Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2015

Technology

Higher Level

Friday, 19 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. *Fairtrade®* is an organised social movement with the stated goals of helping producers in developing countries to achieve better trading conditions and to promote *sustainability*.

   (i)   Outline what is meant by sustainability.

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_____

   (ii)   Discuss why sales of Fairtrade® products have increased.

_____

_____

2. A client requires a computer workstation to be designed.

   (i)   Suggest **two** aspects of the computer workstation that a design engineer would need to research when developing their design.

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   (ii)   In **each** case explain why it is necessary to carry out this research.

_____

_____

3. On the 12th March 2014, the 25th anniversary of the World Wide Web was celebrated. The worldwide web has revolutionised the way we work, travel and communicate.

Explain the meaning of the following terms:

URL _____

_____

.html _____

_____

4. *Materials handling* is the process of moving material from one place to another during the manufacturing process.

Outline **one** advantage and **one** disadvantage of using robotic arms for materials handling.

Advantage:

_____

_____

Disadvantage:

_____

_____

5. State the meaning of each of the safety signs shown below:

(i) _____   (ii) _____   (iii) _____

_____   _____   _____

6. A leading retailer of home products sells items in *flatpack* form.

(i) Explain the meaning of the term flatpack.

_____

(ii) Outline **two** advantages of flatpack products for a furniture retailer.

_____

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_____

7. Electronic circuits require the flow of electrical current for their operation.

(i) What is meant by a conductive material?

_____

_____

(ii) Name a material that can exhibit both insulating and conducting properties.

_____

8. (i) A study lamp is connected to a 12 volt power supply and is drawing a current of 3 amps. Calculate the power of the lamp.
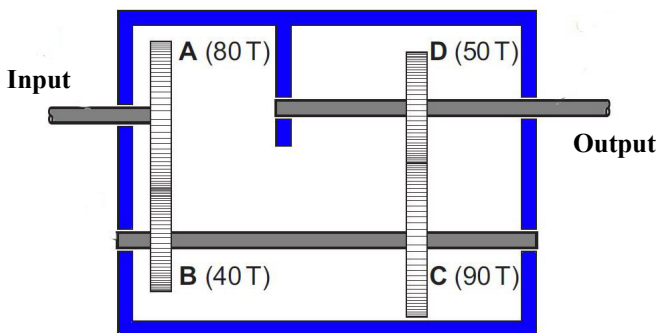
Calculation:

(ii) An electrical heating element having a resistance of 24Ω is connected to a 240V supply for a period of 12 hours. Calculate the cost of the energy used if electrical energy costs 25 cents per kWh.

Calculation:

9. Shown is the internal layout of a gearbox. The number of teeth on each of the four gearwheels is also shown. If the input shaft speed is 800 rpm calculate the output shaft speed.

Input

A (80 T)   **D (50 T)**

Output

B (40 T)   **C (90 T)**

Calculation:

10. *PhoneSoap®* is a device that bathes a mobile phone in ultraviolet rays. It was developed by Dan Barnes and Wesley LaPorte of Brigham Young University, Utah, USA.

    (i)   Why might you place your phone in ultraviolet light?

_____

_____

_____

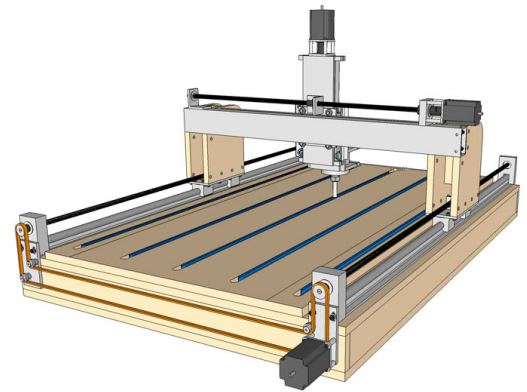   (ii)   Suggest **one** other appliance that uses ultraviolet light.

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11. A CNC router is an example of one element of a CAD/CAM system.

    (i)   Explain the terms:

        CNC _____

        CAM _____

    (ii)   Describe **two** advantages of using CNC machines in a manufacturing workshop.

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_____

12. Shown is a pulley system on a pillar drill. This mechanism is used to change the speed of the drill.

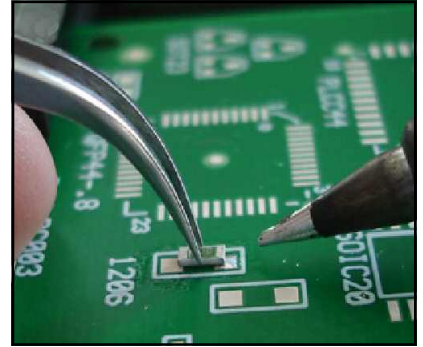(i) Describe **two** reasons for changing the drill speed.

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_____

_____

_____

(ii) Outline **two** safety features integrated into a pillar drill.
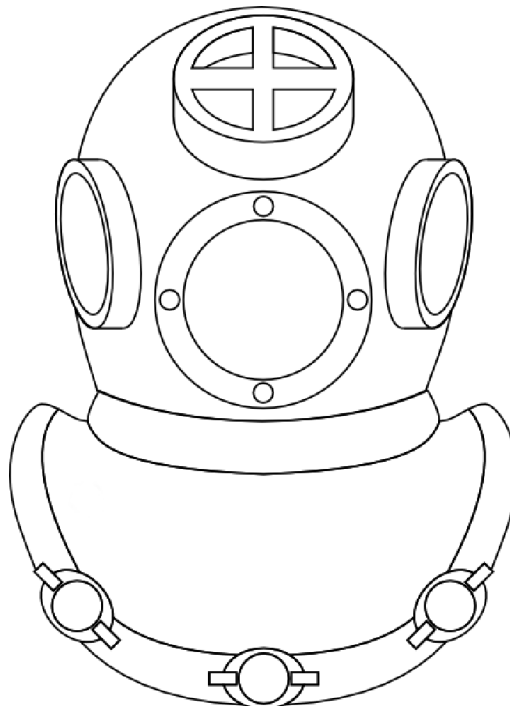
_____

_____

_____

13. Make well-proportioned freehand sketches of **two** principal orthographic views of the stepper motor shown.

14. Draw a work breakdown structure to show the steps required to populate a PCB board in a Technology Room having due regard to health and safety requirements.

15. The graphic shows a vintage diving helmet made from metal and glass. Use **two** graphic techniques to enhance the representation of the helmet.

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