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**GASABO DISTRICT**

**DISTRICT COMPREHENSIVE ASSESSMENT, RTQF LEVEL 4, 2022-2023**

**TRADE: NETWORKING**

**MODULE: PHYMP401 MECHANICS AND PROPERTY OF MATTER**

**DATE OF EXAM: ………………………… Duration: ……… 3hrs**

**ACADEMIC YEAR: 2022-2023**

**INSTRUCTIONS:**

* Read carefully the exams before answering
* It is illegal for candidate to write anything on question paper
* A candidate should answer in the language in which the examination is set.
* The paper is composed of three (3) sections as follows:
* Section A: Attempt all the twelve (12) questions 55marks
* Section B: Attempt any three (3) questions out of four(4) 30 marks
* Section C: Attempt only one (1) questions out of three (3) 15marks

**Note:**

Every candidate is required to carefully comply with the provided assessment instructions

**SECTION A: ANSWER ALL QUESTIONS**

1. Define the following terms: /**6marks**
2. Force
3. Inertia
4. moment of the force
5. **a.** Distinguishes between static friction and kinetic friction **/4marks**

b. Distinguish between internal and external forces and give one example for each

**3.** a. State Newton’s first law of motion **/4marks**

b. State Newton’s third law of motion

4. a. Differentiate static equilibrium and rotational equilibriums

b. Give necessary conditions for equilibrium of an object /**4marks**

5. Using the moment formula how can I calculate the weight required to be applied at 80 cm mark of 500 cm meter ruler to keep it in a balanced position if a weight of 2 N is changed from 20 cm mark of the same ruler? **/4marks**

6. What is the S.I unit of moment of the force? /**1mark**

7. a. What is free body diagram means? Explain them with figure

b. Determine the acceleration produced by a body whose mass is 200 g and its force is 40 N /**6marks**

8. Complete the following table by contact force/ non-contact force /**5marks**

|  |  |  |
| --- | --- | --- |
|  | **Force** | **Types of force** |
| 1 | Normal force |  |
| 2 | Electrostatic force |  |
| 3 | Tension force |  |
| 4 | Gravitational force |  |
| 5 | Friction force |  |

9.Define the term “stress”. What is its S.I unit? /**4marks**

10.Give three types of elastic modulus **/3marks**

11.Find the shear modulus of sample under a stress of 0.0004Pa experiencing a strain of 0.05. /**4marks**

12. Convert 300 degree kelvin into degree Celsius./**3 marks**

**SECTION B. ANSWER ONLY 3 QUESTIONS**

13.a.If you apply a net force 3N on 100g box,what is the acceleration of the box? /**10marks**

b. Calculate the magnitude of the force F on the right arm of the seesaw below:

6m 8m

120N F

14. a. Distinguish between temperature and heat /**10marks**

b. State Archimede’s principle.

c. Give three applications of Archimede’s principle.

15. a. Why does a piece of dry wood float on water? **/10marks**

b. A cylindrical metal has a diameter of 14cm and height of 5cm.Find its mass if its density is 19g/cm cubic.(take π=).Express the answer in kg

16. a. Define pressure /**10marks**

b. What is its S.I unit?

c. A force of 10N is exerted on the ground. The area in contact with the force is 0.0002m squared. Calculate the pressure exerted by the force.

17.a.Define the term”viscosity” /**10marks**

b.State the continuity equation

c.Suppose water is flowing through a pipe of diameter 1cm with a flow velocity of 2m/s.If the pipe widens of diameter of 3cm,what is the new velocity?

18.a.Name the instrument used to measure pressure in fluid. **/10marks**

b.The weight of a stone in air is 1N.When the stone is wholly immersed in water its weight is 7N.

i.What is the weight of water displaced?

ii.Determine the mass of displaced water.(take 1kg of water to weigh 10N)

**SECTION C: ANSWER ONLY 1QUESTION /15MARKS**

19. a.Explain the term specific heat capacity

B.what would be the final temperature if a 2kg piece of lead at 200degree Celsius is inserted in container with 10kg of water at 50 degree Celsius. Assume that there is no heat loss to the surrounding environment.(for lead,c=128J/Kg degree Celsius and water,c=4186J/Kg degree Celsius)

20. Describe how you carry out the experiment to determine

i.the volume of the stone

ii.the mass of the stone.

21.State the following laws:

i.Boyle’s law

ii.Charle’s law

iii.Gay-Lussa’s law

Iv.Equation of state of an ideal gas.

***GOOD LUCK!!!!!!!***