

90948M



909485



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

SUPERVISOR'S USE ONLY

Pūtaiao, Kaupae 1, 2014

90948M Te whakaatu māramatanga ki ngā ariā koiora e pā ana ki te rerekētanga ā-ira

9.30 i te ata Rāhina 10 Whiringa-ā-rangi 2014
Whiwhinga: Whā

Paetae	Kaiaka	Kairangi
Te whakaatu māramatanga ki ngā ariā koiora e pā ana ki te rerekētanga ā-ira.	Te whakaatu māramatanga hōhonu ki ngā ariā koiora e pā ana ki te rerekētanga ā-ira.	Te whakaatu māramatanga matawhānui ki ngā ariā koiora e pā ana ki te rerekētanga ā-ira.

Tirohia mehemea e ōrite ana te Tau Ākonga ā-Motu (NSN) kei tō pepa whakauru ki te tau kei runga ake nei.

Me whakautu e koe ngā pātai KATOA kei roto i te pukapuka nei.

Ki te hiahia koe ki ētahi atu wāhi hei tuhituhi whakautu, whakamahia te (ngā) whārangi kei muri i te pukapuka nei, ka āta tohu ai i ngā tau pātai.

Tirohia mehemea kei roto nei ngā whārangi 2–25 e raupapa tika ana, ā, kāore hoki he whārangi wātea.

HOATU TE PUKAPUKA NEI KI TE KAIWHAKAHAERE HEI TE MUTUNGA O TE WHAKAMĀTAUTAU.

TAPEKE


MĀ TE KAIMĀKA ANAKE

(a) Tapaina ngā pāpāhua kore tapanga A, G, C, T rānei i roto i te hoahoa pītauira e whakaaturia ana i raro nei.



(a) Label the unlabelled bases A, G, C, or T in the diagram of DNA shown below.



- 
- Tipu A
- Tipu B

He wāhi anō mō tō whakautu

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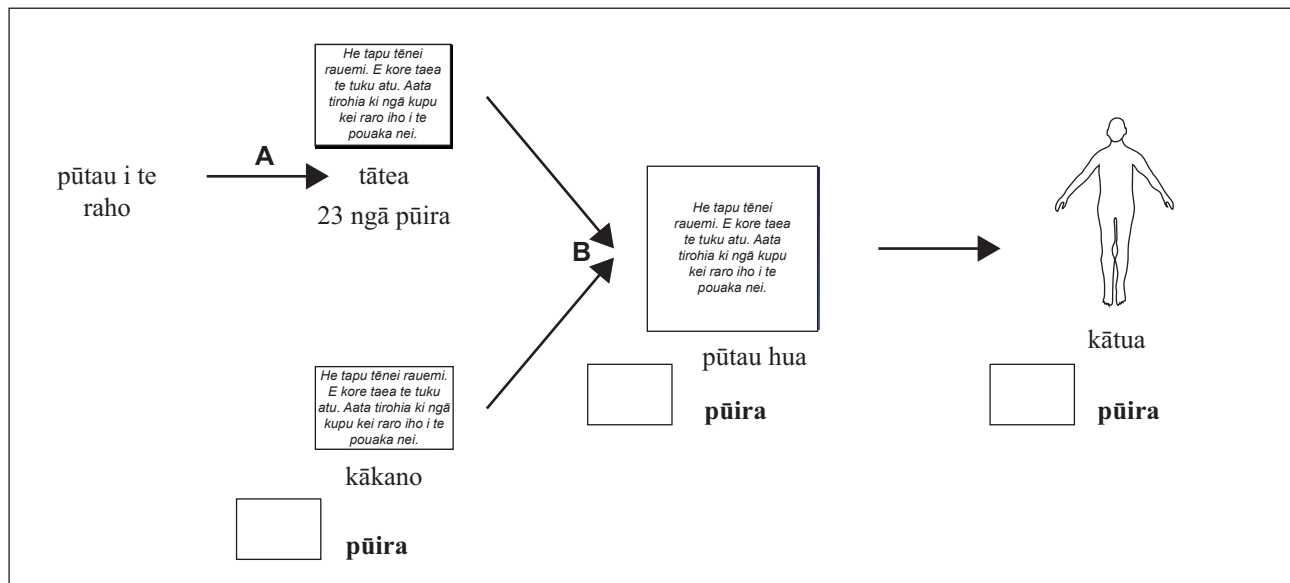
-
- The diagram shows two potted plants, Plant A and Plant B, illustrating the effect of light intensity on photosynthesis. Plant A is smaller and has fewer leaves, while Plant B is larger and has more leaves, indicating higher photosynthetic activity.

There is more space for your answer to this question on page 7.

Science 90948, 2014

PĀTAI TUARUA: TE REREKĒTANGA I WAENGA TĀNGATA

E whakaatu ana te hoahoa i raro i te hononga i waenga i ngā tohuhema (pūtau hema), ngā pūtau hua, me te tau pūira i roto i te tangata.



mātāpuna: www.thedrinksbusiness.com/wordpress/wp-content/uploads/2014/03/more-sperm.jpg

<http://scm-l3.technorati.com/11/10/27/55025/zygote.jpg?t=20111027092220>

<http://static.guim.co.uk/sys-images/Guardian/About/General/2011/10/17/1318873301247/A-human-ovum-in-the-fallo-007.jpg>

(a) Whakaingoatia ngā tukanga e tohua ana e **A** me **B**:

Tukanga A: _____

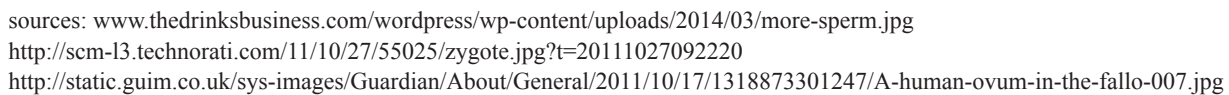
Tukanga B: _____

(b) Whakaotihia te hoahoa i runga ake mā te tuhi i ngā tau o ngā pūira ki ngā pouaka.

(c) Whakatauritea te tau pūira o te kākano, te tātea, te pūtau hua me te kātua, \bar{A} , whakamāramahia ngā rerekētanga me ngā ōritetanga i roto i ngā tau.

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The diagram below shows the relationship between gametes (sex cells), zygotes, and chromosome number in humans.



- Process B: _____

- (c) Compare the chromosome number of the egg, sperm, zygote and adult, AND explain any differences and similarities in the numbers.

(d) Two brothers, who have the same parents and are not identical twins, will have different genotypes and phenotypes.

(i) Define the term genotype.

(ii) Define the term phenotype.

(iii) Explain how the two brothers with the same parents can have different genotypes.

In your answer you should explain:

- the importance of meiosis
- the role of fertilisation.

**There is more space for your
answer to this question on
page 13.**

PĀTAI TUATORU: TE WHAKATUPU KARAREHE

Ko te whai a te kaiwhakatupu kararehe he whakaputa hipi wūru mā, ēngari ka puta i ētahi hipi mā ngā reme wūru pango.

I te nuinga o te wā ka whakamahia e ngā kaiwhakatupu kararehe te hipi toa kotahi hei whakaeke i ā rātau hipi uwaha katoa.

*He tapu tēnei rauemi. E
kore taea te tuku atu. Aata
tirohia ki ngā kupu kei raro
iho i te pouaka nei.*

*He tapu tēnei rauemi. E
kore taea te tuku atu. Aata
tirohia ki ngā kupu kei raro
iho i te pouaka nei.*

<http://dansperry.com/wp/wp-content/uploads/2013/02/sheep.jpg>

<http://verrasnotebook.typepad.com/.a/6a00e54fd05e9e8834010534be51f4970b-p>

- (a) Homai ngā tohuira katoa ka taea mō ia tohuāhua.

Whakamahia a ‘A’ hei tohu i te āhuaira ngoi³ mō te wūru mā, me te ‘a’ hei tohu i te āhuaira ngoikore⁴ mō te wūru pango.

Wūru mā: _____

Wūru pango: _____

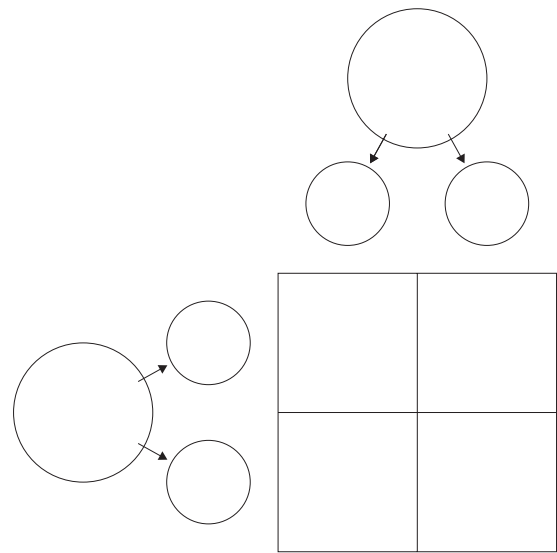
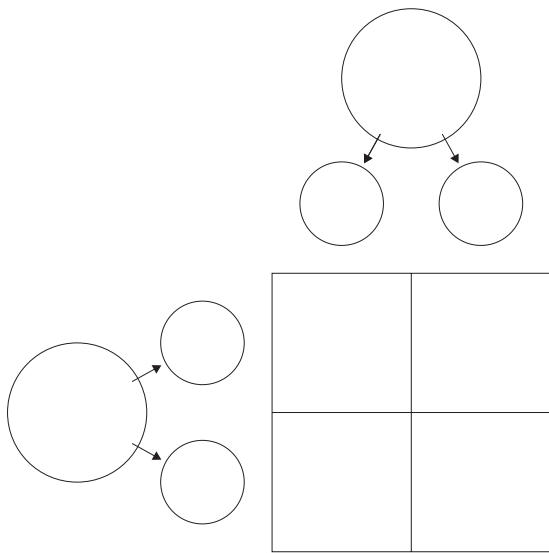
- (b) Matapakitia he pēhea te whakawhanake a tētahi kaipāmu i ētahi hipi e whakatupu horomatatia ana mō te wūru mā.

I tō whakautu, me:

- tuhi ngā tohuira o te hipi toa me te hipi uwaha hei whakamahi mā te kaipāmu hei whakatupu hipi
- whakamārama he pēhea te kaiwhakatupu kararehe e whakatau ai i ngā tohuira o te toa me te uwaha kia puta ai he hipi wūru mā katoa.
Me homai e koe ngā tūtohi Punnett e rua, neke atu rānei, i tō whakamāramatanga.
- whakamārama ka pēhea te whakarite a te kaiwhakatupu kararehe kia whakatupu horomatatia ngā uri katoa.

³ tāpua

⁴ huna



MĀ TE
KAIMĀKA
ANAKE

QUESTION THREE: ANIMAL BREEDINGASSESSOR'S
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An animal breeder wanted to produce sheep with white wool, but some white sheep produce lambs that have black wool.

Animal breeders often use one male sheep to mate with all their female sheep.

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reproduced here.*

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reproduced here.*

<http://dansperry.com/wp/wp-content/uploads/2013/02/sheep.jpg>

<http://verrasnotebook.typepad.com/.a/6a00e54fd05e9e8834010534be51f4970b-p>

- (a) Give all possible genotypes for each phenotype.

Use **A** to represent the dominant allele for common white wool, and **a** to represent the recessive allele for black wool.

White wool: _____

Black wool: _____

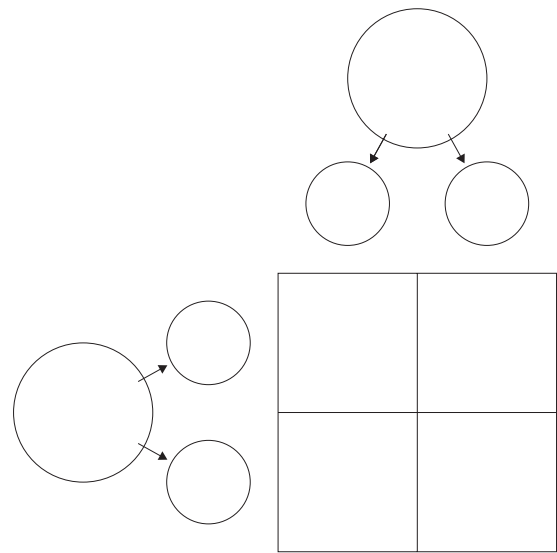
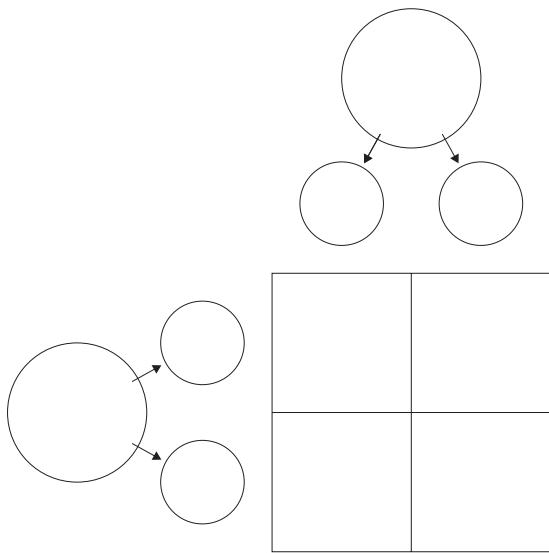
- (b) Discuss how a farmer could develop a group of sheep that are pure breeding for white wool.

In your answer you should:

- state the genotypes of the male and female sheep the farmer should use to breed from
- explain how the animal breeder can determine the genotypes of the male and female to produce sheep that all have white wool.

You should include at least two Punnett squares with your explanation

- explain how the animal breeder could make sure that the offspring would always be pure breeding.



ASSESSOR'S
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PĀTAI TUAWHĀ: WHAKAPAPA

*He tapu tēnei rauemi. E
kore taea te tuku atu. Aata
tirohia ki ngā kupu kei raro
iho i te pouaka nei.*

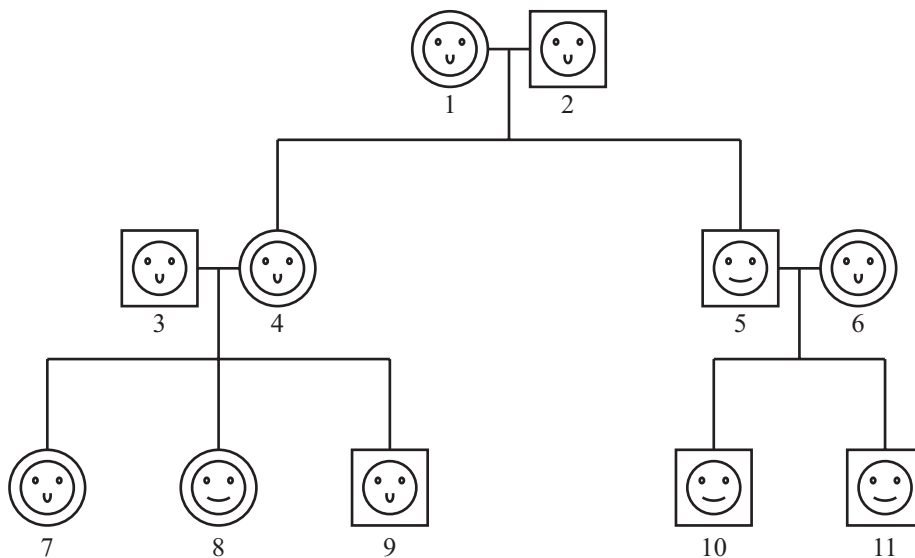
*He tapu tēnei rauemi. E
kore taea te tuku atu. Aata
tirohia ki ngā kupu kei raro
iho i te pouaka nei.*

Kāore e pōkai arero

Pōkai arero.

<http://staff.gpschools.org/speirss/meapcontent/responses/inherit.htm>

I roto i te whakapapa i raro nei, ka tohua te hunga pōkai arero hei ☺, ā, ko te hunga kāore e pōkai arero hei ☹.



Whakamahia ngā pū **T** me **t** hei tohu i ngā āhuaira pōkai arero (**T**) me te kore pōkai arero (**t**).

(a) (i) Whakamahia te whakapapa i raro hei whiriwhiri i te tohuira o te tangata 5.

(ii) Whakamāramahia mai i pēhea tō whiriwhiri i tēnei.

(b) Whakamahia te whakapapa hei whakamārama i te take ko te tangata 6 he Tt.

**Ka haere tonu te Pātai
Tuawhā i te whārangi 22.**

QUESTION FOUR: FAMILY TREE

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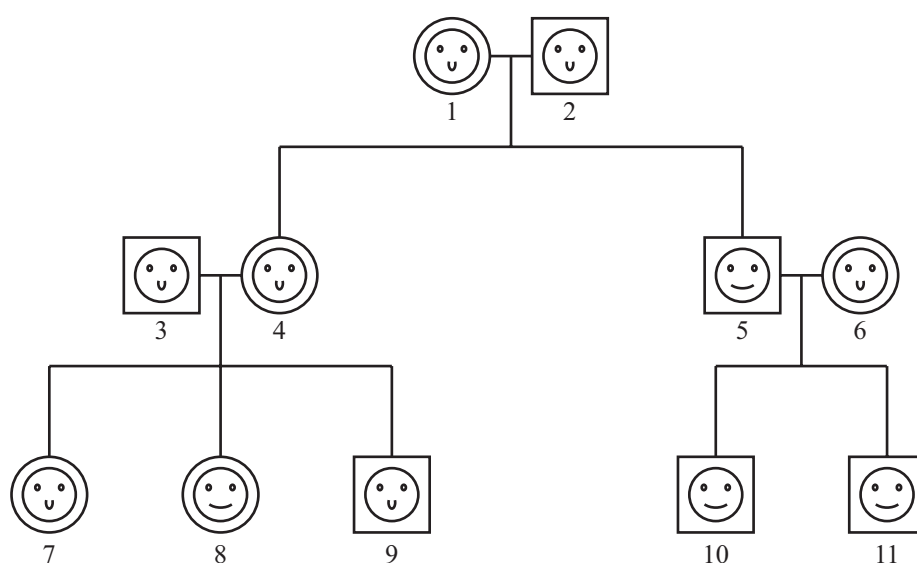
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Non tongue roller.

<http://staff.gpschools.org/speirss/meapcontent/responses/inherit.htm>

Tongue roller.

In the family tree below, people who are tongue rollers are shown as ☺, while those who cannot roll their tongue are shown as ☹.



Use the letters **T** and **t** to represent the alleles for tongue rolling (**T**) and non rolling (**t**).

- (a) (i) Use the family tree above to work out the genotype of individual 5.

- (ii) Explain how you worked this out.

(b) Use the family tree to explain why individual 6 must be **Tt**.

**Question Four continues
on page 23.**

(c) Whakamāramahia mai he aha i noho ai ngā tohuira mō ngā tāngata 3 me te 4 ko te **Tt**.

I tō whakautu, me:

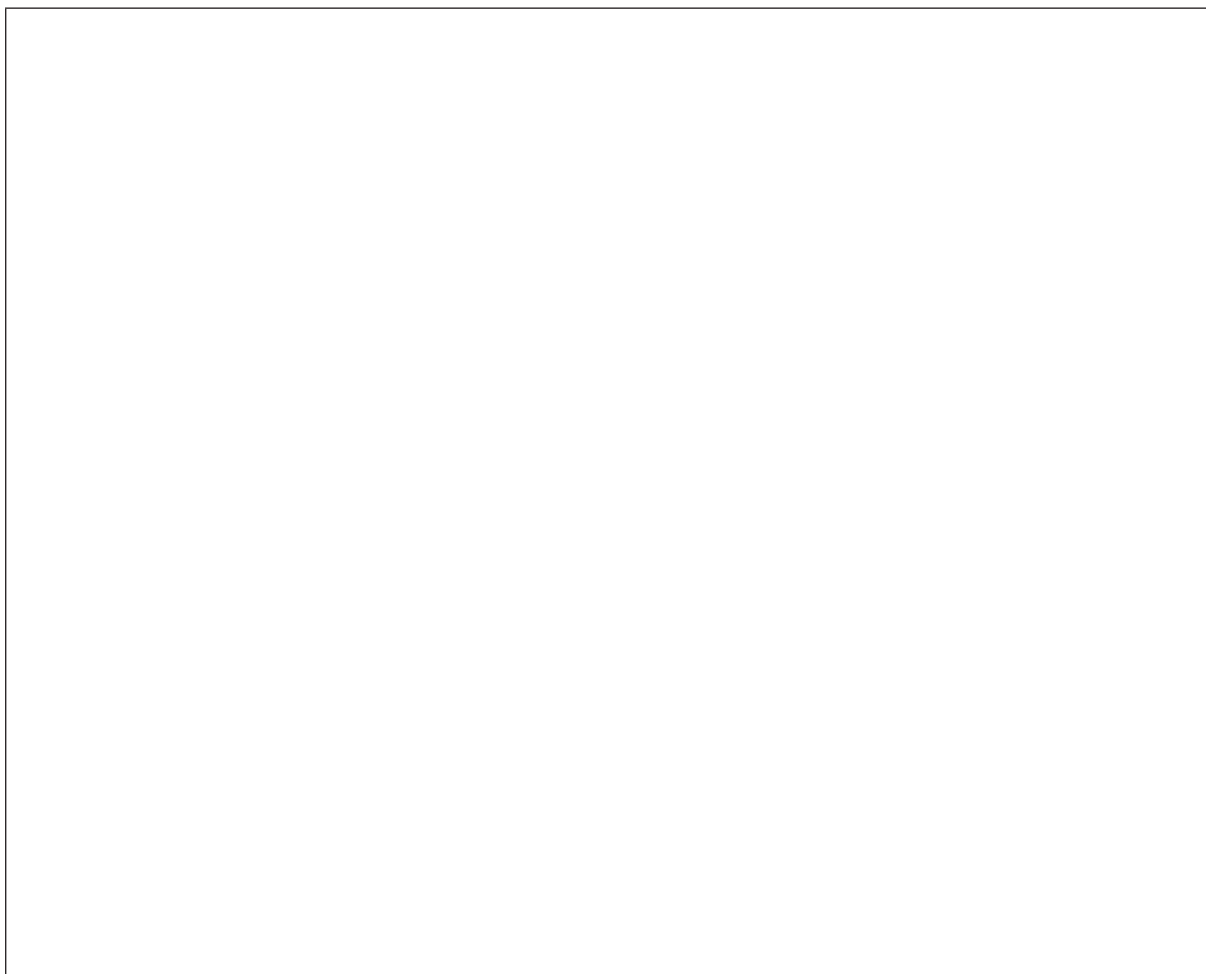
- tuhi ngā tūtohi Punnett i te pouaka i raro nei
- whakamārama te take **ēhara** ko te **TT**, te **tt** rānei ngā tohuira mō ngā tāngata 3 me te 4.



- (c) Explain why the genotypes for individuals 3 and 4 both must be **Tt**.

In your answer you should:

- draw Punnett squares in the box below
- explain why the genotypes of individuals 3 and 4 **cannot** be **TT** or **tt**.



He puka anō mēnā ka hiahiatia.
Tuhia te (ngā) tāu pātai mēnā e hāngai ana.

TAU PĀTAI

MĀ TE
KAIMĀKA
ANAKE

Extra paper if required.
Write the question number(s) if applicable.

QUESTION
NUMBER

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English translation of the wording on the front cover

Level 1 Science, 2014

90948 Demonstrate understanding of biological ideas relating to genetic variation

9.30 am Monday 10 November 2014
Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of biological ideas relating to genetic variation.	Demonstrate in-depth understanding of biological ideas relating to genetic variation.	Demonstrate comprehensive understanding of biological ideas relating to genetic variation.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL the questions in this booklet.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–25 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.