Materials required for this examination:
- normal writing and drawing instruments
- a calculator
- a protractor.

Instructions to candidates:
- Use black ink or black ball-point pen. Use pencil only for drawing.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write on blank pages.
- Do all rough work in this book. Cross through any work that you do not want to be marked.

Information
- The marks for questions are displayed.
- The maximum mark for this paper is 131.
- There are 22 marks for Section A, 37 marks for Section B and 72 marks for Section C.

This example examination paper can be duplicated and printed out if required but not edited in any way.
The links to www.technologystudent.com cannot be removed.
The PDF file can be stored on school / college systems and distributed electronically (NO EDITING ALLOWED)
PLEASE RESPECT THE COPYRIGHT - report infringers to techteacher@technologystudent.com
Not be distributed at courses or by course instructors / consultants
The questions to follow are multiple choice. Tick one answer for each question.

1. Which one of the following energy production systems is a fossil fuel?

A. Wind Power
B. Hydraulic Fracturing
C. Nuclear Power
D. Hydroelectricity

2. The character below is standing still. What is this type of load?

A. Dynamic
B. Resting
C. Static
D. Shear

3. A thermosetting plastic is:

A. Once 'set' these plastics cannot be reheated to soften, shape and mould.
B. These plastics can be reheated up to four times, but no more.
C. These plastics can be re-heated and therefore shaped in various ways.
D. This is a composite plastic, made up of several layers.
4. From the list of materials, identify the material that includes chromium in its composition.

A. Copper
B. Nylon
C. Stainless steel
D. Lead

5. Which of the following names means, ‘materials on a very small scale’, on a scale of three atoms?

A. Small scale.
B. Micro-material
C. mini-substance
D. Nano

6. Which of the following statements describing ‘torsion’ is true?

A. Torsion is a ‘twisting’ force.
B. Torsion occurs when a material is stretched in a straight line.
C. Torsion is the ‘impact’ when two materials are knocked together.
D. Torsion is the term used to describe a rise in temperature of a material.

7. Which of the statements below is the definition of the physical property ‘Ductility’?

A. A ability of a material to resist impact when dropped .
B. The ability of a material to resist a stretching force.
C. The ability of a material to return to its original shape.
D. The ability of a material to change shape (deform) usually by stretching along its length.
8. Which of the following statements is representative of crowd funding?

A. A group of designers fund the manufacture of a new product
B. The person / company seeking funding, sets up a 'page' on a website and asks for financial support.
C. A number of companies directly sponsor a designer, in exchange for advertising.
D. The Government funds a designer through taxes.

Link to potential answer http://www.technologystudent.com/prddes_2/crowd1.html

9. Which of the following is the process called ‘etching’?

A. A process whereby paint is sprayed onto the surface of a material.
B. A process that changes the colour of the surface of a metal.
C. A process that creates a long-lasting protective coating on a metal.
D. Acid is used to slowly remove the unprotected surface of a metal, for a decorative finish.

Link to potential answer http://www.technologystudent.com/joints_flsh/etching1.html

10. What is the area of the square shown below?

A. 1000mm²
B. 10000mm²
C. 1100mm²
D. 10100mm²

11. Give two reasons why Flexi-ply is suitable for making ‘curved’ products such as furniture. 2 marks

Reason 1: ____________________________________________________________________________

Reason 2: ____________________________________________________________________________

12. Describe one practical application of polylactide (PLA). Include in your answer, how the environment will benefit from the use of this material 2 marks

Practical Application: __________________________________________________________________

Environmental Benefit: __________________________________________________________________

13. Hydraulic Fracking is a method of extracting oil and gas from rocks below the earth’s surface. Give two reasons why some people support this technique. 2 marks

Reason 1: ____________________________________________________________________________

Reason 2: ____________________________________________________________________________
14. Give two reasons why some people are not in favour of hydraulic fracking.  2 marks

Reason 1:  

Reason 2:  

15. This question is about using ratios to scale drawings? What is the ratio of height to length of the rectangle? You will gain marks for the calculation and your written explanation of the calculation.

4 marks

EXPLANATION:  


PAGE 9
16. Select one of the materials listed above.

Name of Material

Describe your chosen materials manufacture. Include notes and a labelled sketch(s)
8 marks

TO HELP YOU ANSWER THIS QUESTION
http://www.technologystudent.com/joints/polyurethane1.html
http://www.technologystudent.com/prddes1/biopola.html
http://www.technologystudent.com/joints/poly2.html
17. Describe two processes that help to smooth / enhance the edge of a piece of 6mm thick acrylic. *Use notes and a sketch.* 2 x 2 marks

Process 1: _________________________________

______________________________

______________________________

Process 2: _________________________________

______________________________

______________________________

18. Select one of the products shown below. Then, describe two reasons, for it being suitable for manufacture in large numbers / mass production. 2 x 2 marks

TO HELP YOU ANSWER THIS QUESTION

PRODUCT: ________________

REASON 1: _________________________________

______________________________

______________________________
REASON 2: 


19. For the product you selected in question 18 - describe / explain the industrial process used in its manufacture. *The industrial process is listed under the product name.* 5 marks

TO HELP YOU ANSWER THIS QUESTION USE THE SAME LINKS AS QUESTION 18

INDUSTRIAL PROCESS: __________________________________________

DESCRIPTION OF MANUFACTURING PROCESS
INCLUDE NOTES AND A SKETCH(S)
20a. What is the difference between batch production and continuous production?  4 marks

TO HELP YOU ANSWER THIS QUESTION
Follow the links below.
http://www.technologystudent.com/joints/scalep1.htm

20b. Briefly describe the stages involved in the batch manufacture of a product of your choice  4 marks

TO HELP YOU ANSWER THIS QUESTION
Follow the links below.
http://www.technologystudent.com/joints/bat1.htm
http://www.technologystudent.com/joints/batch1.htm
21a. What is Computer Integrated Manufacture (CIM)? 4 marks

21b. Select a product that could be manufactured through Computer Aided Manufacture (CIM) and describe the stages involved in its manufacture 4 marks

PRODUCT:

DESCRIPTION:
The packaging seen below, has been designed to hold / store six ‘plastic’ bottles containing a natural fruit soft drink.
22. The packaging should have the following design features:

22a. Explain why the packaging should be **sustainable**.  
**2 marks**

22b. Explain why it would be an advantage for the packaging to be **educational**.  
**2 marks**

22c. Explain why the use of **colour and images** on promotional packaging, is an important design feature.  
**2 marks**

22d. The packaging should allow ease of stacking on a supermarket shelf and during transport.  
**2 marks**

22e. The packaging should **promote a healthy diet**.  
**2 marks**
23a. How is packaging used to promote products?
4 marks

23b. How could a QR code (Quick Response Code) be used to promote a product?
4 marks

TO HELP YOU ANSWER THIS QUESTION 
Follow the link below.
24a. With the aid of a diagram, explain how packaging can be printed through the process of lithography?  

24b. Give three reasons why the use of biodegradable ink is beneficial when printing on packaging.  

Reason 1:  

Reason 2:  

Reason 3:
25a. These questions are related to British Standards and European Standards (8 marks in total)

What is the British Standards Institute? 2 marks

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

25b. What is the British Standards Institute Kite Mark? Include a sketch. 2 marks

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

25c. What is the Conformite European Symbol? Include a sketch of the symbol. 2 marks

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

25d. How do the two standards differ? 2 marks

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
26a. What is meant by the term Quality Assurance? 4 marks

26b. What is meant by the term Quality Control? 4 marks
27. Below is a model of a typical village church. The roof of the tower is a square pyramid.

A. What is the area of one side of the square pyramid?

\[ \text{AREA} = \frac{1}{2} \times \text{BASE} \times \text{HEIGHT} \]

B. The labels X and Y represent the same part, one side of the square pyramid. Why does Y appear taller than X? 2 marks

---

To help you answer this question, follow the link below.

28a. Designers need an understanding of smart materials. Aroma Pigments have many practical applications. What are aroma pigments?  

28b. Describe two practical applications of aroma pigments.  

PRACTICAL APPLICATION 1: 

PRACTICAL APPLICATION 1: 

PRACTICAL APPLICATION 1: 

PRACTICAL APPLICATION 1: 

TO HELP YOU ANSWER THIS QUESTION Follow the link below.
http://www.technologystudent.com/joints/aroma1.html
29a. Designers invest time and effort, testing and evaluating a prototype. Why do designers test and evaluate?  

2 marks

---

TO HELP YOU ANSWER THIS QUESTION

Follow the link below.

http://www.technologystudent.com/despro_flsh/evalintegr1.html

---

29a. Describe two features / aspects of a design, that designers evaluate.  

2 x 3 marks

Feature/aspect 1:

---

Feature/aspect 2:

---
30. This is a simple pencil sharpener.

An two point perspective drawing of the sharpener has been started below.

Complete the outline of the sharpener.  
3 marks

Add appropriate pencil shading, to enhance the final finish.  3 marks