

**DAY:1**

**SESSION:2**

**ESTABLISHING ENTRY LEVEL BEHAVIOUR-TAKE THE TEST-5 TEST ITEMS**

**(PISA – PRETEST- SCIENCE- QUESTIONS SET-1)**

**Q.I -FLU ACOL VOLUNTARY FLU IMMUNISATION PROGRAM**

As you are no doubt aware the flu can strike rapidly and extensively during winter. It can leave its victims ill for weeks. The best way to fight the virus is to have a fit and healthy body. Daily exercise and a diet including plenty of fruit and vegetables are highly recommended to assist the immune system to fight this invading virus. ACOL has decided to offer staff the opportunity to be immunised against the flu as an additional way to prevent this insidious virus from spreading amongst us. ACOL has arranged for a nurse to administer the immunizations at ACOL, during a half-day session in work hours in the week of May 17. This program is free and available to all members of staff. Participation is voluntary. Staff taking up the option will be asked to sign a consent form indicating that they do not have any allergies, and that they understand they may experience minor side effects. Medical advice indicates that the immunisation does not produce influenza. However, it may cause some side effects such as fatigue, mild fever and tenderness of the arm.

Who should be immunised?

Anyone interested in being protected against the virus. This immunisation is especially recommended for people over the age of 65. But regardless of age, ANYONE who has a chronic debilitating disease, especially cardiac, pulmonary, bronchial or diabetic conditions. In an office environment ALL staff are at risk of catching the flu.

Who should not be immunised? Individuals hypersensitive to eggs, people suffering from an acute feverish illness and pregnant women.

QUESTION 1.1 Which one of the following describes a feature of the ACOL flu immunisation program?



- A. Daily exercise classes will be run during the winter.
- B. Immunizations will be given during working hours.
- C. A small bonus will be offered to participants.

D. A doctor will give the injections.

QUESTION 1.2 We can talk about the content of a piece of writing (what it says). We can talk about its style (the way it is presented). Fiona wanted the style of this information sheet to be friendly and encouraging. Do you think she succeeded?

Explain your answer by referring in detail to the layout, style of writing, pictures or other graphics.

### QUESTION 1.3

This information sheet suggests that if you want to protect yourself against the flu virus, a flu injection is -

- A. more effective than exercise and a healthy diet, but more risky.
- B. a good idea, but not a substitute for exercise and a healthy diet.
- C. as effective as exercise and a healthy diet, and less troublesome.
- D. not worth considering if you have plenty of exercise and a healthy diet.

QUESTION 1.4 Part of the information sheet says: Who should be immunised?

Anyone interested in being protected against the virus. After Fiona had circulated the information sheet, a colleague told her that she should have left out the words “Anyone interested in being protected against the virus” because they were misleading. Do you agree that these words are misleading and should have been left out? Explain your answer.

## Q. 2 -Scientific Police Weapons

### **We are made up of billions of cells**

Every living thing is made up of lots of cells. A cell is very small indeed. It can also be said to be microscopic because it can only be seen using a microscope which magnifies it many times.

Each cell has an outer membrane and a nucleus in which the DNA is found.

### **Genetic what?**

DNA is made up of a number of genes, each consisting of thousands of “pearls”. Together these genes form the genetic identity card of a person.

### **How is the genetic identity card revealed?**

The geneticist takes the few cells from the base of the hairs found on the victim, or from the saliva left on a cigarette end. He puts them into a product which destroys everything around the DNA of the cells. He then does the same thing with some cells from the suspect’s blood. The DNA is then specially prepared for analysis. After this, it is placed in a special gel and an

electric current is passed through the gel. After a few hours, this produces stripes similar to a bar code (like the ones on things we buy) which are visible under a special lamp. The bar code of the suspect's DNA is then compared with that of the hairs found on the victim.



*Microscope in a police laboratory*

Evidence obtained from a crime scene -

At the crime scene, investigators have gathered every possible shred of evidence imaginable: fibres from fabrics, hairs, finger marks, cigarette ends...The few hairs found on the victim's jacket are red. And they look strangely like the suspect's. If it could be proved that these hairs are indeed his, this would be evidence that he had in fact met the victim. Every individual is unique. Specialists set to work. They examine some cells at the root of these hairs and some of the suspect's blood cells. In the nucleus of each cell in our bodies there is DNA.

What is it?

DNA is like a necklace made of two twisted strings of pearls. Imagine that these pearls come in four different colours and that thousands of coloured pearls (which make up a gene) are strung in a very specific order. In each individual this order is exactly the same in all the cells in the body: those of the hair roots as well as those of the big toe, those of the liver and those of the stomach or blood. But the order of the pearls varies from one person to another. Given the number of pearls strung in this way, there is very little chance of two people having the same DNA, with the exception of identical twins.

**2.1A** To explain the structure of DNA, the author talks about a pearl necklace.

How do these pearl necklaces vary from one individual to another?

- A. They vary in length.
- B. The order of the pearls is different.
- C. The number of necklaces is different.
- D. The colour of the pearls is different.

**2.1 B** What is the purpose of the box headed "How is the genetic identity card revealed"? To explain

- A. What DNA is.

- B. What a bar code is.
- C. how cells are analysed to find the pattern of DNA.
- D. how it can be proved that a crime has been committed

**2.1 C** What is the author's main aim?

- A. To warn
- B. To amuse.
- C. To inform.
- D. To convince.

**2.1 D** The end of the introduction (the first shaded section) says: "But how to prove it?"

According to the passage, investigators try to find an answer to this question by

- A. interrogating witnesses.
- B. carrying out genetic analyses.
- C. interrogating the suspect thoroughly.
- D. going over all the results of the investigation

### **Q.3. The Grand Canyon**

The Grand Canyon is located in a desert in the USA. It is a very large and deep canyon containing many layers of rock. Sometime in the past, movements in the Earth's crust lifted these layers up. The Grand Canyon is now 1.6 km deep in parts. The Colorado River runs through the bottom of the canyon. See the picture below of the Grand Canyon taken from south rim. Several different layers of rock can be seen in the walls of the canyon.



About five million people visit the Grand Canyon national park every year. There is concern about the damage that is being caused to the park by so many visitors.

**3.1 A.** Can the following questions be answered by scientific investigation?

Circle 'Yes' or 'No' for each question.

Can this question be answered by scientific investigation?	Yes/No
How much erosion is caused by use of the walking tracks?	Yes /No
Is the park area as beautiful as it was 100 years ago?	Yes/No

**3.1 B** The temperature in the Grand Canyon ranges from below 0 oC to over 40 oC. Although it is a desert area, cracks in the rocks sometimes contain water. How do these temperature changes and the water in rock cracks help to speed up the breakdown of rocks?

- A) Freezing water dissolves warm rocks.
- B) Water cements rocks together.
- C) Ice smooths the surface of rocks.
- D) Freezing water expands in the rock cracks.

**3.1 C** There are many fossils of marine animals, such as clams, fish and corals, in the Limestone A layer of the Grand Canyon. What happened millions of years ago that explains why such fossils are found there?

- A. In ancient times, people brought seafood to the area from the ocean.
- B. Oceans were once much rougher and sea life washed inland on giant waves.
- C. An ocean covered this area at that time and then receded later.
- D. Some sea animals once lived on land before migrating to the sea.

#### **Q.4. SCIENCE PASSAGE ACID RAIN**

Acid Rain Below is a photo of statues called Caryatids that were built on the Acropolis in Athens more than 2500 years ago. The statues are made of a type of rock called marble. Marble is composed of calcium carbonate. In 1980, the original statues were transferred inside the museum of the Acropolis and were replaced by replicas. The original statues were being eaten away by acid rain.



**Acid Rain**

**Q.4.1.** Normal rain is slightly acidic because it has absorbed some carbon dioxide from the air. Acid rain is more acidic than normal rain because it has absorbed gases like sulfur oxides and nitrogen oxides as well.

a) Where do these sulphur oxides and nitrogen oxides in the air come from?

b) Gives any one of car exhausts, factory emissions, burning fossil fuels, or similar, or just refers to pollution.

**Q. 4.2.** The effect of acid rain on marble can be modelled by placing chips of marble in vinegar overnight. Vinegar and acid rain have about the same acidity level. When a marble chip is placed in vinegar, bubbles of gas form. The mass of the dry marble chip can be found before and after the experiment.

A marble chip has a mass of 2.0 grams before being immersed in vinegar overnight. The chip is removed and dried the next day. What will the mass of the dried marble chip be?

A Less than 2.0 grams

B Exactly 2.0 grams

C Between 2.0 and 2.4 grams

D More than 2.4 grams

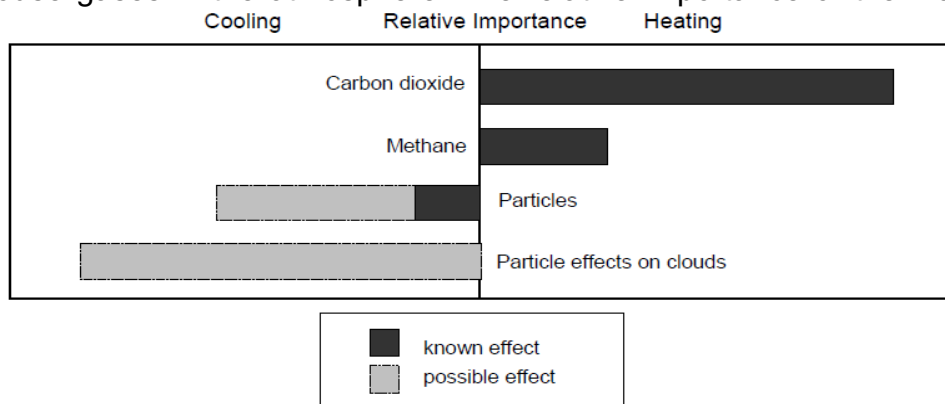
**Q.4.3.** Students who did this experiment also placed marble chips in pure (distilled) water overnight. Explain why the students include this step in their experiment.

## Q.5 Climate Change

Read the following information and answer the questions which follow.

### WHAT HUMAN ACTIVITIES CONTRIBUTE TO CLIMATE CHANGE?

The burning of coal, oil and natural gas, as well as deforestation and various agricultural and industrial practices, are altering the composition of the atmosphere and contributing to climate change. These human activities have led to increased concentrations of particles and greenhouse gases in the atmosphere. The relative importance of the main contributors to



temperature change is shown in Figure 1.

Increased concentrations of carbon dioxide and methane have a heating effect. Increased concentrations of particles have a cooling effect in two ways, labelled 'Particles' and 'Particle effects on clouds'.

**Figure 1: Relative importance of the main contributors to change in temperature of the atmosphere.**

Bars extending to the right of the centre line indicate a heating effect. Bars extending to the left of the centre line indicate a cooling effect. The relative effect of 'Particles' and 'Particle effects on clouds' are quite uncertain: in each case the possible effect is somewhere in the range shown by the light grey bar.

Q.5.1: CLIMATE CHANGE Use the information in Figure 1 to develop an argument in support of reducing the emission of carbon dioxide from the human activities mentioned.

.....

.....

.....