NAME …………………………………………………………….ADM ………………..

**JUJA GIRLS HIGH SCHOOL**

**MID TERM III EXAMS 2018**

**FORM 3 PHYSICS**

INSTRUCTIONS

* ***Answer all questions in the spaces provided.***
* ***Non programmable silent electronic calculators may be used.***
1. The figure below shows a trolley of weight 20N pulled by a force of 4N from the bottom to the top of an inclined plane at a uniform speed.

 Effort, E

 Weight, W h=5m

 D=40m

1. i)State the value of the force acting downwards along the inclined plane.(1mk)

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ii)Explain how the value in part (i) is obtained. (2mks)

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1. For the system, determine the:

i)mechanical advantage. (3mks)

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ii)velocity ratio (3mks)

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iii)efficiency. (2mks)

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1. An electric crane lifts a load of 2000kg through a vertical distance of 3.0m in 6s.
2. Determine:

i)work done. (1mk)

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ii)power developed (2mks)

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iii)efficiency of the crane if it is operated by an electric motor rated 12.5kw. (2mks)

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1. A bob of mass 20kg is suspended using a string of 4m from a support and swings through a vertical height of 0.9m as shown below.

 4m

 0.9m

 Determine:

 i)the potential energy of the body at its position. (2mks)

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 ii)speed of the body when passing through the lowest point. (2mks)

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1. The circuit diagram below shows a battery of emf 12V and internal resistance 2Ω. It is connected to a system of resistors as shown.

 12V

 2Ω

 2Ω 6Ω A

 3Ω

1. Calculate the effective resistance. (3mks)

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1. Find the current registered by the ammeter. (3mks)

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1. Determine the current through the 6Ω resistor. (2mks)

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1. Three capacitors, a 2µF and two 3µF capacitors are connected as shown. Find the effective capacitance. (3mks)

 2µF 3µF

 3µF

 12V

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1. State ***three*** factors affecting capacitance of a parallel plate capacitor. (3mks)

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1. The diagram below shows a circuit containing three capacitors.

 C2

 X C1 Y

 C3

1. Write an expression for effective capacitance between X and Y. (2mks)

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1. If C1 = 6µF, C2 = 4.5µF and C3 = 5µF ; Calculate the charge stored when point XY is connected in series with a battery of 6V. (3mks)

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1. a)What do you understand by the term e.m.f of a cell? (1mk)

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b)A cell of e.m.f **E** and internal resistance **r** is used to pass a current through various resistors **R** Ohms and the values of current recorded in the table below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| R (Ohms) | 1.6 | 2.1 | 2.5 | 3.6 | 5.0 | 8.0 |
| I(A) | 1.0 | 0.8 | 0.7 | 0.5 | 0.37 | 0.24 |
| $\frac{1}{I}$(A-1) |  |  |  |  |  |  |

 i)Complete the table for the values of $\frac{1}{I}$ giving your answer to 3 d.p. (3mks)

 ii)Plot a graph of $\frac{1}{I}$ versus **R.** (5mks)

 iii)Given that the equation **E = I(R + r)**, use your graph to determine the values of **E** and **r**. (5mks)

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