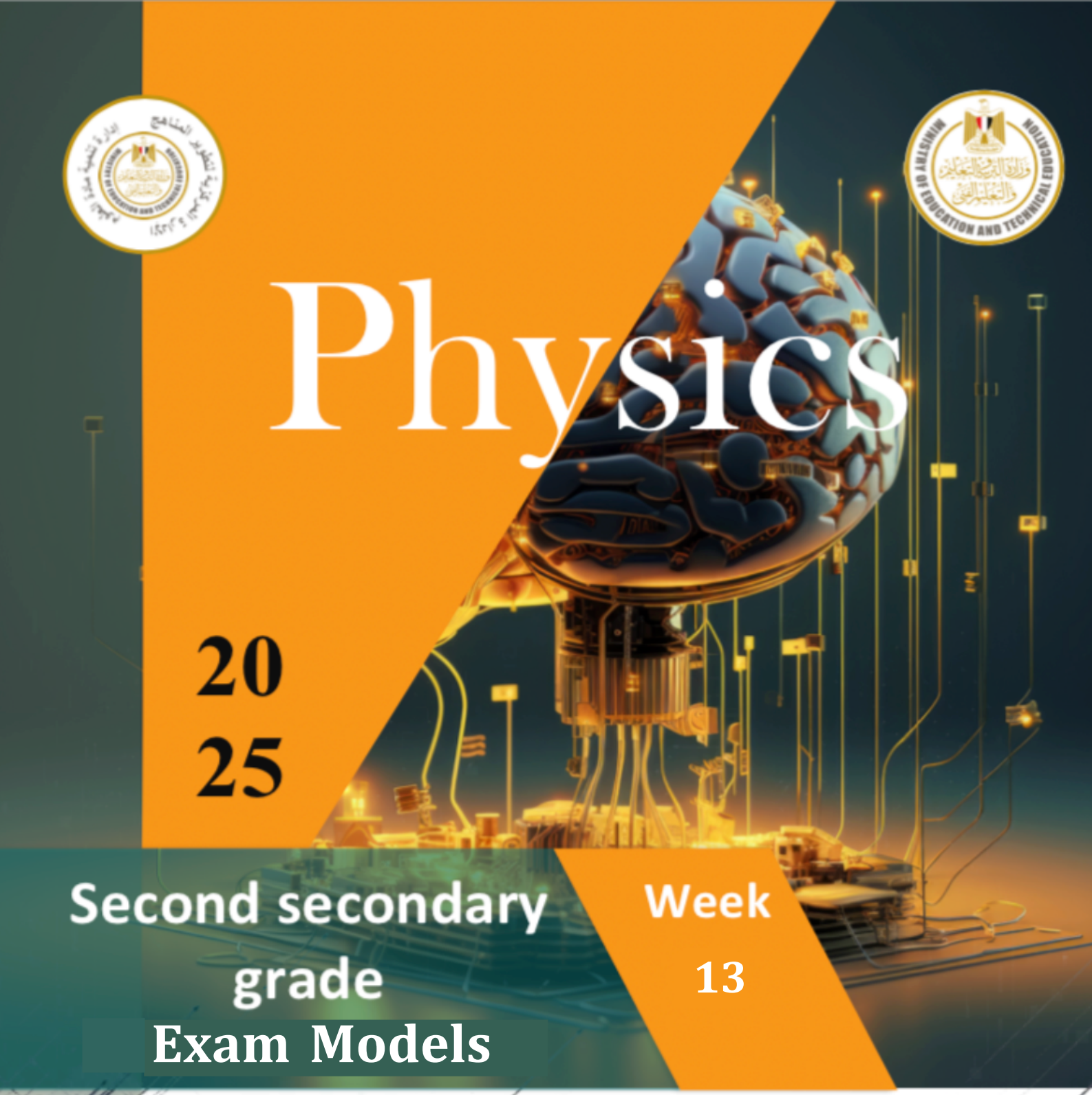
Physics



2025

Second secondary grade

Exam Models

Week 13

Prepare and review

Science Development Office

Exam (1)

® Multiple Choice Questions

1) A volume of liquid V liters is contained in a container. A piston applies a pressure P to the upper surface of the liquid. If the pressure of the piston on the surface of the liquid is doubled and its temperature does not change, then the volume will be ..... liters.

(A) 1/4V

(B) 1/2V

(C) V

(D) 2V

2) A container is completely filled when 5 kg of water is placed inside it. The same container will be completely filled if ..... kg of a liquid with a relative density of 0.8 is placed inside it, assuming the liquid has the same temperature as the water.

(A) 8Kg

(B) 5Kg

(C) 4Kg

(D) 3Kg

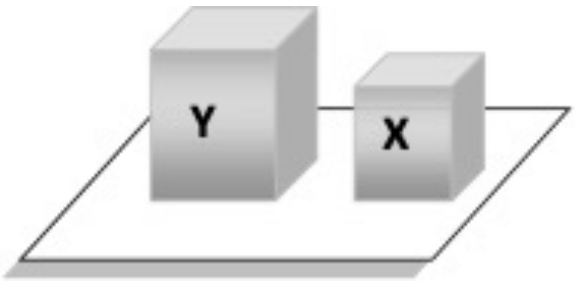
3) A cube X with a side length of L meters and a cube Y with a side length of 3L meters, made of different materials with the same mass. They are placed side by side on a horizontal surface as shown in the figure. The ratio of the pressure on the surface is....

(A) $P_X/P_Y = 1/3$

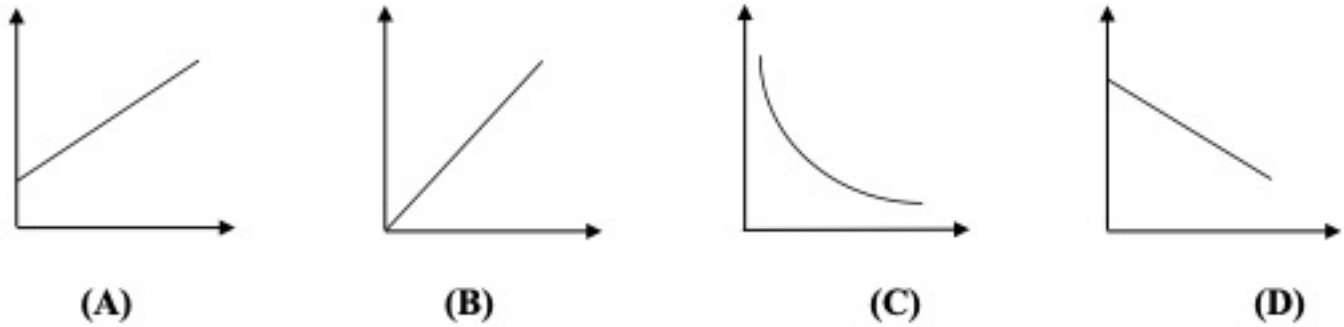
(B) $P_X/P_Y = 3/1$

(C) $P_X/P_Y = 1/6$

(D) $P_X/P_Y = 9/1$



4) The graph that represents the relation between the pressure of a fixed volume of gas (Vertical axis) and its temperature on the Kelvin scale (horizontal axis)



(A) (B) (C) (D)

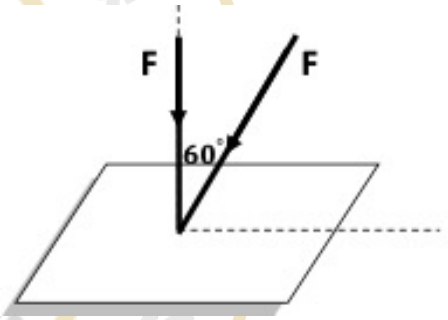
5) The figure shows a horizontal surface with an area of A, on which two equal forces of magnitude F are acting one force is perpendicular, and the other is inclined. The angle between the two forces is 60°. The pressure of the two forces on the surface is ....

(A) P = F/A

(B) P = 2F/A

(C) P = 3F/2A

(D) P = 2F/3A



6) A submarine at the bottom of the sea has an internal pressure equal to atmospheric pressure. If the atmospheric pressure at the surface of the sea is 10^5 Pascal and the pressure of the water on the submarine is 2×10^5 Pascal, Then the force acting on an area of 100 cm^2 of the submarine's outer surface is ……

(A) 1000 N

(B) 3000 N

(C) 2000 N

(D) 3 x 10^5 N

7) A hydraulic press has a mechanical advantage of 400/9. Then the ratio of the diameters of the large piston to the small piston of this press = ……

(A) 400/9

(B) 400/6

(C) 20/6

(D) 20/3

8) Consider 2 litres of oxygen gas and 4 litres of carbon dioxide gas, each at 0°C. The temperature of each gas is increased by 30 °C while keeping the pressure constant. Then the volume expansion coefficient of carbon dioxide gas is ..... the volume expansion coefficient of oxygen gas.

(A) Four times

(B) Twice

(C) Half

(D) Equal to

9) In a health test for college admission, the blood pressure of four students (Ashraf, Ayman, Raji, Rami) was measured. The values of their contraction pressure were (10, 11, 13, 14) cmHg, respectively. The nearest right value to the contraction pressure of a healthy person is in case of .....

(A) Ayman, Raji

(B) Ashraf, Ayman

(C) Ashraf, Raji

(D) Ayman, Ram

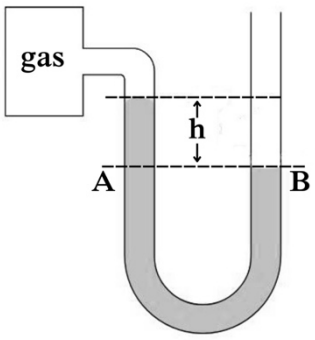
10) The figure shows a water manometer is connected to a gas reservoir. If the atmospheric pressure at the time of measuring the gas pressure is 76 cm Hg and the value of (h) shown in the diagram is 6.8 cm, So the pressure of the gas inside the reservoir is ..... (Where; The relative density of mercury is 13.6)

(A) 69.2 cm Hg

(B) 75.5 cm Hg

(C) 76 cm Hg

(D) 82.8 cm Hg



11) A cylindrical container with a height of 60 cm was filled to the edge with water (its density is 1000 kg/m^3). If the acceleration due to gravity is 10 m/s^2, So the pressure of the water will be 5000 N/m^2 at a point.....

(A) at the bottom of the container

(B) under water surface by 10 cm

(C) at the height of 50cm from the bottom of the container

(D) at the height of 10cm from the bottom of the container

12) A mercury barometer with a tube its length (1m), was placed at the bottom of a mountain, So the length of Torricellian vacuum was measured to be (h_1). When the barometer was moved to the mountaintop, the Torricellian vacuum length became (h_2). If the barometer is positioned exactly at the half of the height of the mountain, then the length of the Torricellian vacuum will be .....

(A) Less than (h_1) and less than (h_2)

(B) Greater than (h_1) and less than (h_2)

(C) Less than (h_1) and greater than (h_2)

(D) Greater than (h_1) and greater than (h_2)

13) A certain amount of gas in a container of constant volume, when the temperature of the gas changed by 300 Kelvin, its pressure increased to four times its value. Then the change in the temperature of the gas is .....

(A) From 100 K to 400 K

(B) From 400 K to 100 K

(C) From 200 K to 500 K

(D) From 300 K to 600 K

14) An equilibrium hydraulic press has a small piston of area (a) and a big piston of area (A). If the pressure applied to the small piston is doubled and the press remains in an equilibrium state, then .....

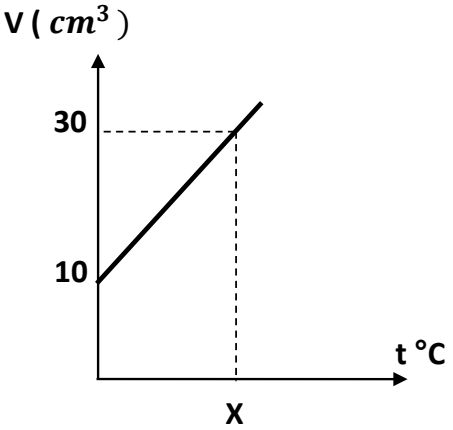
(A) The pressure on the big piston remains unchanged, and the mechanical advantage remains unchanged.

(B) The pressure on the big piston doubles, and the mechanical advantage doubles.

(C) The pressure on the big piston doubles, and the mechanical advantage remains unchanged.

(D) The pressure on the big piston decreases to half, and the mechanical advantage doubles.

15) The opposite graph shows the relation between the volume of a fixed amount of gas and its temperature at a constant pressure (according to Charles's Law). From the values shown on the graph, the value of (X) is .....



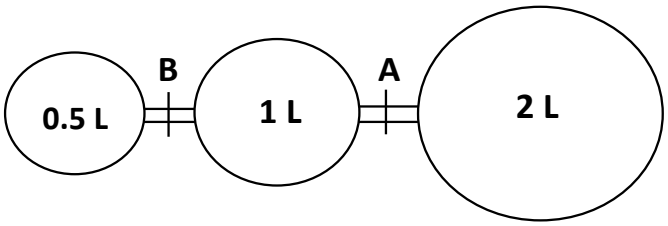
(A) 273 °C

(B) 456 °C

(C) 546 °C

(D) 819 °C

16) The figure shows three glass bulbs with constant temperatures and volumes of 2 Liter, 1 Liter, and 0.5 Liter, as shown in the diagram. A short tube with a valve is connected between each bulb. The middle bulb contains gas its pressure is 3 atm, while the other two bulbs are completely evacuated. The pressure inside the middle bulb decreases by one-third when .....



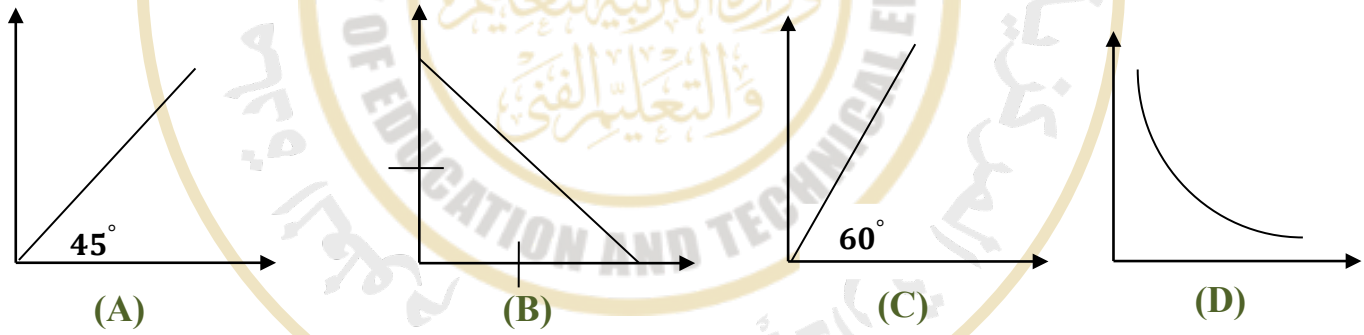
(A) Opening valve A only

(B) Opening valve B only

(C) Opening both valves together

(D) Replacing the right bulb with one of 4 L

17) The opposite graph that expresses the relation between the work done on the small piston (horizontal axis) and the work produced by the movement of the big piston (Vertical axis) for an ideal hydraulic piston (when the two quantities are plotted in the dame scale) is .....



18) The reading of a mercury barometer is 75 cm Hg at the bottom of a building. When it is carried to the highest point in the building, its reading changes by 25 Torr. the barometer reading at the highest point in the building is .....

(A) 100 cm Hg

(B) 77.5 cm Hg

(C) 72.5 cm Hg

(D) 50 cm Hg

19) A U-shaped tube with two arms of a cross-sectional area of A and 2A contains an amount of water. When kerosene with a relative density of 0.7 is added to the wide arm and the two liquids are balanced, the volume of water that has lowered from the wide arm is V (cm^3). The volume of water that is displaced into the narrow arm is……. (cm^3).

(A) 0.5 V

(B) V

(C) 2V

(D) 3V

20) A gas with a volume of V (liters) and a pressure of P (cmHg) at a temperature of T (Kelvin) is heated to a new temperature. If the volume became (3/2) V (liters) and the pressure became 2P (cm Hg). Then the new temperature of the gas in Kelvin is…….

(A) 2T/3

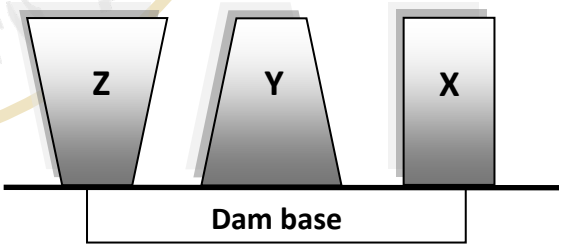
(B) T

(C) 2T

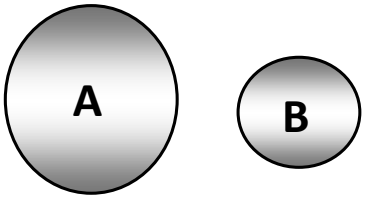
(D) 3T

© Essay Questions

21) From a physical standpoint, when designing a dam for deep water, which orientation (X, Y, or Z) is most preferable? Explain your reasoning.



22) The figure represents an air bubble at the bottom of a lake with a constant temperature when it rises and becomes just below the surface of the water - which of the two figures expresses the volume of the bubble at the surface - with an explanation?



23) **A vertical U-tube with two arms of uniform cross-section contains a quantity of water with density ρ, placed in one of the arms amount of oil with a relative density of (0.8). When the liquids are balanced, it is found that the heights of the water and oil above the separating surface are h_1 and h_2, respectively, with a difference of 3 cm between the two heights. Determine the heights h_1 and h_2 of the water and oil above the separating surface.**