

**SENIOR SCIENCE****YEAR 12 TRIAL****ANSWER SHEET****TERM III, 2007****TIME ALLOWED: 3 hours***PLUS 5 minutes reading time***General Instructions**

- Write your Student Number at the top of this page.
- Answer ALL multiple choice questions on this Answer Sheet.
- Use a pencil to fill in the circle indicating your answer.

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**PART A**

- Start here** →
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

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***PYMBLE LADIES' COLLEGE***  
**SENIOR SCIENCE**  
**2007**  
**TRIAL HSC EXAMINATION**

**General Instructions**

- Reading time – 5 minutes
- Working time – 3 hours
- Write using blue or black pen
- Draw diagrams using pencil
- Board-approved calculators may be used

**Total Marks – 100**

**Section 1 – 75 marks,**

This section has 2 parts, Part A and Part B

Part A – 15 marks Multiple Choice

- Attempt questions 1-15
- Allow about 30 minutes for this part

Part B – 60 marks

- Attempt questions 16 – 30
- Allow about 1 hour 45 minutes for this part

**Section 2 – 25 marks**

- Attempt ONE question – Question 31
- Allow about 45 minutes for this section.

**Section I (75 marks)****Part A – 15 marks**

Attempt Questions 1 -15

Allow about 30 minutes for this part.

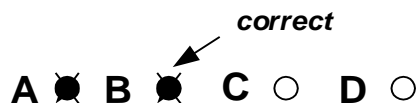
**Use the multiple choice Answer Sheet for ALL multiple choice answers.**

Select the alternative A, B, C or D that best answers the question. Fill in the response circle completely.

**Sample**      $2 + 4 =$  (A) 2   (B) 6   (C) 8   (D) 9A  B  C  D 

If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

A  B  C  D If you change your mind and have crossed out what you consider to be the correct answer, then indicate this by writing the word **correct** and drawing an arrow as follows:

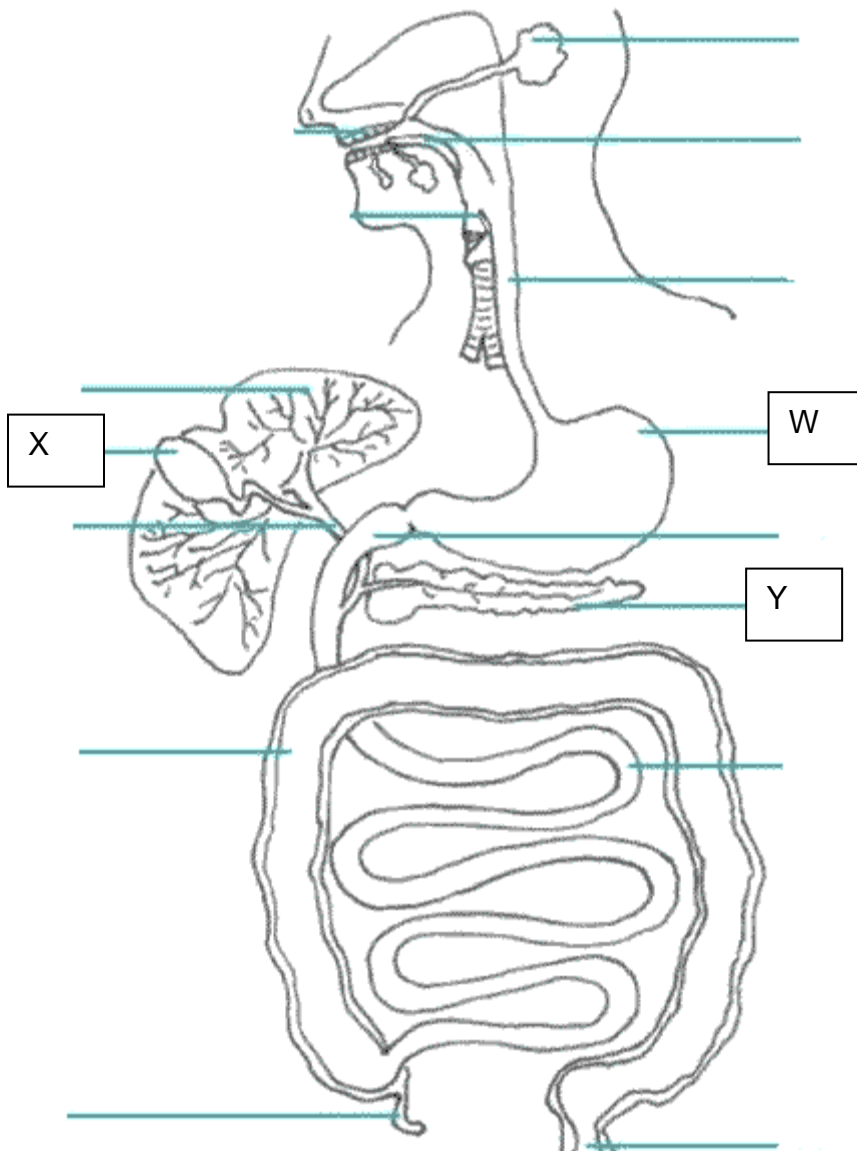
*correct*  

 A  B  C  D

- A colloid is a mixture that –
  - contains solids that settle out over time.
  - a beam of light cannot be seen through.
  - leaves no residue when filtered.
  - contains particles that are dispersed in a liquid.
- Salad dressing made with half a cup of oil, a quarter of a cup of lemon juice and a teaspoon of sugar is a colloid. Which of the following colloid types best describes this colloid?
  - oil – in – water colloid
  - liquid – in – liquid colloid
  - water – in – oil colloid
  - gas – in – liquid colloid

3. Which of the following best describes a solvent?

- (A) the liquid a solute dissolves in.
- (B) the substance formed from a solute and a liquid.
- (C) the substance produced when a solute dissolves in a liquid.
- (D) the chemical which dissolves in the liquid.

4. Identify the parts of the digestive system labelled with the letters W, X and Y respectively.



- (A) oesophagus, stomach, small intestine
- (B) stomach, gall bladder, pancreas
- (C) liver, stomach, large intestine
- (D) stomach, pancreas, liver

5. The method used for drug administration depends on:

- The speed of relief required
- The target cells and the ease of access
- The solubility of the drug
- Ease of administration

A person suffering an acute asthma attack is given a cortisone injection. Which of the four factors above is most important in deciding the method of drug administration in this case?

- (A) the speed of relief required.
- (B) the target cells and the ease of access.
- (C) the solubility of the drug
- (D) ease of administration

6. Biomaterials can be used to replace damaged or diseased human body parts. Crowns and dentures are used to replace –

- (A) lost or damaged hands
- (B) damaged valves in the chambers of the heart
- (C) damaged teeth
- (D) damaged joints in humans

7. The part of the respiratory system which is commonly called the windpipe and has tough rings of cartilage keeping it open is the –

- (A) Trachea
- (B) Bronchi
- (C) Alveoli
- (D) Bronchioles

8. Which of the following operations may require the use of a heart-lung machine?

- (A) Knee reconstruction
- (B) Angioplasty
- (C) Open-heart surgery
- (D) Hip replacement

9. If you listen to your heart with a stethoscope, you will hear two distinct sounds, often called the 'lub' and the 'dup'. These noises are a result of the valves of the heart closing. Which of the following correctly matches the noise with its valves?

(A) The 'lub' is the closing of the bicuspid and tricuspid valves and the 'dup' is the closing of the semilunar valves.

(B) The 'lub' is the closing of the semilunar valves and the 'dup' is the closing of the bicuspid and tricuspid valves.

(C) The 'lub' is the closing of the semilunar valve between the ventricle and pulmonary artery and the 'dup' is the closing of the valve between the ventricle and the aorta.

(D) The 'lub' is the closing of the semilunar valve between the ventricle and the aorta and the 'dup' is the closing of the valve between the ventricle and the pulmonary artery.

10. When the sounds in a stethoscope are abnormal there may be something wrong with the heart. If the flow of blood through the heart is disturbed by obstructions or a vibration of the muscle wall it is called –

(A) Ischaemia

(B) Tachycardia

(C) Bradycardia

(D) Heart murmur

11. For successful communication to occur a basic pattern needs to be followed. The correct pattern is –

(A) Code common to both parties – Message – Decoder

(B) Code common to both parties – Message – Transmission of coded message - Decoder

(C) Message – Transmission of coded message – Decoder

(D) Code common to both parties – Transmission of coded message – Decoder

12. The road sign below is an example of –



- (A) Verbal communication
- (B) Non-verbal communication
- (C) Verbal and non-verbal communication
- (D) Neither verbal nor non-verbal communication

13. Identify the communication system where sound energy is converted into electrical energy into light energy into electrical energy and back into sound energy.

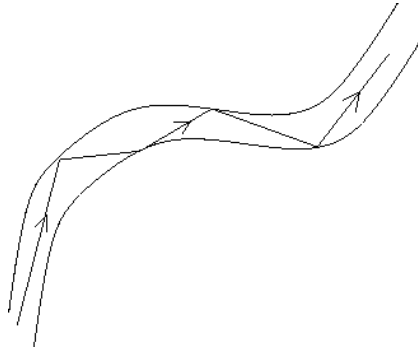
- (A) Radio
- (B) Television
- (C) Telephone
- (D) Fax machine

14. Different satellites have a different 'footprint'. "Footprint" can be defined as –

- (A) The area on the surface of the Earth where a signal transmitted from a satellite can be received.
- (B) The area on the surface of the Earth that the satellite is located above.
- (C) The ground station which transmits signals to a geostationary satellite.
- (D) The piece of equipment which receives weak signals from the Earth and amplifies it.



15. A property of light that is useful in optical fibre technology is shown below.



This property is called -

- (A) Reflection
- (B) Refraction
- (C) Scattering and absorption
- (D) Total internal reflection

**Section I continued.**

**Part B** – 60 marks

Attempt Questions 16 – 30.

Allow about 1 hour and 45 minutes for this part.

16. Explain why water drops are spherical in shape. **2**

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17. Define biodegradable and discuss the importance of soaps and detergents being biodegradable. **3**

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18. a) What is meant by pH? **1**

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b) A cosmetic Scientist does an analysis on a fresh batch of face cream they are making and discovers that the pH is too low and wants to bring it back to neutral. Describe a method that could be carried out to achieve this. **2**

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c) Describe another factor, other than face cream, that could help to maintain the natural pH of the skin. **2**

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19. During your study of Lifestyle Chemistry you carried out a first hand investigation to test the manufacturers claim on a commercial product such as soap, shampoo or shower gel.

a) Describe the investigation you carried out. **5**

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b) Assess the validity of the manufacturers claim based on your results. **2**

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20. a) Name one type of cosmetic or external medication that uses water as the solvent. **1**

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b) Explain why water was chosen as the solvent for the product named in a). **2**

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21. Identify **two** types of material used to make pacemakers and outline the properties that make these materials suitable for implanting in the body. **3**

Material - \_\_\_\_\_

Properties - \_\_\_\_\_

\_\_\_\_\_

Material - \_\_\_\_\_

Properties - \_\_\_\_\_

\_\_\_\_\_

22. Atherosclerosis is the thickening of artery walls due to the build-up of fatty deposits called plaque. This may eventually block the flow of blood through the artery. If this happens in the coronary arteries a heart attack may occur.

Discuss **two** techniques used to ease blood flow to and from the heart if atherosclerosis has occurred. **4**

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23. Account for the use of cardiac compressions during artificial respiration. **2**

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24. Identify a life support device used in hospitals and explain its role in maintaining life. **3**

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25. Describe the problems that can result from faulty valves in the heart. **3**

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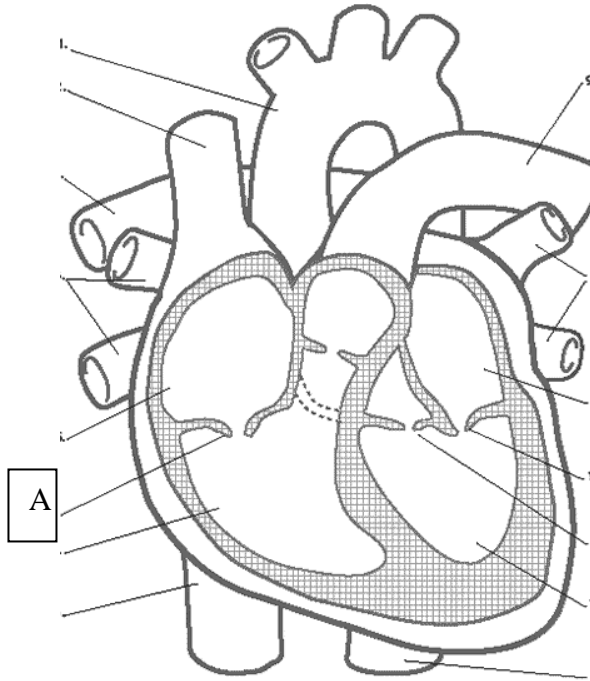
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26. a) Label part A on the diagram of the heart below.

**1**



b) Describe the function of part A.

**2**

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c) Rhythmic contractions of your heart muscle make your heart beat. Describe how this happens.

**2**

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27. During your study of Information Systems, you developed a timeline of communication systems introduced to society like the one below.

1837 – The telegraph was developed by Samuel Morse.

1876 – Alexander Graham Bell made his first successful telephone call

1898 – Guglielmo Marconi sent the first radio message

1924 – Radar was invented by the British

1956 – First Australian television show was broadcast

1962 – First public communications satellite was launched

1970's and 1980's – Optical fibres were developed and refined

1983 – First mobile phones developed

a) Select three of these systems, identify the type of energy or electromagnetic wave which they use and analyse the impact they each had on society. **7**

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28. Compare the advantages and disadvantages of using microwaves and radio waves in communication technologies. **4**

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29. a) Outline properties of optical fibres that allow them to be used as communication carriers. **2**

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b) Contrast copper cables with fibre-optic cables in relation to security and explain the differences. **4**

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30. a) Identify a satellite used for 'live' telecasts from other regions of the world to or from Australia. **1**

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b) Explain why the Earth-based satellite dish must face a fixed direction if it remains in the same location with respect to the geostationary satellite. **2**

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**Section II (25 marks)**

Attempt one option.

Allow about 45 minutes for this part.

**Answer the questions in this section ON THE WRITING PAPER PROVIDED.**

**Question 31 - PHARMACEUTICALS (25 marks)**

- a) State the components of the central nervous system. **1**
- b) Distinguish between muscles and glands. **2**
- c) Describe the role of sense organs to our detection of signals and state two examples of sense organs. **4**
- d) Draw up a table to distinguish the structure, function and blood carrying capacity of veins, arteries and capillaries. **7**
- e) Discuss the administration of a “pain killer” and explain the process it goes through to kill the pain. **3**
- f) i) Name three main types of bacterial cells you have studied and draw a diagram of each one. **3**
- ii) Explain how penicillin affects bacterial cells. **2**
- iii) Some bacteria have resistance to penicillin. As a result of this, evaluate the possible implications this will have for future use of penicillin. **3**