Candidate's Examination Number.....

SMZ

ZANZIBAR EXAMINATIONS COUNCIL

FORM THREE ENTRANCE EXAMINATION

054 ENGINEERING SCIENCE

TIME 2:30 HOURS SATURDAY, 07th DECEMBER 2019 A.M

INSTRUCTIONS TO CANDIDATES

1. This paper consists of three (3) sections A, B and C.
2. Answer ALL questions in sections A, B and C.
3. ALL answers must be written in the spaces provided.
4. Write your examination number on every page.
5. Calculators and cellular phones are not allowed in the examination room.
6. Use a blue or black pen in writing, drawing must be in pencil.

FOR EXAMINER'S USE ONLY					
QUESTION NUMBER	**MARKS**	**SIGNATURE**	**QUESTION NUMBER**	**MARKS**	**SIGNATURE**
1			**8**		
2			**9**		
3			**10**		
4			**11**		
5			**12**		
6			**13**		
7			**14**		
TOTAL					

This paper consist of 12 printed pages

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SECTION A: (10 Marks)

Answer ALL questions in this section.

1. Choose the correct answer and write its letter in the table below.

i) A man presses more weight on earth at

A. Sitting position B. Standing Position
C. Lying Position D. None of these

ii) A piece of ice is dropped in a vessel containing kerosene. When ice melts, the level of kerosene will

A. Rise B. Fall C. Remain Same D. None of these

iii) If Ali runs 100 m in 20 seconds, how fast has he travelled?

A. 5 m/s B. 100 m/s C. 2000 m/s D. 0.2 m/s

iv) Product of Force and Velocity is called:

A. Work B. Power C. Energy D. Momentum

v) Which one of the following has the highest value of specific heat?

A. Alcohol B. Methane C. Kerosene D. Water

vi) The rotational effect of a force on a body about an axis of rotation is described in terms of the

A. Centre of gravity B. Centripetal force

C. Centrifugal force D. Moment of force

vii) Which law is also called the law of inertia?

A. Newton's first law B. Newton's Second Law

C. Newton's Third Law D. All of these

viii) Energy possessed by a body in motion is called

A. Kinetic Energy B. Potential Energy

C. Both A and B D. None of these

ix) Forces can do many things to a moving tennis ball. Which of the following can be done by force?

A. To change mass of an object B. To change shape of an object

C. To change speed of an object D. To change direction of an object

x) Which of these is the correct formula for speed?

A. speed = distance x time B. speed = distance ÷ time

C. speed = time x distance D. speed = time ÷ distance

ANSWERS

i	Ii	iii	iv	v	vi	vii	viii	ix	x

SECTION B: (45 Marks)

Attempt ALL questions in this section

2: a) State the law of flotation.

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b) The weight of body in air is 4.9N; when it is totally immersed in water its weight

becomes 3.1N. Calculate the up thrust acting on the body.

3: Two (2) forces of 60N and 80N acting at 75^0 to each other. Draw a vector diagram to illustrate the resultant of these two forces.

4: What does pressure due to solid depend on?

5: a) State any two (2) units used to express the volume of a liquid.

b) Calculate the volume of a cylindrical solid having a diameter of 14cm and a length of 10cm ($\boldsymbol{\pi} = \frac{\mathbf{22}}{\mathbf{7}}$)

6: Briefly explain the following,

i) Transparent materials

ii) Translucent materials.

7: A Beaker contain 262.5cm^3 of a certain liquid weigh 410g, if the mass of an empty dry beaker is 200g, find the density of the liquid.

8: a) Define an error.

b) Briefly explain how zero error occurs?

9: State the law of conservation of energy.

10: a) Define the term work.

b) A man lifts a load of 21g through a height of 3m. Calculate the work done.

SECTION C: (45 Marks)

Attempt ALL questions in this section

11: a) Define a simple machine.

b) Efficiency of a machine is always less than one hundred percent. Give the reason(s).

c) The handle of a screw jack is 35cm long and the pitch of the screw is 0.5cm. What an effort must be applied at the end of the handle when lifting the load of 2200N if the efficiency of the machine is 0.4.

12: a) (i) Define linear momentum

(ii) Write the unit of linear momentum.

b) State the principle of conservation of linear momentum.

c) A ball A of mass 100g moving with a velocity of 5m/s make a head on collision with

a ball B of mass 200g moving with a velocity of 1m/s in the opposite direction. If A and B stick together after the collision, determine their common velocity in the direction of A.

13: a) Distinguish between series arrangement and parallel arrangement of resistors

b)

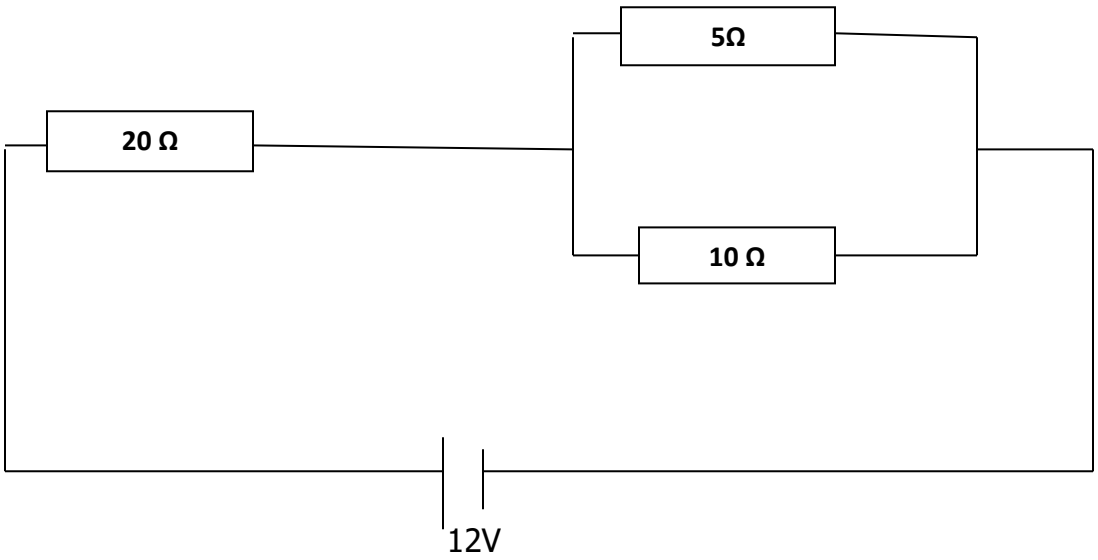

Figure 1:

From the figure 1 above, calculate

i) Equivalent circuit resistance.

ii) Current flowing through each resistor.

iii) Power dissipated in 20Ω resistor.

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