Physics
Science Paper- 1

Maximum Marks: 80

Time allowed: Two hours

Answers to this paper must be written on the paper provided separately.

*You will **not** be allowed to write during the first **15 minutes.***

This time is to be spent in reading the question paper.

The time given at the head of this Paper is the time allotted for writing the answers.

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*Attempt **all** questions from **Section A** and any four questions from **Section B**.*

The intended marks for questions or parts of the questions are given in brackets [ ].

SECTION - A (40 Marks)

(Attempt **all** questions from this Section.)

Question 1 **[15x1=15]**

a) Relative density is also termed as

i) Specific density

ii) Specific gravity

iii) Specific mass

iv) Special density

b) We are not crushed under the weight of air because

i) air has no weight.

ii) the pressure inside our bodies is equal to atmospheric pressure.

iii) the pressure inside our bodies is more than atmospheric pressure.

iv) Adapted to the surroundings

c) 1 kgf is equal to

i) 98 N

ii) 9.8 N

iii) 0.98 N

iv) 0.098 N

d) Which of the following has highest kinetic energy?

i) Particles of steam at 100^0 C

ii) Particles of water at 100^0 C

iii) Particles of ice at 0^0 C

iv) Particles of water at 0^0 C

e) Liquid pressure in a vessel increases with:

i) density of the liquid

ii) size of the container

iii) depth of the liquid

iv) both (i) and (iii)

f) As the speed of the body becomes three times, it's kinetic energy increases by

i) 3 times

ii) 9 times

iii) 1/3 times

iv) 1/9 times

g) The relative density of alcohol is 0.8. It's density will be:

i) 0.8

ii) 800 g / cm^3

iii) 800 kg / m^3

iv) 0.8 kg / m^3

h) The atmospheric pressure at sea level is nearly:

i) 10 Pa

ii) 100, 000 Pa

iii) 100 Pa

iv) 10,000 Pa

i) The force exerted on a normal human being due to atmospheric pressure is

i) 2×10^4 N

ii) 2×10^5 N

iii) 2×10^6 N

iv) 10^5 N

j) If in a tug-o-war, when two teams are pulling a rope, and the rope does not move towards any team, it implies that:

i) equal force is being applied in the same direction

ii) equal force is being applied in opposite direction

iii) no force is applied in any direction

iv) cannot be explained

k) When a rubber sucker is pressed on a plane surface than it sticks to the surface because of

i) the pressure exerted by us

ii) the air sucked by rubber

iii) the pressure of atmosphere acting on it

iv) it's unique shape

l) Pushing a rock from a hill top is an example of:

i) muscular force

ii) magnetic force

iii) frictional force

iv) electrostatic force

m) The force exerted by the earth to pull the object towards itself is called

i) electrostatic force

ii) gravitational force

iii) muscular force

iv) contact force

n) **Assertion**: To float; a body must displace liquid whose weight is equal to the actual weight.
Reason: The body will experience no downward force in that case.

A. Both assertion and reason are true and reason is the correct explanation of the assertion.
B. Both assertion and reason are true but reason is not the correct explanation of assertion.
C. Assertion is true but reason is false.
D. Both assertion and reason are false.

o) Assertion: The energy possessed by a rolling stone is kinetic energy.
Reason: The kinetic energy possessed by an object is due to it's motion.

A. Both assertion and reason are true and reason is the correct explanation of the assertion.
B. Both assertion and reason are true but reason is not the correct explanation of assertion.
C. Assertion is true but reason is false.
D. Both assertion and reason are false.

Question 2

[15 marks]

a) The atmospheric pressure on earth's surface is nearly_____ [1]
b) In a door, handle is provided _____ from the hinges. [1]
c) The energy of a body is its capacity to do_____. [1]
d) Power spent by a body depends on the _____ for which it does work. [1]
e) The temperature of a substance remains _____ during its change of state. [1]
f) The S.I unit of pressure is_____. [1]

g) Why solids have fixed shape but liquids and gases do not have fixed shape? [2]

h) Why does a piece of ice float on water? [2]

i) i) Distinguish between density and relative density. [2]
ii) Define density bottle. [1]

j) State the factors on which the pressure at a point in a liquid depends. [2]

Question 3

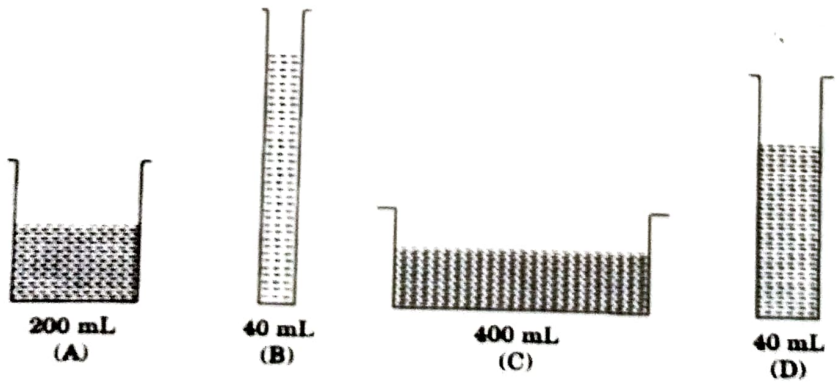
[5x2=10]

a) Two bodies of same masses are placed at height h and 2h. Compare their gravitational potential energy. [2]

b) Distinguish between evaporation and boiling? [2]

c) Calculate the volume of wood of mass 6000kg if the density of wood is 0.08g/cm^3 [2]

d) Observe the figure below carefully: [2]



Volume of water in each vessel is shown above.
Arrange them in order of decreasing pressure at the base of each vessel.
Explain the reason.

e) An electric bulb of 60 W is lighted for 10 hours every day. How many units of electrical energy is consumed by this bulb in one day? [2]

SECTION B (40 Marks)

Attempt any **four** questions

Question 4

a) State and explain the three factors that affect the rate of evaporation of a liquid. [3]
b) Explain with the help of an example, why temperature remains constant during interconversion of states of matter? [3]

c) i) Why do camels or elephants have broad feet? [2]

ii) How is force of adhesion different from force of cohesion? [2]

Question 5

a) Why an iron needle sinks in water but a ship made of iron floats on water? [3]

b) Calculate the density of a solid of mass 84.2g. The initial volume of water in measuring cylinder is 24ml and final volume of water when solid is completely immersed in water is 60ml. [3]

c) i) How can submarines sink and rise to the water surface at their own will? [2]

ii) Which will occupy more space: 480 g of teak wood of density 0.48 g/cm^3, or 7900 g of iron of density 7.9 g/cm^3? [2]

Question 6

a) Give reasons for the following:
i) Deep sea divers wear specially designed suits before diving into the sea. [3]

ii) The spanner or wrench has a long handle.

b) A boy weighing 50 kgf stands on a platform with dimensions 2.5 cm x 0.5 cm. What pressure in Pascal does he exert? [3]

c) i) What do you mean by atmospheric pressure? [2]
ii) Why do bubbles appear when a liquid is heated? [2]

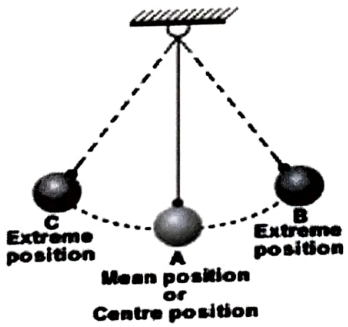
Question 7

a) State two conditions with examples when no work is done by the force. [3]

b) A man climbs a staircase in 30s whereas his brother takes 40s for the same task. Compare the work done by both of them and the power spent by them while doing the task. [3]

c) i) Calculate the height through which a body of mass 40kg can be lifted when 800 J of work is done on it? ($g=10m/s^2$) [2]

ii) In reference to the fig: [2]



List the energy transformations taking place in simple pendulum at the points A,B and C.

Question 8

a) i) State law of conservation of energy. [1]
ii) A girl completes 360 J of work for 0.6 minutes. Calculate her power. [2]

b) i) How does the effect of a force differ when it is applied on a rigid body and a non-rigid body? [3]
ii) Why is it comfortable to lift a school bag with broad straps than thin straps?

c) i) What do you mean by 'the change of state'? [1]
ii) Draw a flow chart showing the complete cycle of change of state. [3]

Question 9

a) i) What is the magnitude of thrust required in newton to produce a pressure of 26500Pa on an area of 100cm^2? [2]
ii) How is thrust related to pressure? [1]

b) Explain why is it easier to lift a stone under water than in air? [3]

c) What types of energy transformation takes place in the following? [4]

1) Electric heater
2) Solar cell
3) Steam engine
4) Hydroelectric power station