



CANDIDATE ID _____

NEW ZEALAND MARITIME SCHOOL

**STCW 78 (as amended in 2010)
REG. III/ 2 (UNLIMITED)**

MARINE ENGINEERING

**MECHANICAL TECHNOLOGY
Code 942.594**

Time allowed: *1.5 hours (10 minutes extra for reading the paper)*

Supplied: *Formula Sheet and graph paper*

Instructions: *Candidates may bring drawing instruments to the examination.*

All questions are compulsory and carry equal marks. The minimum score to be considered competent is 60%. Answers entered in this booklet must be completed in ink. Sketches may be completed in pencil.

Any additional pages used should be attached to this completed booklet and handed to the invigilator at the end of the time period.

Q		MARKS
1		
2		
3		
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TOTAL		

RESULT	Competent	Not Yet Competent
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1. A shaft runs at 50 rev/s in bearings 100mm diameter, the total load on the bearings is 25kN and the coefficient of friction is 0.04. Calculate;

a) The friction force at the skin of the shaft

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b) The work done to turn the shaft one revolution

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c) the work lost to friction every second

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d) the equivalent kW power loss

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2 (a) What load can be lifted by an effort of 120N, if the velocity ratio is 22 and efficiency of the machine at this load is 70%.

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(b) Determine the law of the machine, if it is observed that an effort of 125N is required to lift a load of 2000N.

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(C)Find the effort required to run the machine at a load of 3KN

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If maximum allowable shear stress in each bolt is 180 MN/m^2 , find the minimum diameter of the bolts?

This image shows a full page of a handwriting practice worksheet. It consists of multiple sets of three horizontal dotted lines spaced evenly down the page, providing a guide for letter height and placement. The background is plain white, and there are no other markings or text present.

- I. The torque.
- II. The speed of the rope (or load) in meters per second.
- III. The work done per minute.
- IV. The power required for the load.
- V. The efficiency of the lifting machine if an electric motor of 7.5 KW is required to drive the lifting machine.

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Take density of sea water as 1.025 g/ml.

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