Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2019

Technology

Higher Level

Monday, 24 June
Afternoon, 2:00 - 4:30

There are **three** Sections in this paper. Attempt **all three** Sections.

Section A: Core - Short-answer questions.

Section B: Core - Long-answer questions.

Section C: Options - Long-answer questions.

Section A - Core *(72 marks)*

Instructions:

(a) *Answer **any twelve** questions in the spaces provided. All questions in Section A carry 6 marks.*

(b) *Draw all sketches in pencil.*

(c) *Hand up this booklet at the end of the examination.*

(d) *Write your examination number in the box provided and on all other pages used.*

Centre Number

Section	Mark
Section A	
Section B	
Section C	
Total	
Grade	

***Examination Number*:**

Section A. *Answer **any twelve** questions. All questions carry 6 marks.*

1. Technological development has revolutionised the ways in which products are developed. Give **one** example for **each** heading below illustrating the impact of technology on the development of a mass-market drone.

(i) Research _____

(ii) Prototyping _____

(iii) Manufacture _____

2. The USB-C (or USB Type C) connector is increasingly seen on a range of devices, such as the laptop shown.
Outline **two** advantages of USB-C over other USB connectors.

(i) _____

_____

(ii) _____

_____

3. In the context of information security, *social engineering* refers to the manipulation of people to divulge personal and confidential information using techniques such as phishing or vishing.

(i) What is phishing?

_____

_____

(ii) Outline **one** method of guarding against social engineering.

_____

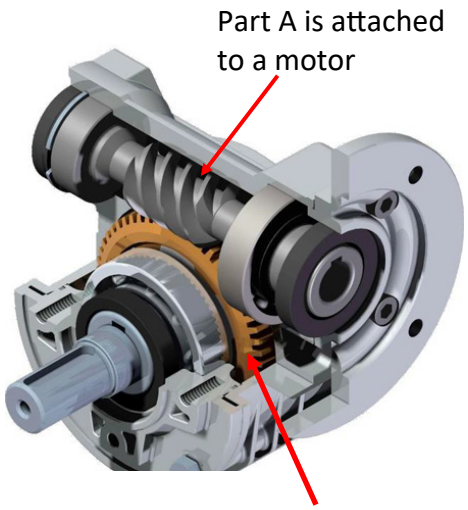
_____

4. (i) Name the mechanism shown in the graphic.

_____

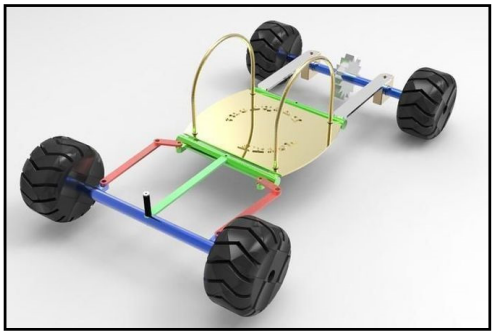
(ii) If the motor rotates at 300 RPM, determine the time taken for Gear **B** to complete one full revolution.

Calculation:



5. Compile a simple Work Breakdown Structure (WBS) for the manufacture, in a school workshop, of the buggy shown.

WBS:



6. (i) Describe the operation of the electronic component shown.

_____

_____

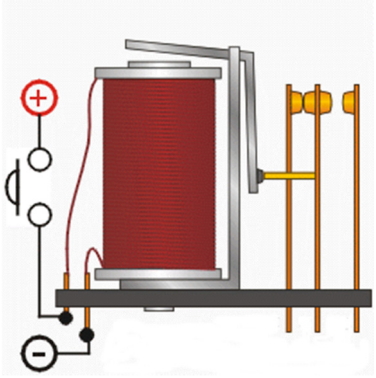
_____

(ii) Explain the abbreviations associated with this device.

NC _____

NO _____

COM _____

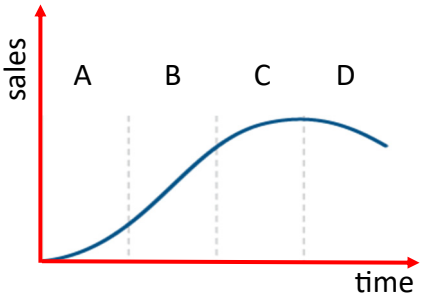


7. New products exhibit recognised phases following the launch and introduction phase (A). Name **each** of the phases B, C and D of the lifecycle graph shown.

B _____

C _____

D _____



8. The design and finish of the exercise machine shown is of high quality. The manufacturer also requires that the machine operates quietly.

Describe, using annotated sketches, how the pedals and their connecting shaft can be designed to operate with a minimum of noise.

9. Mamukko is a Kinsale based company that creates bags from selected reclaimed sails, liferafts, leather and other textiles. Each Mamukko bag is handcrafted in their workshop.

(i) Outline briefly the process of upcycling.

_____

_____

(ii) State the impact upcycling has on cost of materials **and** on processing a handcrafted bag.

_____

_____

_____

10. Sonarc, an Irish company, has created the world's first audio speaker which has no moving parts.

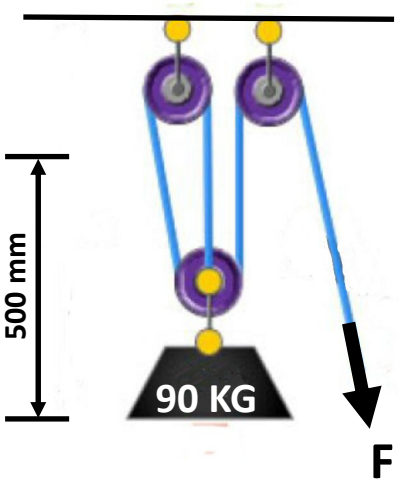
(i) State **one** energy conversion that takes place in an audio speaker.

(ii) Outline **two** advantages of designing an audio speaker with no moving parts.

11. The pulley system shown is used to assist in raising heavy loads.

(i) Calculate the work done to raise the 90 kg weight through 500 mm by applying a force at **F**.
Assume g = 9.81 m/s^2

Calculation:



(ii) Explain the term *mechanical advantage*.

12. Using an appropriate example, describe briefly how a product might be tested against a design specification.

Selected product: _____

Testing procedure: _____

_____

_____

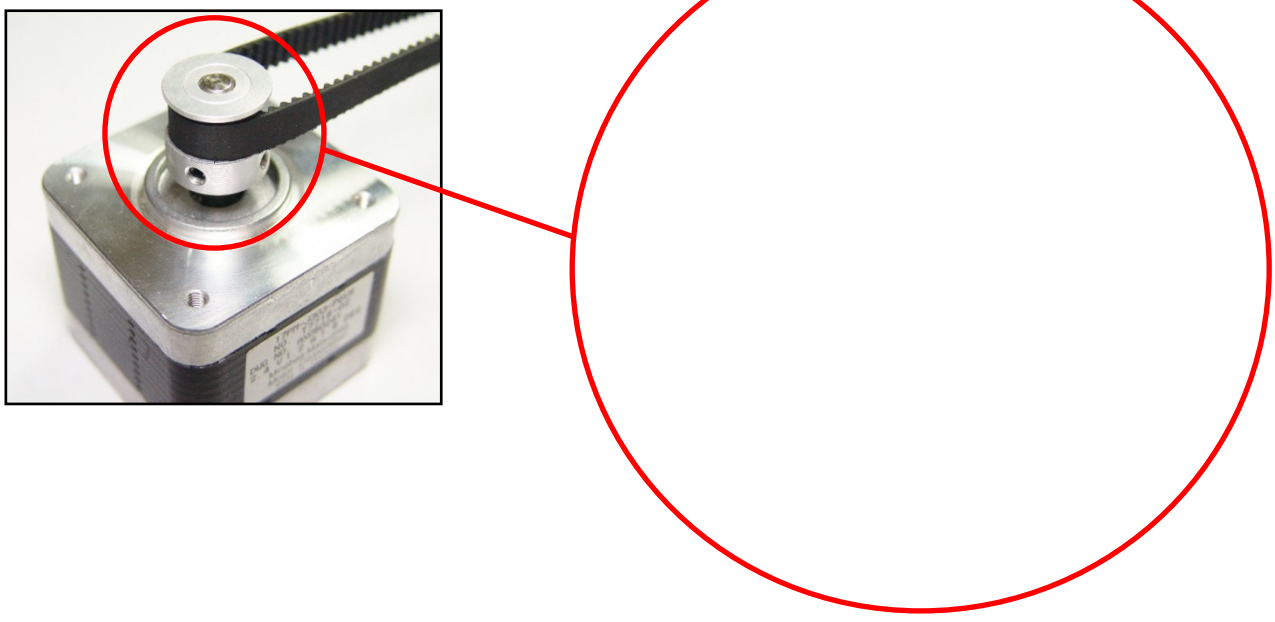
_____

_____

_____

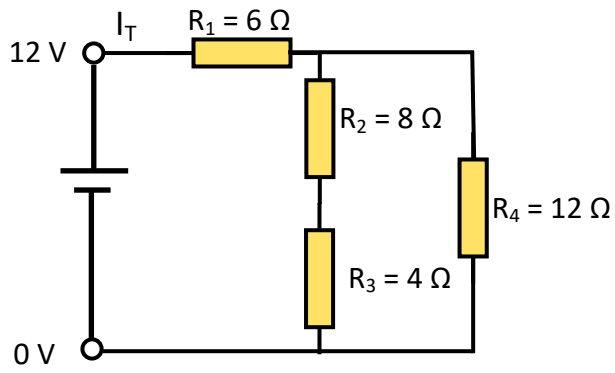
13. The pulley-wheel shown is driven by the motor.

Make a sketch showing how the pulley-wheel could be located on the motor shaft to prevent slippage.



Annotated sketch of detail to prevent slippage

14. (i) Calculate the total resistance of the circuit shown.

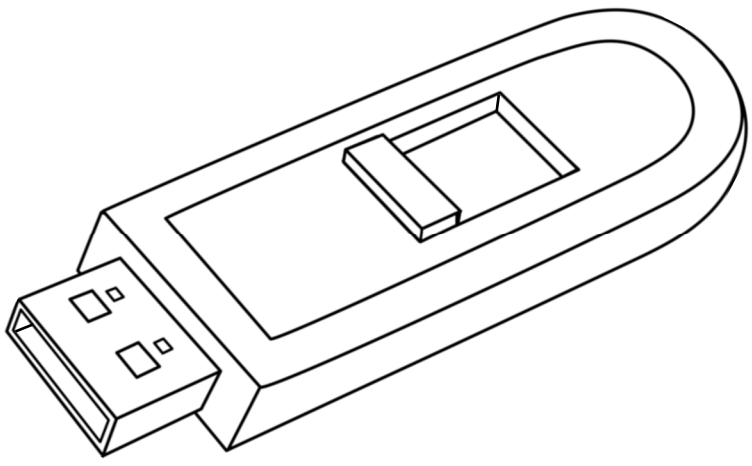


Calculation:

(ii) Calculate the current (I_T) drawn from the 12 V supply.

Calculation:

15. Use **two** graphic techniques to enhance the representation of the device shown.



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