03

| Centre Number | Candidate Number |
|---|---|
| | |

**MINISTRY OF EDUCATION AND HUMAN RESOURCE DEVELOPMENT**

# SOLOMON ISLANDS SCHOOL CERTIFICATE

# 2019

# SCIENCE

**FRIDAY 8TH NOVEMBER 9.00AM TIME: 3 Hours Plus 10 Minutes Reading Time.**

| SECTION | CONTENT | MARKS | TIME |
|---|---|---|---|
| A | MULTIPLE CHOICE | 20 | 30 mins |
| B | SHORT ANSWER QUESTIONS | 35 | 60 mins |
| C | LONG ANSWER QUESTIONS | 45 | 90 mins |
| | **TOTAL** | **100** | **180 mins** |

## INSTRUCTION TO CANDIDATES

1. Do NOT open this booklet until you are told to do so.
2. Write your **Centre Number** and **Candidate Number** at the top right hand corner of this page and also on the back-flap at the back of this booklet.
3. There are THREE (3) Sections in this paper.
4. All Sections are Compulsory.
5. Write your answers to **Section A** on the on the back-flap on the last page. And your answers to **Sections B** and **C** in the spaces provided in this booklet.
6. Do NOT use correction fluid.
7. Mobile phones are NOT allowed in the Examination room.

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

**THIS BOOKLET CONTAINS 21 NUMBERED PAGES.**

## SECTION A: MULTIPLE CHOICE QUESTIONS (20 MARKS)

**WRITE THE LETTER OF THE MOST CORRECT ANSWER IN THE BACK-FLAP AT THE BACK OF THIS BOOKLET.**

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**1.** According to Newton and Galileo the two great physicians, the force that slows down moving object is the force of;

A. gravity
B. friction
C. work
D. motion

**2.** An outboard motor experiences a lot of different forces in its journey. All these forces act in different directions. The force that determines the direction of the outboard motor is called;

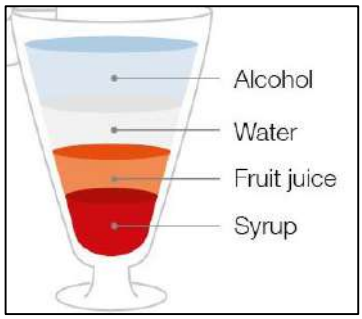
A. pulling force.
B. pushing force.
C. resultant force.
D. resistance force.

**3.** 1000 kilo joules of energy was used by a car to travel at a speed of 20m/s. The driver wants to go faster at the speed of **40m/s**.

The total amount of energy needed to drive the car at the speed of 40m/s is;

A. 1000 kilo joules.
B. 2000 kilo joules.
C. 3000 kilo joules.
D. 4000 kilo joules.

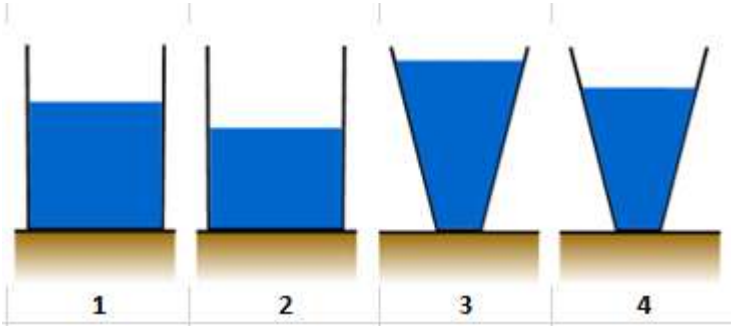
**The diagram below shows 4 different liquids placed in a glass cup.**




**4.** From the above, which liquid has the **highest** density?

A. Water
B. Syrup
C. Alcohol
D. Fruit juice

**The diagram below shows equal volume of water inside 4 different size beakers labelled (1-4).**

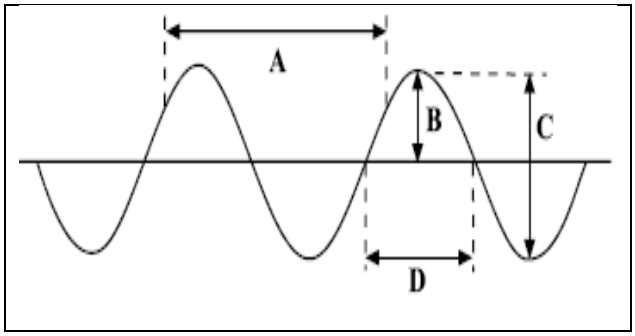



**Use the above diagram to answer question 5.**

**5.** Which of the beakers exert the largest pressure onto the bottom of the beaker?

A. 1
B. 2
C. 3
D. 4

**The diagram shows a sketch of a sound wave.**




**6.** From the above diagram, the part **labelled A** is called;

A. trough.
B. amplitude.
C. frequency.
D. wavelength.

**7.** A girl sings with a very high pitch, during a singing competition. High pitch produces;

A. large wavelength.
B. small wavelength.
C. low frequencies.
D. high amplitude.

**An element X was discovered in Mars and has the following properties, 7 electrons 8 neutrons and 7 protons.**

**Use the information in the box above to answer questions 8, 9 and 10**

**8.** Which **Period** and **Group Number** does element **X** belong to in the Periodic Table?

A. I and II
B. I and III
C. II and V
D. III and IV

**9.** The correct **charge** for element X is;

A. +2
B. -2
C. +3
D. -3

**10.** The correct **atomic number** for element X is,

A. 7
B. 8
C. 14
D. 15

**11.** Lemon fruit juice is being tested for its acidity and basicity and found to be very acidic. Thus, the CORRECT **pH** for the lemon juice is;

A. 2
B. 7
C. 8
D. 14

**12.** An **alloy** is made up of;

A. Tin.
B. Silver.
C. Gold.
D. Silver and Gold.

**13.** The **allotropes** of carbon are;

A. Brass and Steel.
B. Bronze and Brass.
C. Graphite and Diamond.
D. Charcoal and Cast Iron.

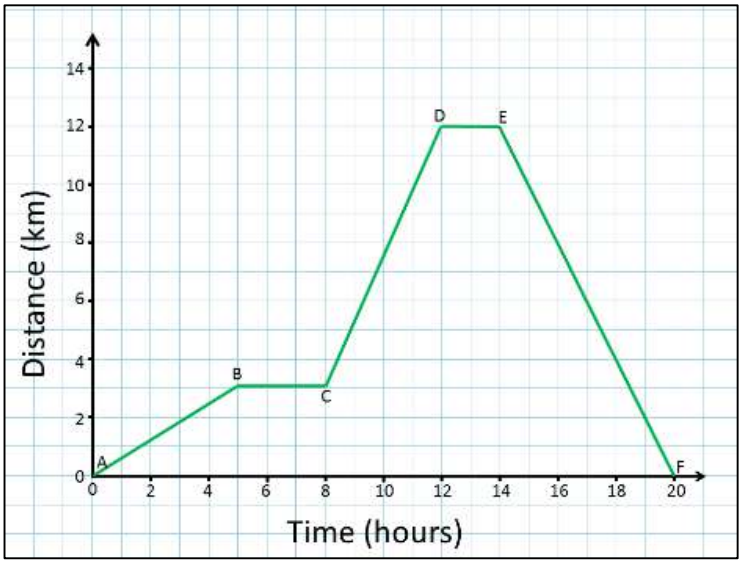
**14.** A gene that codes for red color of the hibiscus flower has the following strand, **AATGCCTGG**. Thus its **corresponding strand** of the double helix structure is;

A. TTGCGGACG.
B. UUGCGGACC.
C. TTACGGACC.
D. AATGCCTGG.

**15.** Part of plant that **meiosis** is likely to occur is in the;

A. stem
B. leaves
C. root tips
D. flowers

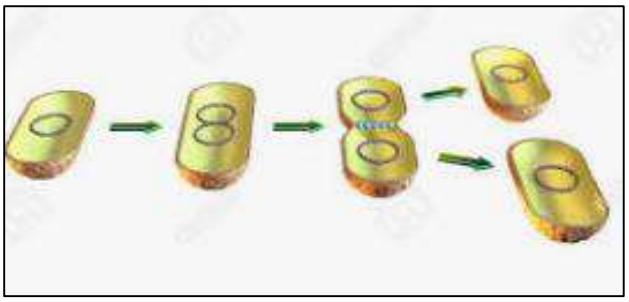
**The graph below shows a distance-time graph of car traveling for 20 hours.**




**16.** From the above graph, what happened to the car at **point B-C**?

A. Stops
B. Speeding steadily
C. Travels at constant speed
D Travels at constant acceleration

**17.** The diagram below shows a **bacterium** dividing into 2 bacteria of the same size. This kind of division is known as;

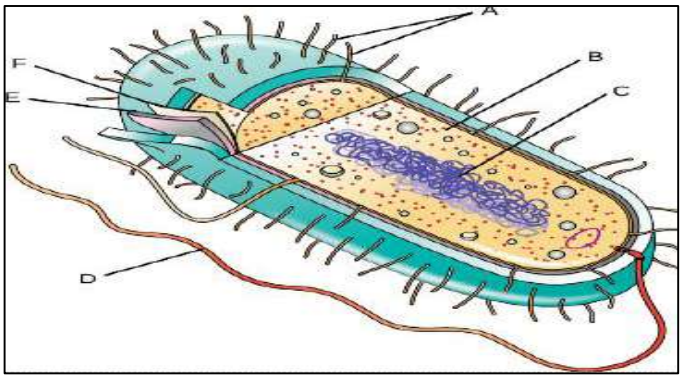


A. regeneration.
B. binary fission.
C. sexual reproduction.
D. vegetative reproduction.

**18.** The conditions that allow **photosynthesis** to take place are;

A. Sunlight, Oxygen, Chlorophyll and Water.
B. Glucose, Water, Chlorophyll and Sunlight.
C. Water, Chlorophyll, Carbon dioxide and Sunlight.
D. Nitrogen gas, Chlorophyll, Water and Sunlight.

**The diagram below shows a bacterium seen under microscope at X1000.**




**19.** From the above diagram, the function of part **labelled D** is;

A. use for feeding.
B. to sense other organisms.
C. to anchor bacterium to the host.
D. to move the bacterium around.

**20.** One of the factors that cause the **increase** in the population of Solomon Islands is;

A. cash flow.
B. malnutrition.
C. high birth rate.
D. high death rate.

| **Section A.** | |
|---|---|
| | **20** |

## SECTION B: SHORT ANSWER QUESTIONS (35 MARKS)

**WRITE YOUR ANSWERS IN THE SPACES PROVIDED. IF YOU NEED MORE SPACE FOR ANY ANSWER, ASK YOUR INVIGILATOR FOR EXTRA SHEET OF PAPER. MAKE SURE TO WRITE YOUR NAME AND QUESTION NUMBER ON THE EXTRA SHEET.**

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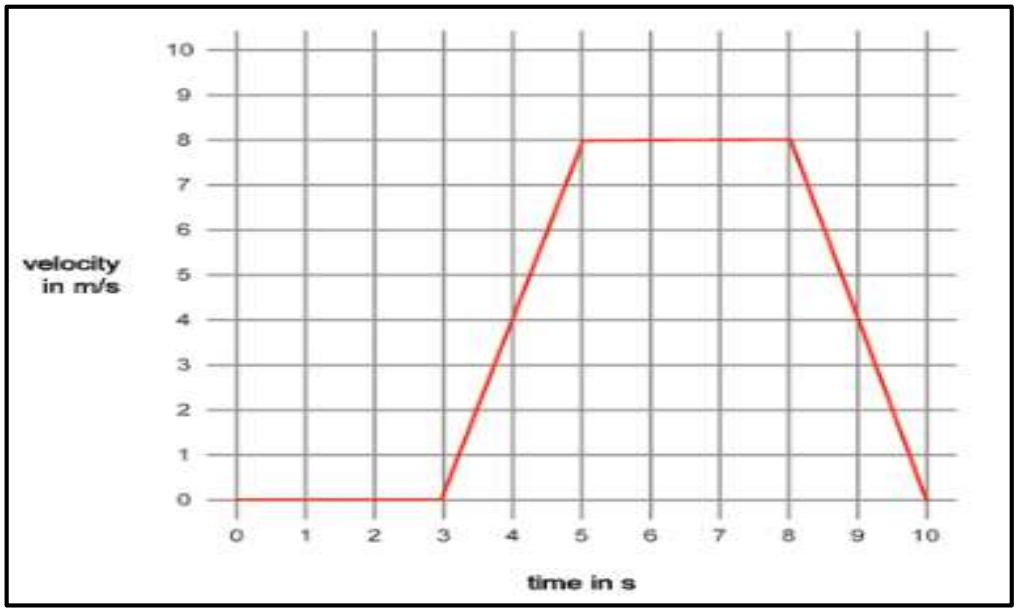
**21.** The graph below shows speed time graph of a car traveling for 10 secs.




**Study the above graph and answer questions (i – iii) that follow.**

i. What is the **velocity** of the car at 4 seconds?

_____

(1 mark)

ii. What is happening to the car at;

A. 5 to 8 seconds.

_____

(1 mark)

B. 8 to 10 seconds

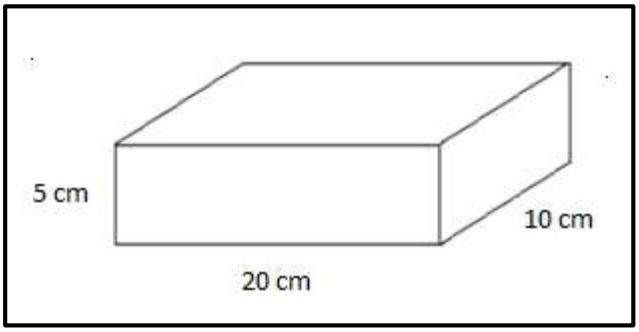
_____

(1 mark)

iii. Calculate the **total distance** the car has travelled.

(2 marks)

**22.** (A) A block of iron has the following measurements.




The iron cube above has a mass of 5kgs. Calculate the **density** of the cube.

(3 marks)

(B) Describe **refraction** when it travels through more to less dense medium.

_____

_____

_____

(2 marks)

**23.** Below is a section of the periodic table showing element W, X, Y and Z in their respective period and group numbers as indicated by the arrows.

| **Period →** <br> **Group 1 ↓** | **i** | **ii** | **vii** | **viii** |
|---|---|---|---|---|
| i | **W** | | | |
| ii | | **X** | | |
| iii | | | **Y** | |
| iv | | | | **Z** |

**Study the above table and answer questions (i – iv) using the letter W, X, Y and Z.**

i. Name the MOST stable element.

_____

(1 mark)

ii. Write the **chemical formula of XY** when element X combines with element Y.

_____

(1 mark)

iii. Explain the **type of bond** formed for compound XY in *question 23 (ii).*

_____

_____

_____

_____

(2 marks)

iv. Suggest the number of shells for **element W**.

_____

(1 mark)

**24**. Steel an alloy of iron and carbon atom is **stronger** than its original elements.

i. Draw the **atomic structure** of iron metal and steel to show how this is possible.

| (a) **Iron metal structure** | (b) **Steel structure** |
|---|---|
| | |

(4 marks)

**25**. Most of the diseases humans encounter today are caused by either **virus or bacteria**.

i. Complete the table below to show what type of organism causes each disease.

| Disease | Organism |
|---|---|
| 1. Tuberculosis | |
| 2. Influenza | |

(2 marks)

ii. Explain what kind of drugs are **effective** to cure viral and bacterial infection.

(a) Viral:

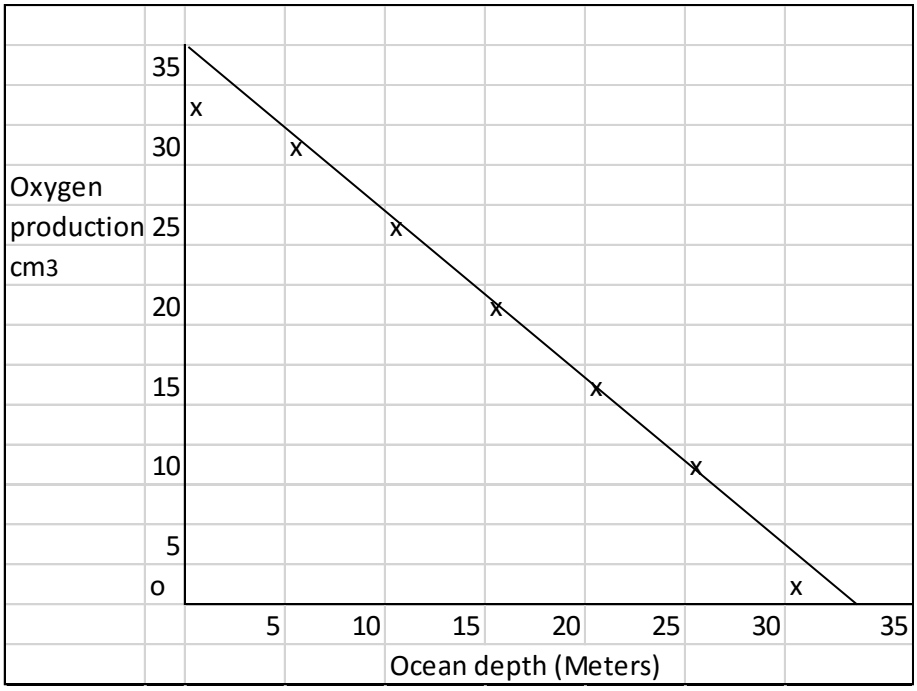
_____
_____
_____

(b) Bacterial:

_____
_____
_____

(2 marks)

**26**. Graph shows the rate of photosynthesis (oxygen production) with depth in the Ocean water.




**Study the graph above and answer questions (i and ii) that follow.**

i. Explain the trend of the above graph.

_____
_____
_____
_____
_____

(2 marks)

ii. State TWO (2) factors that may **increase** the rate of photosynthesis in the ocean.

a._____

b_____

(2 marks)

**27.** A marathon runner experiences muscle pain to the bicep muscles at the back of his legs.

i. Explain the condition that leads to muscle pain.

_____
_____
_____

(2 marks)

ii. Write a **chemical equation** to show the process that occurs in *question 27 (i)*

_____
_____
_____

(2 marks)

**28.** Homeostasis in organism is very important to ensure that balance is maintained in the body.

i. Explain how the **liver controls** the amount of glucose in the body when;

a. glucose level in the blood is **high**.

_____
_____
_____

(2 marks)

b. glucose level in the blood is **low**.

_____
_____
_____

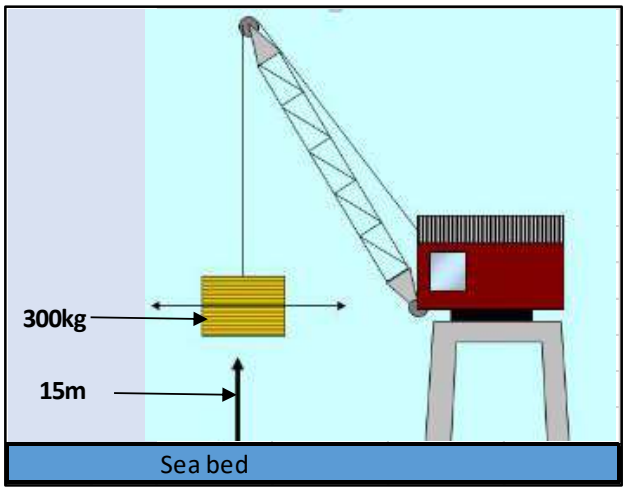
(2 marks)

| | |
|---|---|
| **Section B.** | |
| | **35** |

## SECTION C: LONG ANSWER QUESTIONS (45 MARKS)

**29.** The diagram below shows a crane lifting a box full of gold from the bottom of the sea bed.

**Study the diagram below and answer questions (i – iii) that follow.**




i. What is the amount of **work done** when the box of gold swing from side to side?

_____

(1 mark)

ii. **Justify** your answer in the above *question 29(i).*

_____

_____

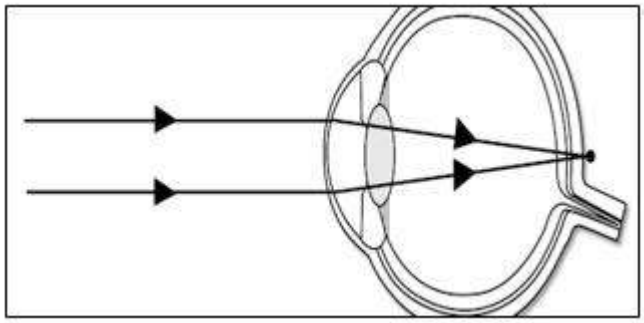
(1 mark)

iii. Calculate the **work done** in lifting the gold box 15 metres from the bottom of the sea bed.

(4 marks)

**30.** A diagram below shows eye ball of a short sighted person and two possible rays of light from an object.

**Study the diagram below and answer questions (i and ii) that follow.**



i. Explain the problem that a person has with his eyes when the focal point falls behind the retina as in the diagram above.

_____

_____

_____

(2 marks)

ii. In the box below **Sketch an eye ball with correct lens, focal point, and 2 light rays** to show how the above problem is corrected.

(6 marks)

**31.** The most common gas in the atmosphere that plants use to make their food is carbon dioxide. In the space below show how Carbon is bonded with Oxygen to form carbon dioxide.

**Use the information from the table of 'Element' provided to help you answer questions (a-d) that follow.**

| Element | Carbon atomic structure | Oxygen atomic structure |
|---|---|---|
| Draw the nucleus and the outer shell only with correct number of electrons  | **a.** (2 marks) | **b.** (2 marks) |
| Show how the two elements bonded together | **c**. (5 marks) | |
| Write the chemical formula | **d**. (1 mark) | |

(10 marks)

**32.** Asian fowls' body colour is determined by alleles, **neither of which is dominant**. The table below shows the results of crossing **pure black Asian fowl** with **pure Asian white fowl to produce F1 offspring.** The F1 offspring were allowed to cross to produce F2 generation

Use letter "B" to represent allele for black colour and letter "W" to represent alleles for white colour.

**i. Study the table below for the cross and write correct answers in the blank spaces (a – l) provided.**

| **Parental Generation** | Male | | Female |
|---|---|---|---|
| Phenotype | Pure Black | X | Pure White |
| Genotypes | a. | | b. |
| Possible Gametes | c. | | d. |
| | ⇩ | | |
| **F1 Generation** Phenotype | Grey | X | Grey |
| Genotype | e. | | f. |
| Gamete | g. | | h. |
| | ⇩ | | |
| **F2 Generation** | | | |
| Possible Phenotypes | i. | | j. |
| | k. | | l. |

(12 marks)

**33**. You are assigned by the tourism office to make an **environmental impact statement** on the proposed holiday resort to be built on an identified coastal area. The resort has the capacity to accommodate more than 100 guests and would also require clearing large areas of mangroves for building a marina harbor purposely for recreational activities.

Evaluate the environmental impact of the proposed development that would have on the environment at the project site. *(Provide answers in a list of bullet points. Spaces are provided on pages 19-20).*

(9 marks)

| Section C. | |
|---|---|
| | 45 |

# SISC – SCIENCE 2019

| CENTRE NUMBER | | | CANDIDATE NUMBER | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

## SECTION A
## MULTIPLE CHOICE (20 MARKS)

Write the letter of the correct answer in the box provided. Make sure your answer is put alongside the right question number.

**Example:** If you consider A is the correct answer, write it like this: A

To change your answer from A to C, Cross out A and write the new answer **C** by the box, like this: ~~A~~ C

| | | | |
|---|---|---|---|
| **1** | | **11** | |
| **2** | | **12** | |
| **3** | | **13** | |
| **4** | | **14** | |
| **5** | | **15** | |
| **6** | | **16** | |
| **7** | | **17** | |
| **8** | | **18** | |
| **9** | | **19** | |
| **10** | | **20** | |

## FOR MARKERS USE ONLY

| SECTION | MARK | MARKER | CHECKER |
|---|---|---|---|
| **A** | **20** | | |
| **B** | **35** | | |
| **C** | **45** | | |
| **TOTAL** | **100** | | |
| **Marker/ Checker Initials** | | | |