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| NAME AND SURNAME | GR 8 | Marks 127 | % |
| Parent's Signature: | | | |



PARKTOWN BOYS' HIGH SCHOOL

DESIGN AND TECHNOLOGY

Grade 8

2017 – JUNE EXAM

TIME: 90 MINUTES

100 MARKS

EXAMINER: MR C BOSSERT

MODERATOR: MR SCOTT

EXAMINED CONTENT:

TERM 1 – GRAPHIC COMMUNICATION

TERM 2 – STRUCTURES AND MATERIALS

PLEASE READ THE FOLLOWING:

- Check that you have all **7** pages with questions **1 to 17**
- **Write your name, surname and class in the section provided at the top of this page.**
- **Read through the whole paper carefully before you start writing.** Some questions might help you answer other questions!
- Look at the mark allocation for each question and make sure you answer accordingly.
- Write clearly and legibly and use the English language properly. Anything that is unclear will receive 0.
- All drawings must be done in sharp pencil, **5 marks will be deducted for drawings in pen.**
- You may not borrow stationery during the exam.
- If you do not know the answer to a question, leave it blank.
- Do not make drawings on this paper other than those required for the questions.
- Answer on the question paper.

Question 1**(14)**

Provide accurate definitions for the following:

1.1) A Structure

(3)

1.2) Internal Forces

(2)

1.3) Brownian Motion

(2)

1.4) Alloy

(2)

1.5) Inorganic Materials

(2)

1.6) Laminated Material

(3)

Question 2**(11)****Properties of Materials.** Write one word for the following definitions. Your answer must be written in the block next to the definition.

| | | |
|-------|--|--|
| 2.1) | The length to which a material can be drawn without breaking. | |
| 2.2) | The maximum force the material can stand in tension, compression, torque, of shear without breaking. | |
| 2.3) | The amount of shaping which can be done by hammering rolling or pressing without breaking or cracking. | |
| 2.4) | The resistance of the material to cutting and indentation. | |
| 2.5) | The amount of energy that the material can absorb without breaking and measures its ability to withstand shocks. | |
| 2.6) | Materials that have occurred due to the process of living growth. | |
| 2.7) | Metals containing iron. | |
| 2.8) | Forces that are in motion. | |
| 2.9) | A jointing method where different types of screws, nuts and bolts, rivets and various nail types are used. | |
| 2.10) | A jointing method where materials are joined by melting them together. | |
| 2.11) | Cob bricks and Concrete are examples of what kind of materials? | |

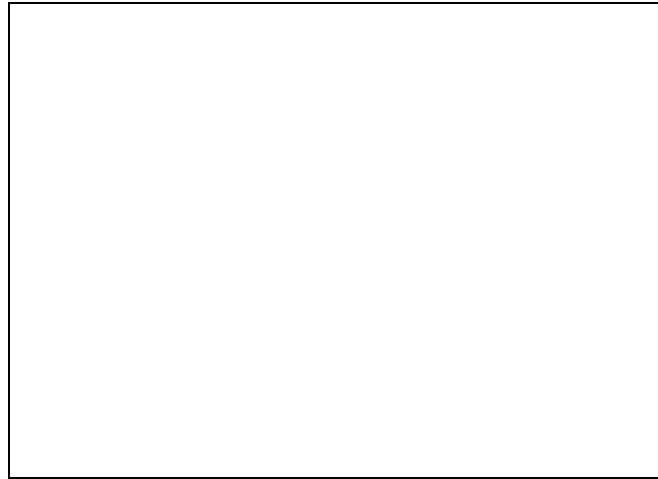
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Question 3

(7)

Draw a diagram of an atom in the space provided.

Very clearly label the different parts of the atom and the relative charges of each component.



Question 4

(6)

In the boxes below draw a neat diagram showing the spacing of atoms in the different phases of matter and label each box according to the phase of matter it represents.

| | | |
|------------------|------------------|------------------|
| | | |
| State of Matter: | State of Matter: | State of Matter: |

Question 5

(3)

What are three properties of ferrous metals?

1. _____
2. _____
3. _____

Question 6

(2)

Why do we use Alloys? Include an example of an Alloy in your answer and identify its components.

Question 7

(4)

What four factors affect the strength of a structure?

1. _____
2. _____
3. _____
4. _____

TOTAL PAGE:

Question 8**(9)**

Use the space provided to draw diagrams that describe the following external forces:

| | |
|------------------------------|--------------------------|
| Compressive Force (2) | Bending Force (3) |
| Shear Force (2) | Torque (2) |

Question 9**(8)**

Materials can be strengthened using a few methods including folding, rolling, moulding and creasing. In the boxes below, draw neat 3D pencil drawings of an "I" beam, an Angle Beam, a Box Tube and a Lipped Channel.

| | |
|-----------------|-----------------------|
| "I" Beam | Angle Beam |
| Box Tube | Lipped Channel |

Question 10**(4)**

Define the Line of Neutral Axis.

| |
|-------------|
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Question 11

(4)

Draw a diagram of a concrete post and lintel system. Assume that the concrete in this post and lintel system is reinforced. Label each component of your diagram and label the material used to reinforce the concrete lintel. Make sure that all your materials are placed accurately.



Question 12

(3)

What is a Torsion Box?

Question 13

(4)

Draw a neat labelled diagram showing the cross-sections of both a surfboard and a bird's feather. Label the similarities between these two structures.

| Bird's Feather | <i>Similarities</i> | Surfboard |
|----------------|---------------------|-----------|
| | | |

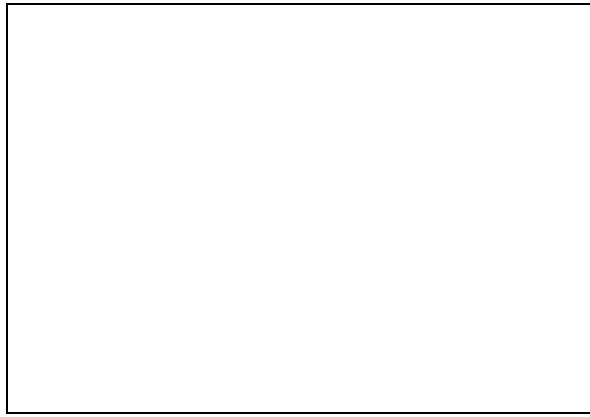
Question 14

(2)

What is the strongest structural frame geometry?

Question 15**(3)**

Using a simple, neat labelled diagram, demonstrate how a quadrilateral structure may be stabilised.

**Question 16****(16)**

On the following page titled “One Point Perspective”, use the human figure provided to draw a well-proportioned internal one point perspective drawing. **Please LABEL each element so that you can have a clear mark allocation.** Remember to use a **sharp pencil** and **make light working out lines**.

You will receive marks for including the following elements accurately:

1. The Picture Frame Line around the human figure (2)
2. Put in the room dimensions (ceiling, floor and walls) (2)
3. Put in a door on the right hand side wall (2)
4. Put a window in the wall on the left hand side (2)
5. Put in a table under the window on the left hand side wall (2)
6. Put a picture/art canvas on the left hand wall (2)
7. Put a carpet with tassels on the floor (2)
8. **Shade only the table** as though there were a light source coming from the top right (2)

► END OF PAPER ◀
127 TOTAL MARKS

TOTAL PAGE:

ONE POINT PERSPECTIVE



TOTAL PAGE: