



Examination Answer Books

12 Pages

Instructions to Candidates

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right, fold over and seal down (using the label provided) to hide your name.
3. The answers must be legibly written. The Examiners can either ignore illegible script or have it typed and the expense of typing charged to the candidate.
4. Write your answers in ink.
5. Begin each answer on a fresh page. Do all rough work in the answer book and cross it through.
6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
8. Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.

Complete, fold and seal
(see note 2 below)

SURNAME:

Rowlands

FORENAME(S):

William

Robert Etienne

1	Student Number	1702688
2	Title of Examination Paper	Engineering Science
3	Module Code	MLX02192
4	Date and Time of Examination	11am 3/04/19
5	Examination Venue	IQ Venue 106
6	Seat Number	
7	Number of Answer Books handed in	1

List the numbers of the questions you have attempted	Office Use	
1	1	8
2	6	11
3	4	10
4	9	10
Total	20	39

Inv'd Tina Tudon

51%.



1 $A = 600 \times 465 \leftarrow$ Base units.

$h = 55 \text{ kW} \times \leftarrow = Q$

$Q = 11000 \times = h. \quad Q = h \times A \times (T_2 - T_1)$

$$\frac{Q}{h \times A} = T_2 - T_1 = 71.68^\circ$$

①

Workings ?!

2.

$A = \cancel{0.4 \times 0.1 \times 0.025} \times 0.025$
 $0.4 \times 0.1 \times 0.025$

$F = 250 \text{ N}$

$x = 2 \text{ mm} = 0.002$

a) $\frac{F}{A} = \tau$

①.

$\frac{250}{0.4 \times 0.1 \times 0.025} = 250000 \text{ N}$

$\leftarrow$ You have calculated a volume.

b) $y = \frac{x}{L}$

$\frac{0.002}{100} = 2 \times 10^{-4}$

✓

③ ④

c) $G = \frac{\tau}{y} = 250000000$

$\frac{250000}{2 \times 10^{-4}} =$ ①

250000000

6/11

3

$$L = 0.75 \text{ m}$$

$$T = 1200 \text{ Nm}$$

$$G = 210 \text{ GPa}$$

$$r = 0.0005$$

$$J = \frac{\pi D^4}{32}$$

$$A = \frac{\pi d^2}{4}$$

$$\frac{T}{J} = \frac{\tau}{r} = \frac{G\theta}{L}$$

$$\tau = \frac{F}{A}$$

$$T \cdot r = \tau \cdot J$$

$$\frac{T \cdot D}{2}$$

$$\frac{T \cdot 1}{2} = \tau \cdot \frac{\pi D^4}{32}$$

$$\frac{T}{J} = \frac{G\theta}{L}$$

$$\frac{T \cdot 16}{2} = \tau \cdot \frac{\pi D^3}{32}$$

$$\frac{T \times L}{G\theta} = \frac{G\theta \times J}{G}$$

4.

$$T \cdot 16 = \pi D^3 \cdot \tau$$

$$\sqrt[3]{\frac{T \cdot 16}{\pi \cdot \tau}} = D$$

$$\sqrt[3]{\frac{1200 \times 16}{\pi}}$$

$$\frac{T \times L}{G\theta} = \frac{\pi D^4}{32}$$

you made
that complicated!

$$\sqrt[4]{\frac{T \times L \times 32}{\pi \times G \times \theta}} = 37.375 \text{ m}$$

X.

$$4) d = 15 \text{ mm}$$

$$E =$$

$$L = 0.25 \text{ m}$$

$$F = 273 \text{ N}$$

$$e = \frac{x}{L}$$

$$\sigma =$$

$$x = 0.0035 \text{ mm}$$

$$A = \frac{\pi d^2}{4} = 1.76 \times 10^{-4} \quad \text{①}$$

workings?

not sure if I times it by 0.25?

$$\sigma = \frac{F}{A} = \frac{273}{1.76 \times 10^{-4}} \quad \text{①}$$

$$= 151136.364$$

$$e = \frac{0.0035 \times 10^{-3}}{0.25 \text{ m}} = 1.4 \times 10^{-5} \quad \checkmark \quad \text{③}$$

$$E = \frac{\sigma}{e} = \frac{151136.364}{1.4 \times 10^{-5}} \quad \text{④}$$

$$10.7 \times 10^9 \text{ Nm}$$

Carried error
Incorrect units.

Question No.

Examiner On

Arholwr yn unig

ff y Cwestiwn

Question No.

Examiner On

Arholwr yn unig

hif y Cwestiwn

Question No.

Examiner Only

Question No.

Examiner Only

Question No.

Examiner Only

Arholwr yn unig

Yn unig y Cwestiwn



Question No.

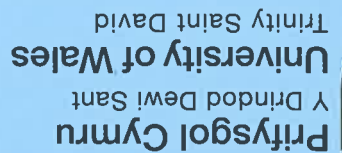
Examiner Only

Question No.

Examiner Only

Arholwr yn unig

Arholwr yn unig



12 Tudalen

1. Rhwch yr holl wybodaeth y gofynnir amdani yn y blychau isod.
2. Rhwch eich enw yn y lle a ddarparwyd ar y dde, plygwch ef a'i selio i lawr (gan ddefnyddio'r label a ddarparwyd) i guddio'ch enw.

1. Rhaid i'r atebion fod mewn llawysgrifên ddarlennadwy. Gall yr Arholwyr naill ai anwybyddu sgrïp annarllenadwy, neu drefnu iddi gael ei theipio a chael yr ymgeisydd i dalu.
2. Rhaid dychwelyd pob llyfr. Ni chaniateir mynd â llyfrau atebion, wedi eu defnyddio neu heb eu defnyddio, allan o'r lleoliad arholi o dan unrhyw amgylchiadau.
3. Os defnyddir mwy nag un llyfr, rhwymwch hwy gyda'i gilydd gan ddefnyddio'r tagiau sydd ar gael oddi wrth y gwyllwyr/gwyliwyr.
4. Ni ddylid rhwygo unrhyw ran o'r llyfr hwn; rhaid ei gyflwyno yn gyfan.
5. Dechreuwch bob ateb ar dudalen newydd. Gwnewch unrhyw fras nodiadau yn y llyfr atebion a thynnu llinell drwyddynt.
6. Ysgrifennwch eich atebion mewn inc.
7. Rhaid dychwelyd pob llyfr. Ni chaniateir mynd â llyfrau atebion, wedi eu defnyddio neu heb eu defnyddio, allan o'r lleoliad arholi o dan unrhyw amgylchiadau.

7	Nifer y Llyfrau Atebion a gyflwynwyd	
6	Rhif Sedd	
5	Lleoliad yr Arholiad	
4	Dyddiad ac Amser yr Archoliad	
3	Cod y Modwl	
2	Teitl y Papur Arholiad	
1	Rhif Myfyrwr	

[illegible]

(See the other side for English version)

Llenwch, plygwrch a seliwrch
(gweler nodyn 2 isod)

CYFENW:

ENW(AU) CYNTAF:

ENW(AU) CYNTAF: