



In partnership with

GENERAL FOUNDATION PROGRAMME

PLACEMENT TEST SAMPLE QUESTION PAPER

ACADEMIC YEAR 2018 – 2019

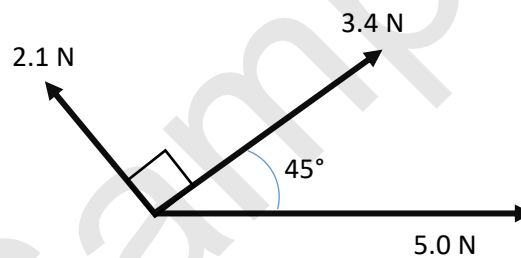
PHYSICS

Introductory Remarks:

- You are asked to answer twenty (20) questions.
- Please answer all question within the allocated time period of 90 minutes.
- Use only calculators CHECKED and APPROVED by the Exam In-Charge.
- Mark your correct answers on the answer booklet which is provided with the question paper. Show your complete work to get the full marks for each question.
- Please leave all items on the desk at the end of the test.

1. What is the result of adding the lengths of 2 cm, 55 mm, and 2.5 m? Express your answer in centimetres.
2. Select a correct example of:

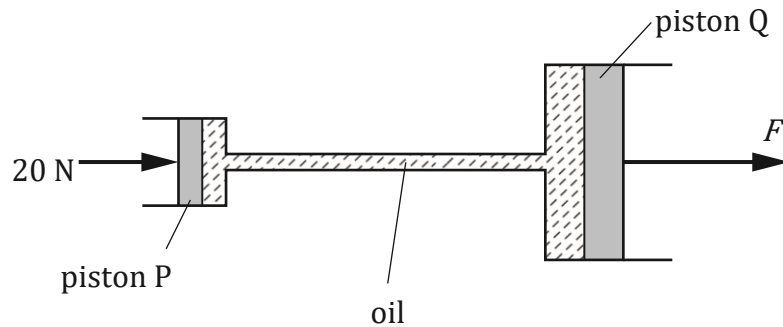
a.) A base quantity	mole	length	kilogram
b.) A scalar quantity	torque	velocity	energy
c.) A vector quantity	mass	weight	density
3. A student walks at a constant speed. He takes 90 Seconds to walk 150 paces. The length of each pace is 0.80 meters. How long will it take for the student to walk 60 meters?
4. A solid of dimension 15 cm by 0.03 m by 0.05 cm has a mass of 25 g. Determine the density.
5. Three forces act at a point as shown. Calculate the magnitude of the resultant vector.



6. What is the direction of the resultant force in the system shown in **question #5**?
7. A 2.0 kg mass has 300 J of kinetic energy. What is the speed of the mass?
8. The value of g at the surface of earth is 9.78 N/kg, and on the surface of Venus the magnitude of g is 8.6 N/kg. A cosmonaut weighs 590 on the surface of the earth. What will her weight be on the surface of Venus?

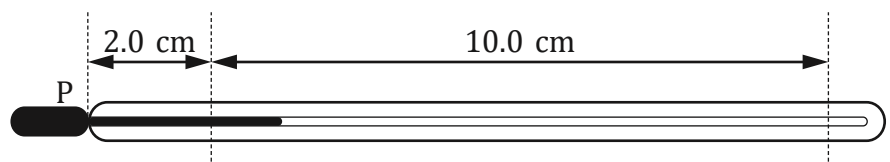
9. The diagram shows a simple model of the braking system of a car. A force of 20 N is applied to piston P. As a result, there is a force F on piston Q. Piston P has an area of 5.0 cm^2 and piston Q has an area of 25 cm^2 .

What is the force F ?



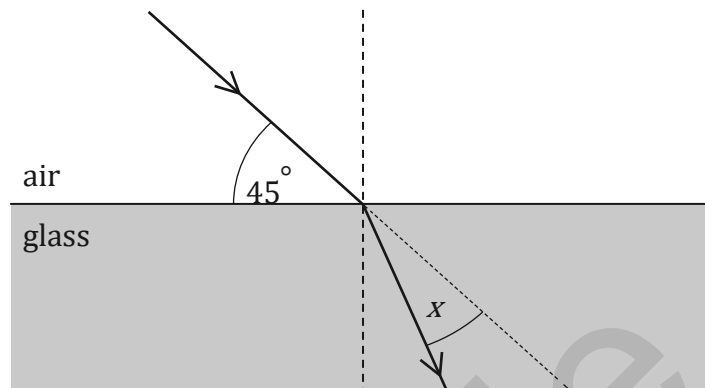
10. A man weighing 600 N runs up the hill. It takes him 20 s to reach the top which is 15 m from the ground. Calculate the **work** he has done and the **power** output of his legs.
11. A rocket of mass 1000 kg carries 800 kg fuel at take-off. If the thrust T from the engines is 22 000 N, calculate the initial acceleration of the rocket.
12. An object of mass 10 kg moving at 25 m/s collides with a stationary object of mass 15 kg. The first object rebounds at 10 m/s. Calculate the velocity of the second object after collision.
13. In a liquid-in-glass thermometer, the liquid column is 2.0 cm long at 0°C and it expands 10.0 cm when heated to 100°C .

Measuring from P, how long is the liquid column at 30°C ?



14. The intensity of light at a distance 1.3 m from a lamp is 1.0 Wm^{-2} . Calculate the output power of the lamp.

15. A ray of light is incident on the surface of a glass block, as shown in the diagram below.

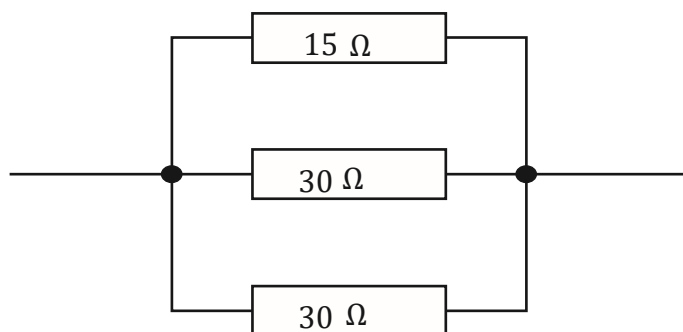


The refractive index of the glass is 1.5. The light ray changes direction when entering the glass. What is the angle x through which the ray moves?

16. When the flash on a camera is used, a charge of 1.5 C flows through the flash-tube in 0.0030 s. The average voltage across the flash-tube is 3600 V. What is the electrical energy supplied to the flash-tube and what is the average power supplied?

17. A 1.0 m length of wire of cross-sectional area 0.40 mm^2 has a resistance of 2.0Ω . What is the resistance of a 0.50 m length of wire, of the same material, with a cross-sectional area of 0.80 mm^2 ?

18. The diagram shows three resistors in parallel. What is the combined resistance?



19. The diagram shows the information found on an electric kettle. What is the frequency of the electrical supply used to power the kettle?

240 V	50 Hz
600 W	700 cm ³

20. A source contains a radioactive material. Without the radioactive source present, a detector records a background count rate of 20 counts per minute. This source is placed in a fixed position near the detector. Initially a count rate of 520 per minute is recorded.

What count rate is recorded after a time of two half-lives of the radioactive source?

END OF EXAMINATION