# HOLIDAY HOME WORK – 2017
## CLASS: A. S. LEVEL.

## MATHEMATICS

Book--Pure mathematics (Sophie Goldie)
Exercise 1(A)—2 (ii,IV),3 (IV,v), 4 (I), 6(iii) 7( IV,v) 8 (IV,v) 9(v) 11(IV,v)
Exercise 1 (B)--1(viii,ix,x,xi),3,7
Exercise 1 (C)--5,7,10,12,14
Exercise 1 (D)--1(v,ix), 2(vi,xi) 6(v),8(vii)12

## CHEMISTRY

a.) Write the definition of mole no.
b.) What is stoichiometry
c.) Write general formula alcohol and acid

## PHYSICS:

Exercise on the chapter Uniform motion including numerical to be done.

**Additional problems are given for practice:**

1 In which of the following examples of motion, can the body be considered approximately a point object:
(a) a railway carriage moving without jerks between two stations.
(b) a monkey sitting on top of a man cycling smoothly on a circular track.
(c) a spinning cricket ball that turns sharply on hitting the ground.
(d) a tumbling beaker that has slipped off the edge of a table.

2 The position-time (*x*-*t*) graphs for two children A and B returning from their school O to their homes P and Q respectively are shown in Fig. 19. Choose the correct entries in the brackets below ;
(a) (A/B) lives closer to the school than (B/A)
(b) (A/B) starts from the school earlier than (B/A)
(c) (A/B) walks faster than (B/A)
(d) A and B reach home at the (same/different) time
(e) (A/B) overtakes (B/A) on the road (once/twice).

3 A woman starts from her home at 9.00 am, walks with a speed of 5 km h–1 on a straight road up to her office 2.5 km away, stays at the office up to 5.00 pm, and returns home by an auto with a speed of 25 km h–1. Choose suitable scales and plot the *x*-*t* graph of her motion.

4 A drunkard walking in a narrow lane takes 5 steps forward and 3 steps backward, followed again by 5 steps forward and 3 steps backward, and so on. Each step is 1 m long and requires 1 s. Plot the *x*-*t* graph of his motion. Determine graphically and otherwise how long the drunkard takes to fall in a pit 13 m away from the start.

5 A jet airplane travelling at the speed of 500 km h–1 ejects its products of combustion at the speed of 1500 km h–1 relative to the jet plane. What is the speed of the latter with respect to an observer on the ground ?

6 A car moving along a straight highway with speed of 126 km h–1 is brought to a stop within a distance of 200 m. What is the retardation of the car (assumed uniform), and how long does it take for the car to stop ?

7 Two trains A and B of length 400 m each are moving on two parallel tracks with a uniform speed of 72 km h–1 in the same direction, with A ahead of B. The driver of B decides to overtake A and accelerates by 1 m s–2. If after 50 s, the guard of B just

brushes past the driver of A, what was the original distance between them ?

**8** On a two-lane road, car A is travelling with a speed of 36 km h–1. Two cars B and C approach car A in opposite directions with a speed of 54 km h–1 each. At a certain instant, when the distance AB is equal to AC, both being 1 km, B decides to overtake A before C does. What minimum acceleration of car B is required to avoid an accident ?

**9** Two towns A and B are connected by a regular bus service with a bus leaving in either direction every $T$ minutes. A man cycling with a speed of 20 km h–1 in the direction A to B notices that a bus goes past him every 18 min in the direction of his motion, and every 6 min in the opposite direction. What is the period $T$ of the bus service and with what speed (assumed constant) do the buses ply on the road?

**10** A player throws a ball upwards with an initial speed of 29.4 m s–1.
(a) What is the direction of acceleration during the upward motion of the ball ?
(b) What are the velocity and acceleration of the ball at the highest point of its motion ?
(c) Choose the $x$ = 0 m and $t$ = 0 s to be the location and time of the ball at its highest point, vertically downward direction to be the positive direction of $x$-axis, and give the signs of position, velocity and acceleration of the ball during its upward, and downward motion.
(d) To what height does the ball rise and after how long does the ball return to the player's hands ? (Take $g$ = 9.8 m s–2 and neglect air resistance).

**11** Read each statement below carefully and state with reasons and examples, if it is true or false ;
A particle in one-dimensional motion
(a) with zero speed at an instant may have non-zero acceleration at that instant
(b) with zero speed may have non-zero velocity,
(c) with constant speed must have zero acceleration,
(d) with positive value of acceleration *must* be speeding up.

**12** A ball is dropped from a height of 90 m on a floor. At each collision with the floor, the ball loses one tenth of its speed. Plot the speed-time graph of its motion between $t$ = 0 to 12 s.

**13** Explain clearly, with examples, the distinction between :
(a) magnitude of displacement (sometimes called distance) over an interval of time, and the total length of path covered by a particle over the same interval;
(b) magnitude of average velocity over an interval of time, and the average speed over the same interval. [Average speed of a particle over an interval of time is defined as the total path length divided by the time interval]. Show in both (a) and (b) that the second quantity is either greater than or equal to the first. When is the equality sign true ? [For simplicity, consider one-dimensional motion only].

**14** A man walks on a straight road from his home to a market 2.5 km away with a speed of 5 km h–1. Finding the market closed, he instantly turns and walks back home with a speed of 7.5 km h–1. What is the(a) magnitude of average velocity, and (b) average speed of the man over the interval of time (i) 0 to 30 min, (ii) 0 to 50 min, (iii) 0 to 40 min ? [Note: You will appreciate from this exercise why it is better to define average speed as total path length divided by time, and not as magnitude of average velocity. You would not like to tell the tired man on his return home that his average speed was zero !]

**15** In Exercises 13 and 14, we have carefully distinguished between *average* speed and magnitude of *average* velocity. No such distinction is necessary when we consider instantaneous speed and magnitude of velocity. The instantaneous speed is always equal to the magnitude of instantaneous velocity. Why ?

********************