**MIDWAY BOYS & JUJA GIRLS SCHOOLS**

**R.A.T TERM II 2017**

**FORM ONE PHYSICS**

***Answer all questions***

1. A body of mass 90kg weighs 150N on a certain planet. What is the acceleration due to gravity on that planet? (3mks)
2. A force of 4N causes an extension of 2.5cm on a single spiral spring. What is the extension in the arrangement below if the springs are identical and of negligible weights. (3mks)

 12N

3) Define pressure and state its SI units. (2mks)

4) Explain the following:

 a) Walls of a dam are designed to be curved (1mk)

 b) Dam walls are thicker at the bottom than at the top. (1mk)

 c) Trucks that carry heavy loads have many wheels. (1mk)

 d) Liquids are preferred to gases for use in hydraulic machines (1mk)

5) State the effect on pressure when:

 a) Both force and area are increased three fold. (1mk)

 b) Area of contact is increased while force is kept constant. (1mk)

 c) Area is unchanged while force is reduced. (1mk)

6) State the factors influencing the pressure exerted by a liquid column. (3mks)

7) State the principle of transmission of pressure in liquids. (1mk)

8) A rectangular glass block of mass 6kg measures 20cm by 10cm by 6cm. Calculate:

 a) Maximum pressure it can exert on a flat surface. (4mks)

 b) Least pressure it can exert on a flat surface (3mks)

9) Calculate the pressure on a diver who is 3000cm below the surface of water in the sea if the density of sea water is 1150kg/m3. (Take g= 10N/kg) (3mks)

10) The cross-sectional area of the small piston of a hydraulic press used to compress a bale of hay is 5cm2 and that of the large piston is 80cm2. Given that a force of 100N is applied to the small piston, calculate:

 a) The pressure on the small piston. (2mks)

 b) The pressure on the large piston. (1mk)

 c) The force produced on the large piston compressing the bale. (2nks)

11) In the figure below, the liquid of density **ρ** rises to height, **h**. If the cross-sectional area is, **A** and the gravitational field strength is, **g**; Show that pressure **P** due to the liquid column is given by **P = hρg** (5mks)

 Height, h

 Area, A

12) Explain why wading birds have webbed feet. (1mk)