



education

Department of
Education
FREE STATE PROVINCE

PRACTICAL TASK

GRADE 10

TECHNICAL SCIENCES

SEPTEMBER 2018

MARKS: 30

TIME: 1 HOUR

This paper consists of 6 pages.

Name of learner:

Grade:

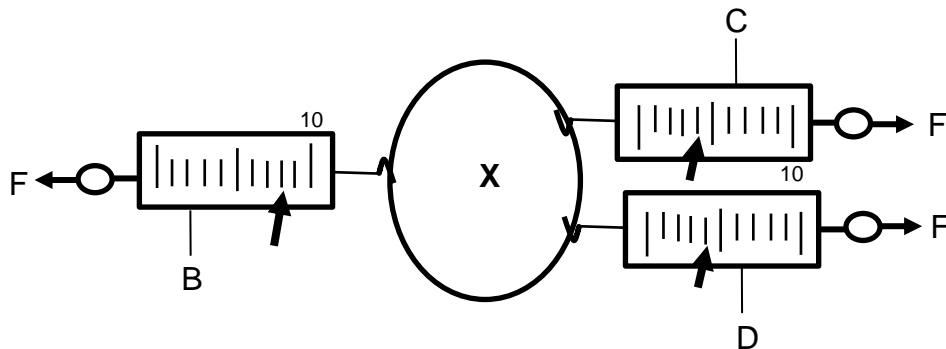
INSTRUCTIONS AND INFORMATION

1. Write your name and grade in the appropriate spaces on the FRONT PAGE of this question paper.
2. Answer ALL questions in the spaces provided in THIS QUESTION PAPER.
3. You may use a non-programmable pocket calculator.
4. You may use appropriate mathematical instruments.
5. Show ALL the formulae and substitutions in ALL calculations.
6. Round off your final numerical answers to a minimum of TWO decimal places where necessary.
7. Give brief motivations, discussions, et cetera where required.
8. Formulae that you might need are as follows:

Torque / Moment of force <i>Draaimoment /</i> <i>Wringkrag</i> <i>/Kragmoment</i>	$\tau = F \times d_{\perp}$ OR / OF Moment = Force x perpendicular distance <i>Moment = Krag x loodregte afstand</i>
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QUESTION 1

Learners in a Grade 10 Technical Sciences class conduct an investigation. They are investigating the effect that three FORCES have on object **X**. To do this, three similar pieces of apparatus, **B**, **C** and **D**, calibrated in newton, are used. **B**, **C** and **D** are connected to a ring **X** and forces are applied to **B**, **C** and **D** as indicated. Ring **X** is in EQUILIBRIUM.



1.1 Write down the name of apparatus **B**.

_____ (1)

1.2 What is the SI unit of force in words?

_____ (1)

1.3 By looking at readings on **C** and **D**. What is the magnitude of the **TOTAL** force that was exerted to the right of **X**?

_____ (1)

1.4 What is the scientific term for the total force referred to in Question 1.3?

_____ (2)

1.5 Represent the vector sum of the readings on **C** and **D** graphically.

_____ (3)

- 1.6 Representing the reading on **B**. What is the magnitude of the force that was exerted to the left on ring **X** to keep it in equilibrium?

_____ (1)

- 1.7 How does the force referred to in Questions 1.3 and 1.6 compare?

_____ (2)

- 1.8 What is the scientific term for the force that was registered on **B**?

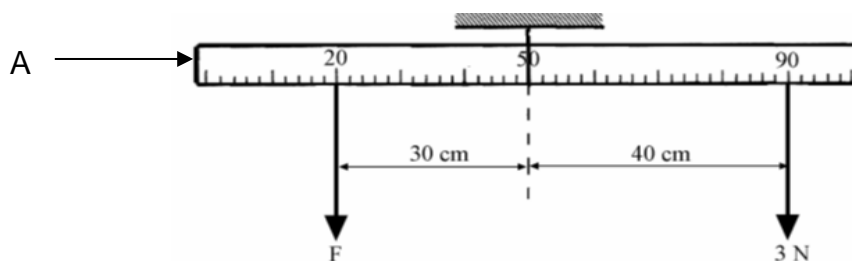
_____ (1)

- 1.9 What conclusion can be drawn about the three forces registered on **B**, **C** and **D**?

_____ (3)
[15]

QUESTION 2

- 2.1 A group of grade 10 learners' use two mass pieces, and apparatus **A** to prove the law of moments.



- 2.1.1 Write down the name of apparatus **A**.

_____ (1)

2.1.2 To prove the law of moments, the learners have to follow the steps below which are INCORRECTLY arranged:

1.	Attach two mass pieces and adjust their positions until the metre stick balances.
2.	Note the position and force of each object.
3.	Show mathematically that the force multiplied the distance clockwise equals the force multiplied by the distance anti-clockwise.
4.	Hang a metre stick from the 50 cm mark as shown

Correct the sequence by writing down the numbers in the spaces below as they are supposed to follow each other.

First step					Last step
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(2)

2.1.3 In order for the learners to prove the law of moment what should the magnitude of **F** be?

(2)

The learners replace the mass piece on the right with a bigger mass piece and keep the rest of the apparatus as they are. They then realised that in order to keep the magnitudes of the moments the same as in question 1.3 the 40 cm distance must change as well.

2.1.4 Compare the new distance with the original 40 cm. Write down only GREATER THAN, SMALLER THAN or EQUAL TO 40 cm

_____ (1)

2.1.5 For the above investigation, write down the following:

Controlled variable _____ (1)

Dependant variable _____ (1)

Independent variable _____ (1)

2.1.6 What is the conclusion for this investigation?

(2)

2.2 The following objects are used in our everyday lives. Which one of the following doesn't involve a lever? Give a reason for your answer



stapler



wheelbarrow



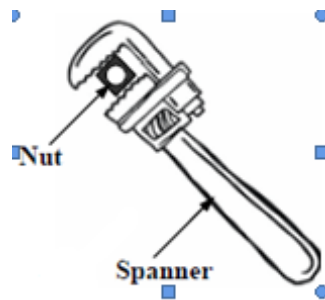
traffic cone



scissors

(2)

2.3 The diagram shows a spanner and nut. Complete the sentences below:



2.3.1 The further away from the fulcrum (turning point) you apply a
_____ the easier it is to turn a nut. (1)

2.3.2 The use of a spanner to turn a nut is an everyday example of
using a _____. (1)

[15]

GRAND TOTAL: 30