PYMBLE LADIES' COLLEGE

YEAR 10 SCIENCE EXAMINATION

SEMESTER II, 2006

TIME ALLOWED: 1½ HOURS

DIRECTIONS TO CANDIDATES:

Attempt ALL questions.

THIS PAPER IS IN TWO SECTIONS:

SECTION A	Questions 1- 20	Multiple Choice Questions.	20 marks
SECTION B	Questions 21 - 35	Short Response Questions.	60 marks

All answers to be written in the spaces provided.

SHOW ALL WORKING FOR CALCULATED ANSWERS

SECTION A

Questions 1-20 Multiple Choice [1 mark each]

For questions 1-20, choose the <u>best</u> of the four possible answers and indicate your choice by placing a CROSS [X] in the appropriate space on the grid in the Answer Book provided.

1. The weight and mass of an object are measured on the Moon and on Earth. The Moon has less gravity than Earth. Which of the following statements is correct?

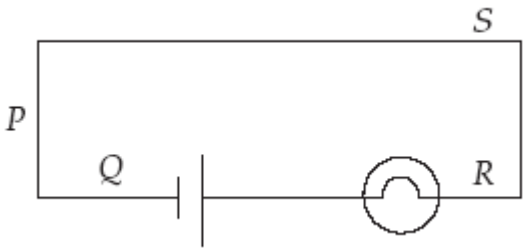
   A. The object's mass is greater on the Moon.

   B. The object's mass is smaller on the Moon.

   C. The object's weight is greater on the Moon.

   D. The object's weight is smaller on the Moon.

2. The diagram shows an electrical circuit.



Which of the following statements about the current in the circuit is correct?

   A. It is zero at *S*.

   B. It is equal at *Q* and *S*.

   C. It is less at *R* than at *S*.

   D. It is greater at *Q* than at *P*.

3. The diagram shows an ammeter that is connected in a circuit.



What is the reading on the ammeter in amps?

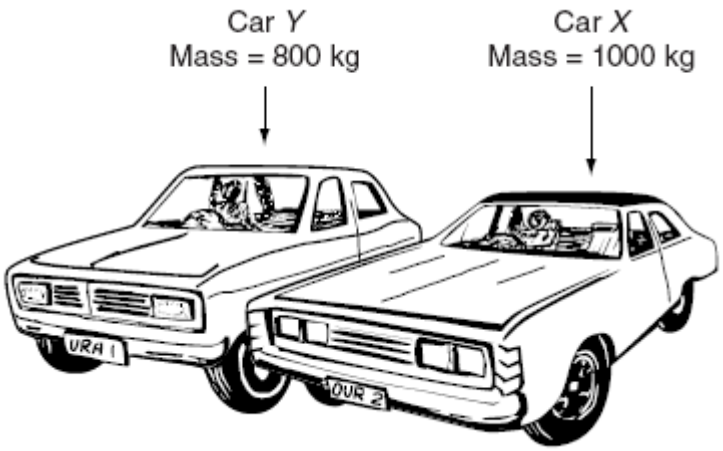
A. 1 amp

B. 1.2 amps

C. 1.1 amps

D. 11 amps

4. Two cars taking part in a race are lined up at the starting line.



When the starter begins the race, the forces supplied to both cars are equal.

What is the best way to describe the acceleration of each car?

A. Car *Y* should accelerate more than car *X* because car *Y* has less mass.

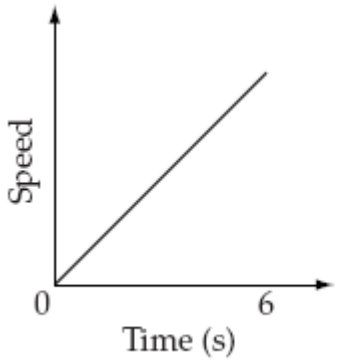
B. Car *X* should accelerate more than car *Y* because car *X* has greater mass.

C. Both cars should accelerate equally because they both start at the same time.

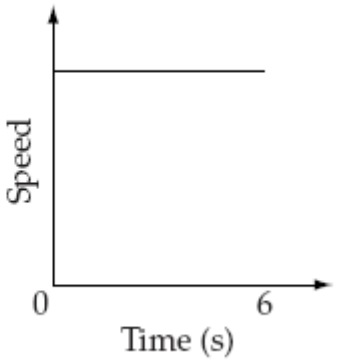
D. Both cars should accelerate equally because they are both experiencing the same force.

5. A constant force acting on a moving trolley brings it to a stop in 6 seconds. Which graph shows the motion of the trolley during the 6 seconds?

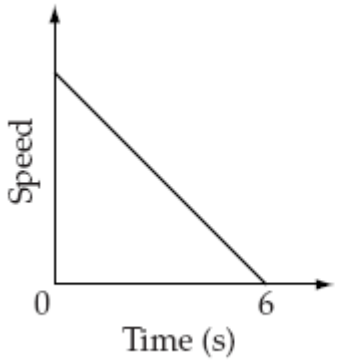
(A)



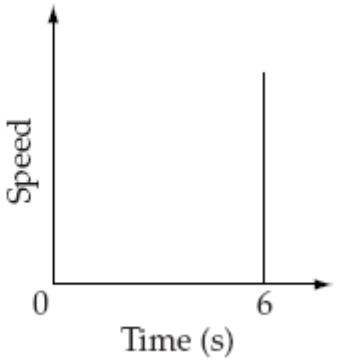
(B)



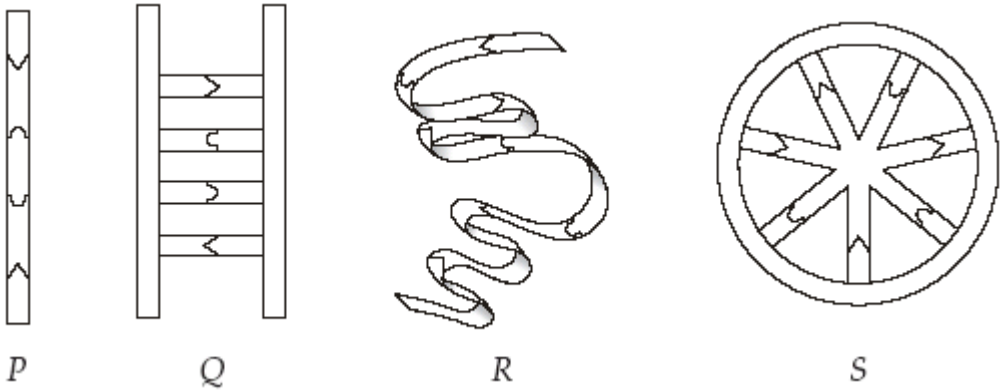
(C)



(D)



Use the diagrams to answer Question 6.



6. Which diagram best represents the Watson-Crick model of DNA?

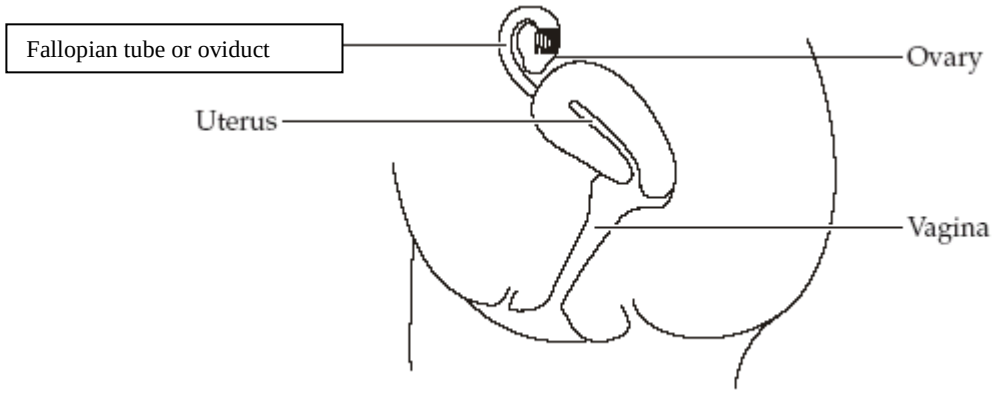
A. P

B. Q

C. R

D. S

Use this diagram of the human female reproductive system to answer Questions 7 and 8.



7. Which choice correctly shows the path that an unfertilised egg takes through the female reproductive system?

A. Oviduct → uterus → ovary → vagina

B. Ovary → oviduct → uterus → vagina

C. Ovary → uterus → oviduct → vagina

D. Vagina → uterus → oviduct → ovary

8. Which of the following occurs in the uterus?

A. An unborn baby grows

B. Eggs are produced

C. Fertilisation

D. Ovulation

Use this information to answer Questions 9 and 10.

> 'Bt cotton' is a genetically modified strain of cotton plant. Each plant cell includes a gene from a soil bacterium, which causes the plant to make a chemical that kills caterpillars when they feed on the plant.

9. What has been transferred from a soil bacterium to Bt cotton plants?

A. DNA

B. Cotton

C. Caterpillars

D. Chromosomes

10. How has the change in Bt cotton been produced?

A. By using insecticides

B. By using radioactivity

C. By using biotechnology

D. By natural selection

11. What type(s) of evidence supports the theory of continental drift?

A. Distributions of fossil plants and animals

B. Distributions of geological structures of the same type and age

C. Jigsaw fit of the continents

D. All of the above features

12. What causes the plates to move apart at mid ocean ridges?

A. Density differences in the crust

B. Gravitational and tidal forces

C. Mantle convection currents

D. Weight of seafloor sediments

13. What does plate tectonic theory predict about the distribution of volcanoes and earthquakes?

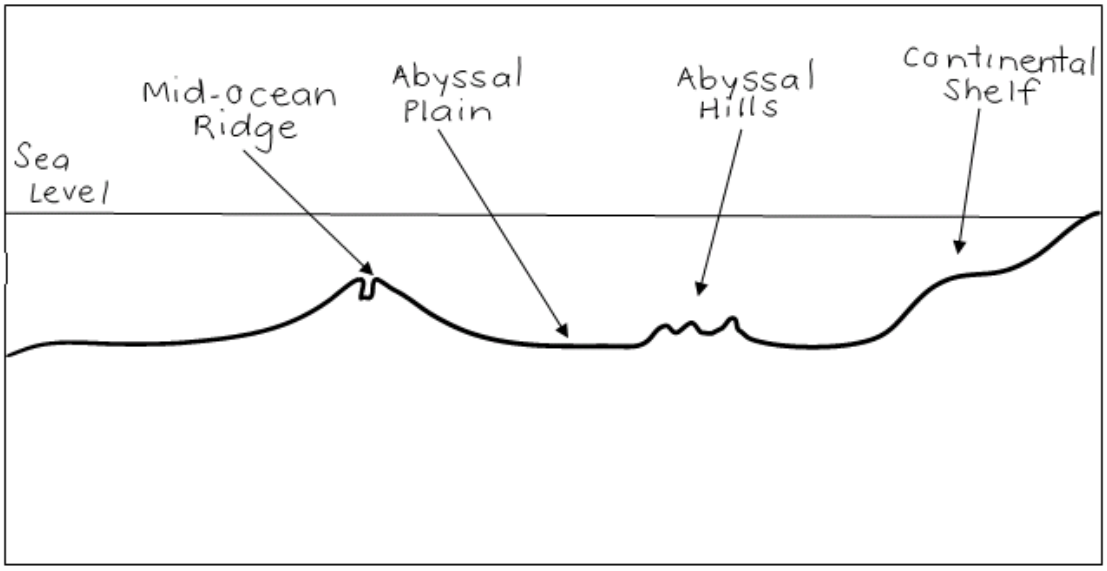
A. They should be evenly distributed throughout the earth.

B. They should occur mainly along plate boundaries.

C. They should occur mainly on continents.

D. They should only occur along the edges of continents.

Use this diagram to answer Question 14.



14. What is the age order of sea floor types from **oldest to youngest**?

A. Continental shelf, abyssal plains, abyssal hills, mid-ocean ridge

B. Abyssal plains, abyssal hills, mid-ocean ridge, continental shelf

C. Continental shelf, abyssal hills, abyssal plains, mid-ocean ridge

D. Mid-ocean ridge, abyssal hills, abyssal plains, continental shelf

15. What do all stars begin as?

A. red giant

B. nebulae

C. supernova

D. white dwarf

16. When ethanol is completely combusted, what products are produced?

A. carbon and carbon monoxide

B. oxygen and water

C. carbon dioxide and water

D. carbon monoxide and oxygen

17. Which of the following is a chemical change?

A. ice melting to become water

B. smoke rising into the air

C. candle wax burning

D. salt dissolving into water

18. What is the best way to describe an Ionic Bond?

A. It is a positive and a negative ion swapping electrons

B. It is an electrostatic attraction between oppositely charged ions.

C. It is sodium chloride

D. It is a bond where electrons are shared.

19. Using the solubility information below, which pair of ions will produce a precipitate?

- All nitrates are soluble
- All carbonates are insoluble except those of Group 1 metals.
- All chlorides are soluble except silver lead and mercury.
- All hydroxides are insoluble except those of Group 1 metals.

A. sodium and hydroxide

B. calcium and carbonate

C. potassium and nitrate

D. magnesium and chloride

20. When iron rusts what compound is formed?

A. Iron oxide

B. Iron hydroxide

C. Iron carbonate

D. Iron sulfide

Name: _____

Please circle your Teacher's Name

MS A BROWNLEE	**MS A BURGESS**
MRS C CHAMBERS	**MS K GILLIES**
MS B HESSEL	**DR M JEFFREYS**
DR S MALANEY	**MRS S MATHIS**
MRS A PARRANTO	**MRS A PATERSON**

PYMBLE LADIES' COLLEGE

YEAR 10 SCIENCE EXAMINATION

SECTION A (1 mark each)

For each question (1 - 20), choose the best of the four possible answers, and indicate your choice by filling in the appropriate space.

1	A	B	C	D
2	A	B	C	D
3	A	B	C	D
4	A	B	C	D
5	A	B	C	D
6	A	B	C	D
7	A	B	C	D
8	A	B	C	D
9	A	B	C	D
10	A	B	C	D
11	A	B	C	D
12	A	B	C	D
13	A	B	C	D
14	A	B	C	D
15	A	B	C	D
16	A	B	C	D
17	A	B	C	D
18	A	B	C	D
19	A	B	C	D
20	A	B	C	D

SECTION B

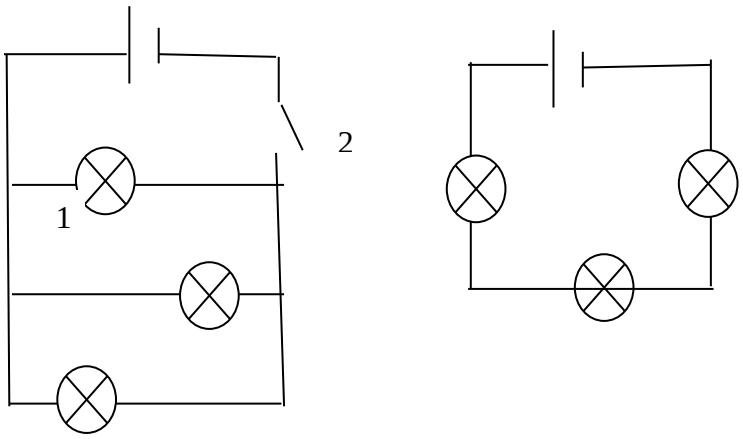
Short Response Questions 21 - 35

Attempt ALL questions

Show all necessary working in questions involving calculations.

Marks

21. [7 marks]



Circuit A

Circuit B

a) Identify the labelled components: **2**

1: _____

2:_____

b) In which circuit are the light bulbs connected in series? _____**1**

c) Draw a Voltmeter in the appropriate position to measure the voltage of one of the light bulbs in circuit B. Use the correct symbol for Voltmeter. **2**

d) Draw an Ammeter in circuit A to measure the total current flowing through the circuit. Use the appropriate symbol. **2**

22. [8 marks]

a) Objects A and B are moving at constant speed. Fill in the missing values for the moving objects in the table below. **2**

Object	**Initial Distance (m)**	**Final Distance (m)**	**Time for change in distance (s)**	**Speed of object (m/s)**
A	0	10	5	
B	0	15		3.0

b) Draw 2 lines plotting Distance against Time (one for each object) on the same set of axes below. **4**

c) If another object starts at 2 m with a speed of 1.5 m/s, how far away will it be after 8 seconds? **2**

23. [4 marks]

a) What is a Mutation? _____**1**

b) State two ways this may occur

_____**2**

_____

_____

c) Why might this be advantageous to the individual? **1**

_____

_____

_____

24. [3 marks]

Draw a table to distinguish between 2 features of Mitosis and Meiosis.

25. [4 marks]

a) Name the section of a chromosome that carries information for a particular characteristic. **1**

_____

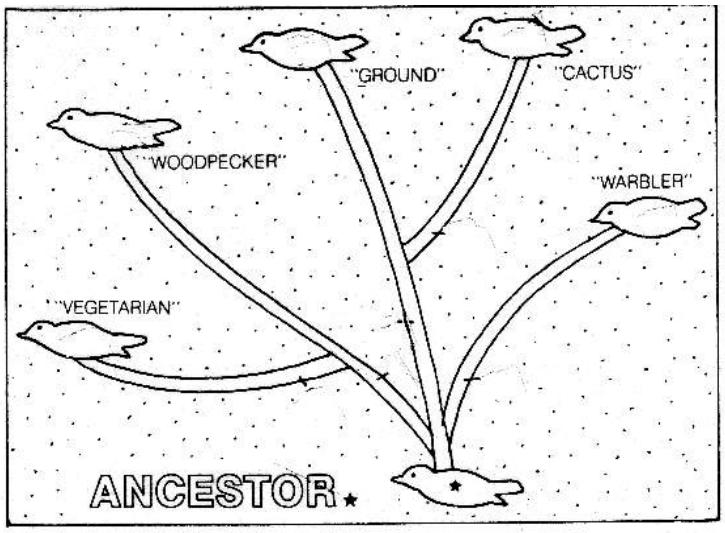
b) A female mouse with the genotype (aa) was mated with a male mouse with the genotype (Aa). Draw a punnet square to work out the genotypes of the offspring. State the ratios of each genotype. **2**

b) Other than its genetics, what may influence the features of an organism?

_____ **1**

26. [4 marks]

a) Darwin observed that the different islands of the Galapagos contained different finches, each with beaks suited to eat different food. He suggested that they all had come from a common ancestor by the process of natural selection. Explain how this occurred?



_____ **4**

_____

_____

_____

_____

_____

27. [3 marks]

Describe the life cycle of a star. **3**

OR

Describe the formation of the solar system.

28. [3 marks]

a) State ONE piece of evidence that supports the "Big Bang" Theory of the origin of the Universe.**1**

b) Explain why the evidence stated above supports the theory. **2**

29. [4 marks]

Sketch a diagram to illustrate an ocean-continent convergent plate boundary. Label at least THREE features which are characteristic of this type of boundary.

30. [5 marks]

a) List the 3 types of waves produced by an earthquake. **1**

_____

b) Which type of seismic (earthquake) wave travels the fastest? _____**1**

c) Between which 2 waves do scientists plot the difference in arrival times to determine how far away from a seismograph station an earthquake has occurred? **1**

_____

d) Define these terms: **2**

Epicentre _____

_____

Focus _____

_____

31. [2 marks]
Given that:

copper (II) ion is Cu^{2+},
sodium ion is Na^{+},
oxygen forms an O^{2-} ion and
chlorine forms the Cl^{-} ion,

write the formula for the following compounds.

Copper (II) chloride _____ **1**

Sodium oxide _____ **1**

32. [5 marks]

Neutralisation is the reaction of an acid with a base.

a) Write the general word equation for this reaction.

_____**1**

b) Name the compounds produced by the neutralisation reaction of hydrochloric acid with potassium hydroxide?

_____**2**

c) Explain how a neutralisation reaction is useful for insect stings. **2**

_____

_____

_____

33. [2 marks]
Name ONE major pollutant and explain why it is considered to be a pollutant. **2**

_____

_____

_____

_____

34. [3 marks]

a) Water from the tap is found to have a pH of about 6. What does this indicate? **1**

b) How is an indicator used to measure pH? **1**

c) What pH would you expect sodium hydroxide to have? **1**

35. [3 marks]
During Year 10 you carried out an experiment to investigate the amount of heat energy released by fuels during combustion. Describe how you carried out this experiment. Include a diagram of the experimental apparatus. **3**

END OF PAPER