of days needed to complete each activity.

Task	Activity	Immediate predecessors	Number of days
A	Choose and book the venue	–	3
B	Apply for a licence	A	21
C	Book musicians	B	20
D	Make publicity material	C	5
E	Print and give out flyers	D	2
F	Print tickets	B	3
G	Advertise on social media	D	1
H	Sell tickets	E, F, G	10
I	Organise transport and hospitality	C	15
J	Book food stalls	B	10
K	Prepare the venue	J	5
L	Hold the festival	H, I, K	1





**7 (a)** Construct an activity network for this project.

Show the earliest start time and latest finish time for each activity.

**[10 marks]**

**Question 7 continues on the next page**

**Turn over ►**



7 (b) List the critical path.

[1 mark]

Answer \_\_\_\_\_

7 (c) Dan finds out that organising transport and hospitality takes 20 days instead of 15 days.  
Work out the new minimum completion time for the project.

[3 marks]

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Answer \_\_\_\_\_ days

**END OF QUESTIONS**



**There are no questions printed on this page**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**



**There are no questions printed on this page**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**

**Copyright information**

For confidentiality purposes, from the November 2015 examination series, acknowledgements of third party copyright material will be published in a separate booklet rather than including them on the examination paper or support materials. This booklet is published after each examination series and is available for free download from [www.aqa.org.uk](http://www.aqa.org.uk) after the live examination series.

Permission to reproduce all copyright material has been applied for. In some cases, efforts to contact copyright-holders may have been unsuccessful and AQA will be happy to rectify any omissions of acknowledgements. If you have any queries please contact the Copyright Team, AQA, Stag Hill House, Guildford, GU2 7XJ.

Copyright © 2016 AQA and its licensors. All rights reserved.

