Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2017

Technology

Higher Level

Friday, 23 June
Morning, 9:30 - 12:00

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.*

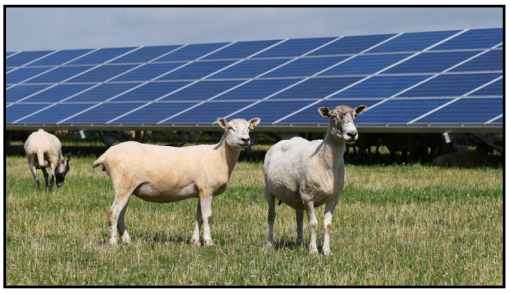
Centre Number

Section	Mark
Section A	
Section B	
Section C	
Total	
Grade	

***Examination Number*:**

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

1. The first large-scale ground based solar electricity generation park on the island of Ireland has opened in Co. Antrim. The 12 hectare solar farm at Crookedstone Road, which cost €6.45 million to build, produces up to 5 MW of power from 20,000 photovoltaic panels.



(i) Outline **one** advantage of solar electricity generation.

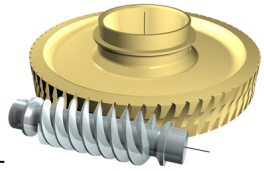
_____

(ii) Explain the meaning of the abbreviation 'MW'.

_____

2. The mechanism shown could be used in a car showroom turntable.

(i) Name the mechanism shown.



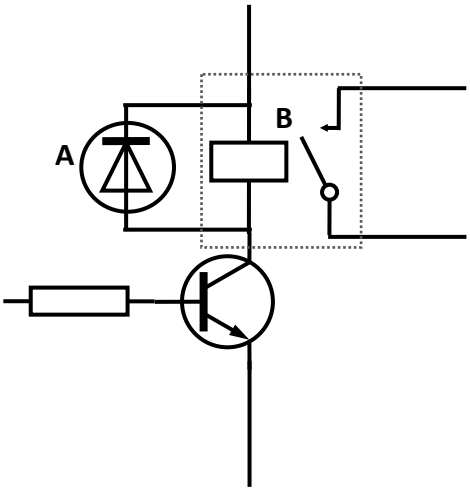
_____

(ii) Outline **one** advantage of using this mechanism.

_____

_____

3. Name and explain the functions of the electronic components **A** and **B** in the partial circuit shown.



(i) Component A

Name: _____

Function: _____

_____

(ii) Component B

Name: _____

Function: _____

_____

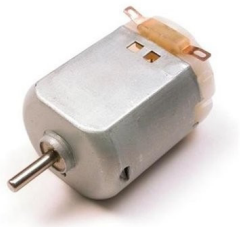
4. (i) Outline **two** essential functions of a laptop power supply unit.

1. _____

2. _____

(ii) A DC motor consumes 2 Watts of power and delivers 1.4 Watts of power at the output shaft. Calculate the efficiency of the motor.

Calculation:



5. A *torque wrench* is used to tighten the wheel bolts on a car.

(i) Explain the term *torque*: _____

(ii) If the length of the wrench is 500 mm and the required torque setting for the wheel bolt is 94 Nm, calculate the force required to achieve this torque.

Torque wrench

Calculation:

6. DOWN2EARTH materials are an Irish company specialising in sustainable food service packaging. Working alongside VEGWARE, they supply Ireland's largest range of certified compostable products and packaging to a wide variety of businesses in the food, catering, and event sectors.

(i) Give **one** example of a compostable consumer product.

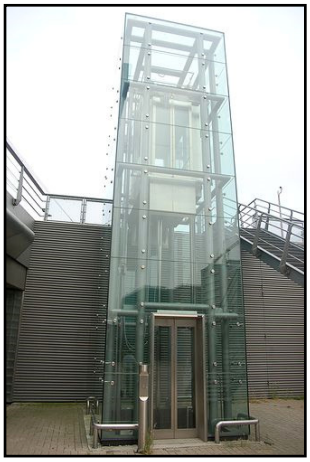
_____

(ii) Outline **two** advantages of using compostable products.

_____

_____

7. The up and down movement of a lift is powered by an electric motor. The lift carriage has a mass of 900 kg. Calculate the work done and the power required as the carriage moves 12 m from the ground floor to the top floor in 25 seconds.



Calculation:

8. Outline the meaning of **any three** of the safety signs labelled A,B,C and D.

(i) _____

_____

(ii) _____

_____

(iii) _____

_____

A

B

C

D

9. (i) Explain what is meant by a *Wifi hotspot.*

_____

_____

(ii) Explain why browsing the internet at a public hotspot in a coffee shop might be slower than browsing on a home network.

_____

_____

_____

10. Motor vehicle manufacturers are replacing steel components with plastic and composite materials in the construction of their cars.

Outline the impact on the environment of **each** of the following materials used in car production, when disposed of at the end of their useful life.

Steel:

_____

_____

Thermoplastics:

_____

_____

Fibreglass composite:

_____

_____

11. The resistor colour code tables are shown.

(i) State the value of the resistor R shown.

Value: _____

Colour band sequence is orange, white, yellow and silver.

(ii) Calculate the lowest and highest possible values for the resistor R:

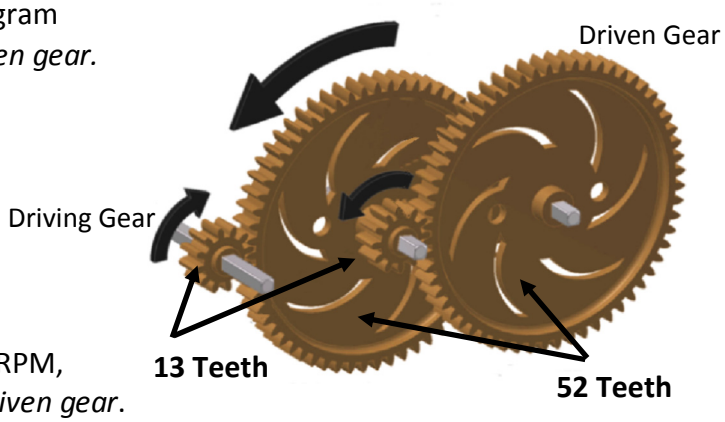
Lowest: _____

Highest: _____

Colour code	
0	Black
1	Brown
2	Red
3	Orange
4	Yellow
5	Green
6	Blue
7	Violet
8	Grey
9	white

Tolerance code	
1%	Brown
2%	Red
5%	Gold
10%	Silver

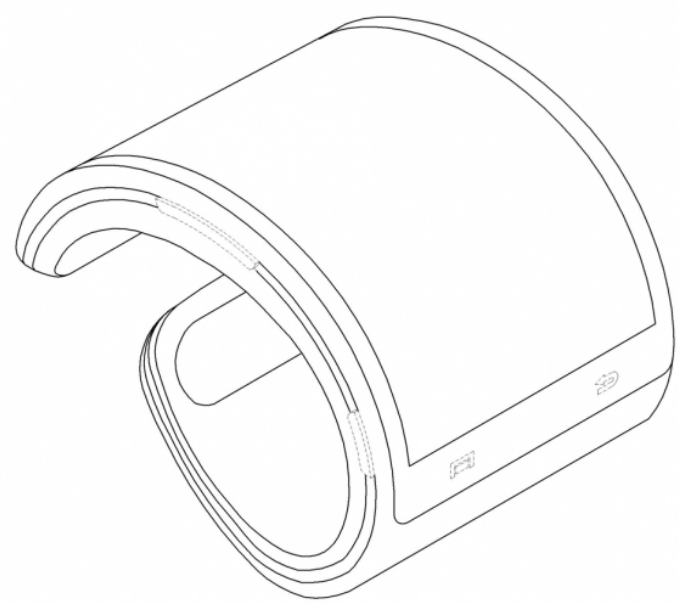
12. (i) Using an arrow, indicate on the diagram the direction of rotation of the *driven gear.*



(ii) If the *driving gear* is rotating at 500 RPM, calculate the output speed of the *driven gear*.

Calculation:

13. Use **two** graphic techniques to enhance the representation of the smartwatch shown.



14. CAM systems and robotic machines use CNC to provide commands for the machine to move in a particular direction at a given speed.

(i) Explain the terms:

CAM: _____

CNC: _____

(ii) Give **two** reasons for the use of *pick and place* robotic machines in high-volume production.

1. _____

_____

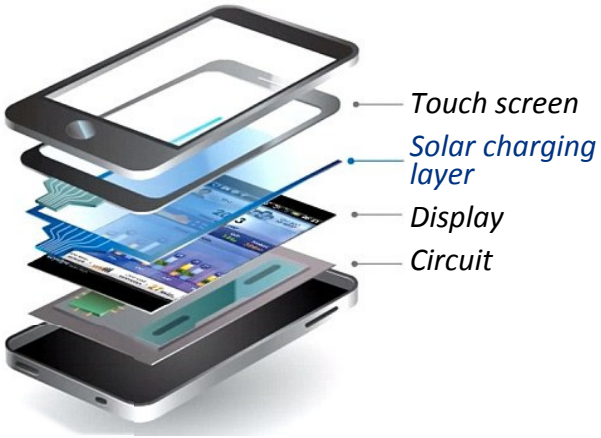
_____

2. _____

_____

_____

15. The graphic below highlights an innovative layer with solar charging properties in a prototype mobile phone. Sketch the **assembled** phone.



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