INTEGRATED SCIENCE PAPER 2

Total: 30 Marks

Task 1: To observe and distinguish between temporary physical changes and chemical changes using candle wax or ice cubes, copper(II) sulphate and cobalt(II) chloride.

Materials provided:

- Candle and matches
- Ice cubes in a dish
- Copper (II) sulphate crystals (blue)
- Cobalt (II) chloride crystals or paper (blue)
- Heat source (spirit lamp or Bunsen burner)
- Test tubes and holders
- Petri dishes
- Dropper with water

Instruction: Perform and observe the following experiments and answer each question. (15 marks per experiment)

1. Heat ice cubes or wax in a dish. (3 mark)
   a) What do you observe?
   b) State whether the change is physical or chemical.
   c) Is the change temporary or permanent?
2. After heating, cool the substance in the dish. (2 mark)
   a) What happens to the heated substances in 1 above when cooled?
   b) Can the original ice cube or wax be recovered?
3. What safety measures did you observe during the heating and cooling of substances? (3 mark)
4. Observe how copper(II) sulphate crystals or cobalt(II) chloride crystals react with water.
   a) Add a few drops of water to the dry blue copper(II) sulphate crystals.
   i) What do you observe in terms of change in colour or texture? (1 mark)
   ii) Is the change temporary physical or chemical? (1 mark)
   iii) Can the original crystal form again after drying? (1 mark)
   b) Add water to dry cobalt (II) chloride crystals.
   i) What colour does cobalt (II) chloride crystals change to when drops of water are added? (1 mark)
   ii) What does this tell you about moisture? (1 mark)
   iii) Is this a temporary or permanent chemical change? (1 mark)
   c) Which crystals changed colour temporarily when water was added? (1 mark)

Task 2 Observing a plant cell under a light microscope (15 marks)

Materials needed

- A light microscope
- Microscope slide and coverslip
- Forceps
- Dropper
- Iodine solution (or methylene blue)
- Onion epidermis or leaf peel
- Tissue paper