

# Year End Examination 2015 Science I

## විද්‍යාව I

Grade 11

Time: 1 hour

Name/ Index No.

• Answer all questions.

01. A student found an organism with following characteristic features.

- A - unsegmented soft moist body.                      B - Covered with a shell.  
C - have a muscular foot.

To which group this organism belongs to,

- (1) Annelids                      (2) Mollusks                      (3) Arthropods                      (4) Coelenterate

02. Select the wrong statement about the muscle cells given below.



- (1) Striated and not spindle shape muscle cells.  
(2) branched and uni nucleated muscle cells.  
(3) found only in the heart.  
(4) A muscle cell which is controlled voluntary

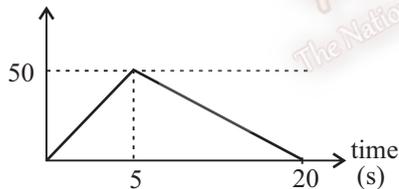
03. What is the factor that increase the transpiration ?

- (1) Increase of atmospheric humidity.                      (2) Decrease of light intensity.  
(3) Increase of soil water concentration.                      (4) Decrease of atmospheric temperature.

04. The wall of the heart that is thickest of all.

- (1) Left auricular wall.                      (2) Left ventricular wall.  
(3) Right auricular wall.                      (4) Right ventricular wall.

05. Find the false statement about the given graph.

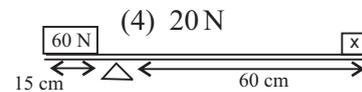
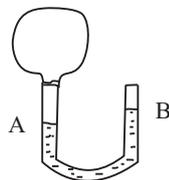


- (1) The displacement of the object is 50 m  
(2) The distance travelled by the object is 100 m  
(3) The time taken for complete the motion is 20 s.  
(4) The average speed of the object is  $4 \text{ ms}^{-1}$

06. Two objects are placed on the beam as shown below. Find the weight of X to keep the beam balanced.

- (1) 60 N                      (2) 15 N                      (3) 30 N                      (4) 20 N

07. As shown in the diagram



A balloon was fixed to the arm "A" of a u tube which is filled with water. Suddenly the balloon got blast. What is the observation you could observe from the followings.

- (1) Water level will be seen as in the diagram without any change.  
(2) Water level in A arm decreases.  
(3) Water level in both arms get equal.  
(4) Water level in both arms increases.

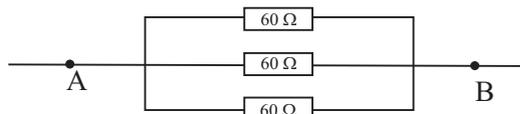
08. The Kinetic energy stored in a moving object of 8 kg was 36 J. Find the velocity of the object.

- (1)  $3 \text{ ms}^{-1}$                       (2)  $8 \text{ ms}^{-1}$                       (3)  $4 \text{ ms}^{-1}$                       (4)  $2 \text{ ms}^{-1}$

09. Radiation is one method of heat transmission. Select the **false** statement about the Radiation,
- (1) Radiation does not require a material medium to transfer heat.
  - (2) Any warm object do radiation.
  - (3) Rate of radiation is less in dull black surfaces.
  - (4) In radiation heat is transferred through waves.

10. Select the correct statement about the factors affecting the capacity of a capacitor.
- (1) Area of the plates affects the capacity of a capacitor.
  - (2) The distance between the two plates affects the capacity of the capacitor.
  - (3) Nature of the dielectric substance affects the capacity of the capacitor.
  - (4) All of the above factors affects the capacity of the capacitor.

11. Find the total resistance of the three resistors given below.



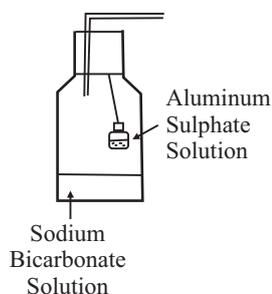
- (1)  $20\ \Omega$
  - (2)  $30\ \Omega$
  - (3)  $15\ \Omega$
  - (4)  $180\ \Omega$
12. Diagrams A, B, C and D show two neutral atoms and two ions.
- A

B

C

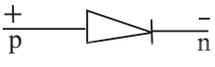
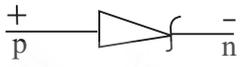
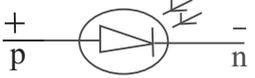
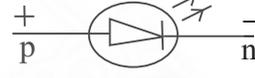
D
- Select the pair of neutral atoms.
- (1) B and C
  - (2) A and D
  - (3) D and C
  - (4) A and B
13. Valency of element A is 5. What is the formula of its' oxide ?
- (1)  $XO_5$
  - (2)  $X_5O$
  - (3)  $X_2O_5$
  - (4)  $X_5O_2$
14. Select the answer which contains the metals only can be extracted using the method of electrolysis of fused chlorides.
- (1) Mg, Na, K
  - (2) Na, Ag, Ca
  - (3) Fe, Ca, Mg
  - (4) Au, Ag, Mg
15. A gas liberated from chemical experiment was collected by the method of upaward displacement of air as that gas was denser than the air. Collecting method of downward displacement of water could not apply because the gas was slightly soluble in water. More over it was found this gas is colourless, odourless and do not support the combustion. This gas could be,
- (1)  $O_2$
  - (2)  $H_2$
  - (3)  $NO_2$
  - (4)  $CO_2$

16.



The diagram shows a model of a fire extinguisher. Which type of fire is controlled successfully by this type fire extinguisher ?

- (1) fires caused by paper and fabric.
  - (2) fires caused by inflammable liquids oil and greases.
  - (3) fires caused by electrical equipment.
  - (4) fires caused by reactive metals such as sodium, potassium and magnesium.
17. An object produced a sound wave with a frequency of 600 Hz and its wave length was 0.5. Find the speed of the sound wave in air.
- (1)  $300\ ms^{-1}$
  - (2)  $600\ ms^{-1}$
  - (3)  $200\ ms^{-1}$
  - (4)  $150\ ms^{-1}$

18. Following statements are about the electromagnetic waves,  
 A- A medium is not necessary for the transmission.  
 B- Do not obey the laws of reflection and refraction.  
 C- They are uncharged.  
 Correct statements are,  
 (1) A and B (2) B and C (3) A and C (4) Above all
19. A water pond appears to be 6 m deep. If the refractive index of water is  $\frac{4}{3}$ , what is the real depth?  
 (1) 4 m (2) 3 m (3) 12 m (4) 8 m
20. Unit of measuring the electrical energy used in household circuits is,  
 (1) KWs (2) kWh (3) kW (4) kJh
21. Following statements are explaining about the magnetic field strength of an electromagnet.  
 A- Increase of the current flowing increases the magnetic field strength.  
 B- Increase of the number of turns in the coil decrease the magnetic field strength.  
 D- Increase of the soft iron core increases the magnetic field strength.  
 D- Magnetic field strength can not be changed by changing any factor.  
 True statements are,  
 (1) A and B (2) B and C (3) A and C (4) B and D
22. Correct symbol of Photo diode is,  
 (1)  (2)   
 (3)  (4) 
23. Select the organic Polar solvent,  
 (1) Liquid ammonia (2) Ethanol  
 (3) Benzene (4) Water
24. A given metal does not react with cold water and when it burns in air it gave a bright white flame. After the combustion a white powder was found. This metal could be,  
 (1) Mg (2) Al (3) Zn (4) Fe
25. Few types of rocks that could be found in Sri Lanka is given below.  
 a Granite b Graphite c Marble  
 Out of above, which rock / rocks contain the minerals of quartz and feldspar,  
 (1) a only (2) a and b (3) b and c (4) a, b and c
26. Select environmental factor that should not be present in an area where a saltern is going to be established?  
 (1) Minimum rain fall throughout the year.  
 (2) a sandy soil with high mineral concentration.  
 (3) Availability of strong sunlight throughout the year.  
 (4) Must be a low flat land.
27. Select the wrong statement about the Ozone layer.  
 (1) Ozone layer act as a protective cover which keeps off ultra violet rays from reaching the earth.  
 (2) Oxides of Nitrogen and halogenated hydrocarbons help in depletion of the Ozone layer.  
 (3) Gases which enhance the depletion of ozone layer may contain in refrigerators and air conditioners.  
 (4) Natural environmental changes is a major cause of ozone depletion today more than human activities.
28. Select the response that gives an acid a base and a salt from followings.  
 (1) HCl, H<sub>2</sub>SO<sub>4</sub>, CuSO<sub>4</sub> (2) NaOH, NaHCO<sub>3</sub>, CuSO<sub>4</sub>  
 (3) H<sub>2</sub>SO<sub>4</sub>, NaOH, Cu(OH)<sub>2</sub> (4) HCl, Ca(OH)<sub>2</sub>, CuSO<sub>4</sub>
29. Consider the three reactions given below.  
 (A) CaCO<sub>3</sub> → CaO + CO<sub>2</sub> (B) Fe + S → FeS  
 (C) Zn + CuSO<sub>4</sub> → ZnSO<sub>4</sub> + Cu

What are the types of reactions given below, to which the reactions (A), (B) and (C) are examples respectively ?

- (1) combination, decomposition and single displacement.
- (2) decomposition, combination and double displacement.
- (3) decomposition, single displacement and combination.
- (4) decomposition, combination and single displacement.

30. There are some enzymes and functions of enzymes in the columns left and right respectively, but they are not in order,

- |   |            |    |   |
|---|------------|----|---|
| 1 | Insulin    | A. | Develop teh secondary sexual characteristics. |
| 2 | Thyroxin   | B  | Preparing the body for emergency situations.  |
| 3 | Adrenaline | C  | Controlling the metabolic rate of body.       |
| 4 | Oestrogen  | D  | Regulating the glucose level in blood.        |

Which one is the correct order when A,B,C and D are listed in accordance with 1, 2, 3 and 4

- (1) D, C, B, A
- (2) A, C, D, B
- (3) C, A, D, B
- (4) D, B, C, A

31. Who involve directly in recycling matter in the ecosystem are,

- (1) Primary consumers
- (2) Parasites
- (3) Decomposers
- (4) Primary producers

32. Theory of natural selection put forwarded by Dr. Charles Darwin explains the evolution of organism. Select the wrong statement about it.

- (1) Variations can be seen in a population.
- (2) There is a struggle for existence among organisms.
- (3) Variations has no connection with the evolution of organism.
- (4) more suitable variations will naturally selected by the environment.

33. What is the structure that could be found in plant cells but could not be found in animal cell ?

- (1) Cytoplasm
- (2) Nucleus
- (3) Central vacuole
- (4) Cell memberane

34. Transportation of water to the top of very tall trees is done by,

- (1) Transpiration pull
- (2) Osmosis
- (3) Root pressure
- (4) Diffusion.

35. More surface area, presence of thin moist memberane good amount of blood capitaries are special features of a certain organ. The function of this organ is,

- (1) Absorption
- (2) Exchange of gases
- (3) excretion
- (4) Sensitivity

36. Consider the following factors.

- A- Smoking and consuming alcohol.                      B - Mental stress  
C- Not taking food on time.

out of these, select the factors cause to occur gastritis.

- (1) only B and C
- (2) only A and C
- (3) AllA, B and C
- (4) only A and B

37. In early months of 2015 a fatal viral disease spread out around the African countries . That disease is,

- (1) Ebola
- (2) Denaue
- (3) Malaria
- (4) Sars

38. Water of a lake which was used to dispose domestic waste matter have been turn into dark green. Reason for this is ?

- (1) Due to being abundant of aquatic plants.
- (2) Due to water remains in it without flowing.
- (3) Due to the releasing of green colour water to it from industries.
- (4) Due to high growth of algae.

39. Select the correct scientific name of jungle fowl,

- (1) Gallus lafayetii
- (2) gallus lafayetii
- (3) Gallus Lafayettii
- (4) gallus Lafayettii

40. One of the world's main environmental issues we experience today is,

- (1) Acid rains
- (2) Global warming
- (3) Reduction of biodiversity
- (4) Depletion of ozone layer.

# Year End Examination 2015 Science II

## විද්‍යාව II

Grade 11

Time: 3 hours

Name/ Index No.

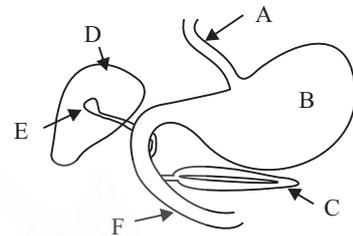
- Paper II Consists of two parts, A and B.
- Answer all four questions in part A in the space provided.
- Answer three questions from part B, selecting one question each from the sections, Biology, Chemistry and Physics.

### Part A - Structured Essay Questions.

01. A A diagram of a part of human digestive system is shown below.

(i) Name the parts from A to F.

- A - .....
- B - .....
- C - .....
- D - .....
- E - .....
- F - .....



(ii) Name two enzymes collected to the food at B.

- a. .... b. ....

(iii) Write 3 digestive enzymes secreted by gland C.

- a. .... b. .... c. ....

(iv) What is the name of the secretion stored in "E" and what is the function of it?

- a. ....
- b. ....

B. Cell is the main structural and functional unit of all organisms.

(i) Fill the table given below using your knowledge about organelles which present in the cell.

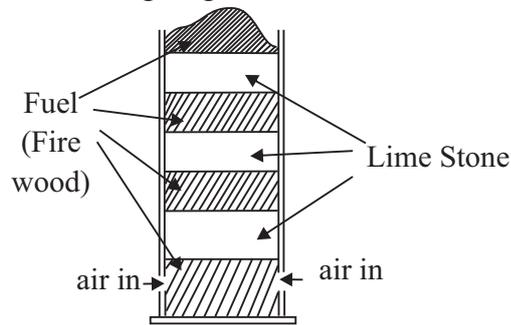
Organelle	Structure	Function
a. ....	b. ....	Photosynthesis
2 Golgibodies	c. ....	d. ....
e. ....	.....	f. ....
	.....	.....
	System of tubular network and surrounded by a membrane.	

(ii) The main function of xylem tissue is transportation of water. Name four types of cells found in Xylem tissue.

- a. .... c. ....
- b. .... d. ....

(iii) The movement of water and minerals from soil to the xylem of the root is called ..... and the water and minerals are transported through xylem by .....

02. A (i) Following diagram shows a traditional lime kiln used in Sri Lanka.



(i) Write the balanced equation to show the decomposition of calcium carbonate.

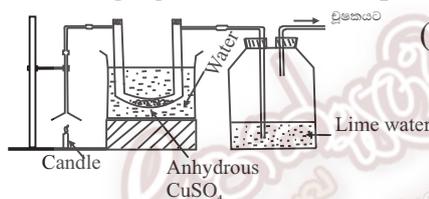
.....  
 .....  
 .....  
 .....

(ii) What is the main disadvantages in the traditional lime kiln ?

(iii) Write down two uses of the product that you get by the decomposition of calcium carbonate.

- a. ....  
 b. ....

B. Following figure shows a set-up that fixed to do an experiment by a student.



(i) To observe what this set-up is fixed for ?

.....  
 .....

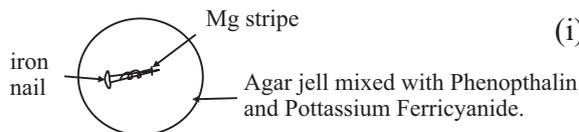
(ii) Give two expected observations of this experiment.

- a. ....  
 b. ....

(iii) What is the reason to use a water beaker here ?

.....

C.



(i) Name the anode.

.....  
 .....

(ii) Write the chemical equation take place at the anode.

.....

(iii) What is the colour change that take place at the my stripe.

.....

(iv) Name the cathode.

.....

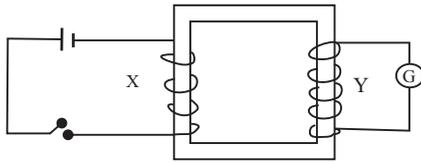
(v) Write the chemical equation that take place at the cathode.

.....

(vi) What is the colour change that take place near the head of the iron nail?

.....

03. X and Y are two coils wound around a soft iron core.



(i) What is the observation you can see in the galvanometer when the switch went on?

.....  
 .....

(ii) If you continuously keep the switch on what is the observation you may get in the galvanometer?

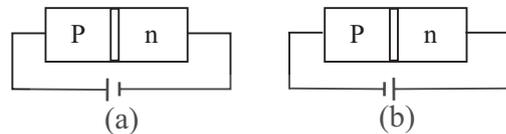
.....  
 .....

(iii) Number of turns in the x and y coils respectively are 20 and 500. 15 v of recurring voltage is supplied to the x coil. Find the out - put voltage of Y.

.....

B. (i) What is a p-n junction ?

.....



(i) Which circuit is in the condition of "forward biased" ?

.....

(ii) Give two uses of diodes.

a. ....

b. ....

C. (i) What is the unit that used to measure electrical energy used in household circuits?

.....

(ii) An electrical appliance of 100 W is used for 300 hours. Give this in units you above mentioned.

.....  
 .....

(iii) Name two components of house wiring circuit which protect the electrical appliances from the damages.

.....  
 .....

(iv) Give three safety precautions in using electricity.

.....  
 .....

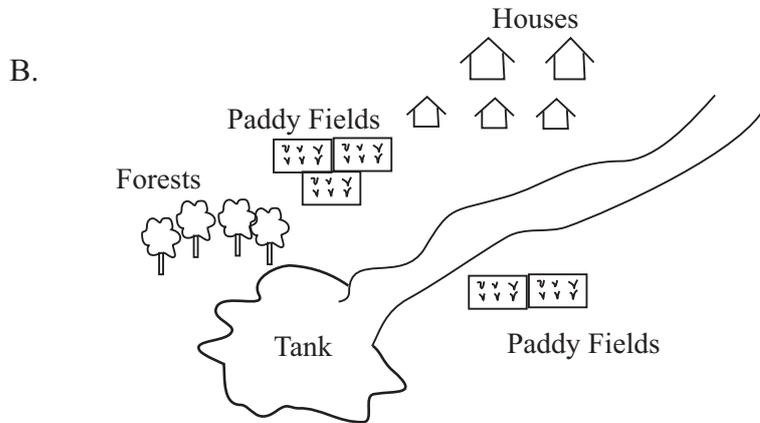
04. A. (i) What is the main substance which cause the increasement acidity of rain water ?

.....

(ii) Write a balanced chemical equation to show the dissolvment of above factor in rain water.

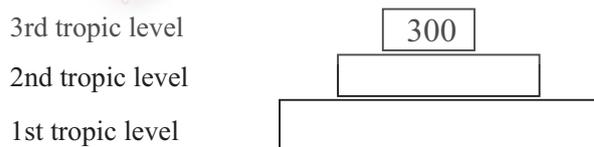
.....

- (iii) Name another substance which help in the increasement of acidity in rain water.  
.....
- (iv) Give two environmental impacts due to this.  
.....  
.....



- (i) According to the above picture name 2 ways of polluting the lake water.  
.....  
.....
- (ii) It was observe that the water of the lake have been turn into dark green colour. What are the ions which cause this change.  
.....
- (iii) Give two ill effects of this environmental change.
  - a. ....
  - b. ....

C. An energy pyramid of an echosystem is given below.



It was found that the amount of energy present in 3rd tropic level is 300 units.

- (i) Find the amount of energy present in 1st and 2nd tropic levels.
  - a. 1st level .....
  - b. 2nd level .....
- (ii) When going from one tropic level to another an energy loss could be observed. Give 2 ways of that energy loss.  
.....
- (iii) Name two other ecological pyramids which use to show the relationship between tropic levels.
  - a. ....
  - b. ....

# Year End Examination 2015 Science II - (continuation)

## විද්‍යාව II - ඉතිර කොටස

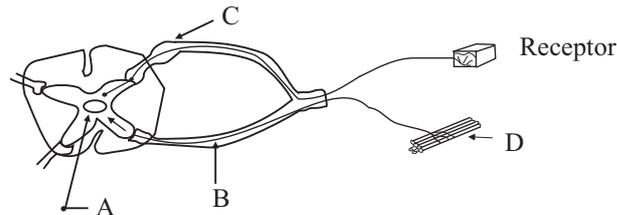
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- Answer three questions selecting one questions each from the section of Biology, Chemistry and physics.

### Part B - Essay

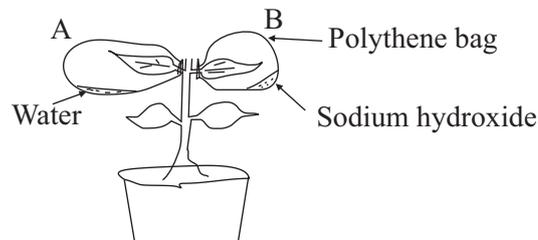
#### Biology

05 A



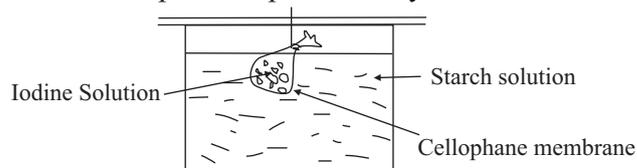
Rough sketch of a reflex arc is given above.

- Name the parts A, B, C and D.
  - State the sequential order of the path taken by the impulse to bring about a reflex action.
  - Reflex actions are two types. Name them and give one examples for each.
  - Skin is the largest organ of the body. There are large number of receptors in it. Name two types of receptors found in the skin.
- B.
- What are Hormones ?
  - Name two hormones which promotes the male and female secondary sexual characteristics.
  - Name the place of synthesis of each hormones above you mentioned.
- C.
- What are the main parts of the male reproductive system ?
  - What is the special feature that uterus possesses for bearing the features.
  - There is a special structure which help to exchange things between mother and embryo. What is it ?
  - Name two things exchange from mother to embryo and embryo to mother.
  - What is the hormone stimulate the mammary glands to produce milk ?
02. Given is an apparatus prepared by a student using a plant which was kept in the dark for 48 hours.



- A.
- What is the hypothesis test by the student.
  - Write the steps of the experiment in order as you would plan it.
  - Give 2 assumptions that made during the process.
  - What is the reason to add sodium hydroxide to one polythene bag ?
  - Why this plant kept 48 hours in dark?

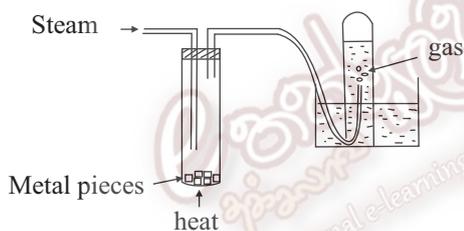
B. Given below is a set-up test the permeability of membrane.



- (i) Give the colour of starch solution.
  - (ii) Give the colour of iodine solution.
  - (iii) Cellophane membrane is only permeable to iodine particles. What will be your observation ?
  - (iv) If the starch solution is in the sac and iodine solution is in the out side what will be your observation ?
- C. (i) Mention the method of absorbing following substances into plants.
- (1) Mineral salts -
  - (2) Water -
- (ii) What is the structure that allows the exchange of air in leaves ?
  - (iii) What do you mean by "transpiration" ?

### Chemistry

01. A. The diagram below illustrates the apparatus set up by a group of students to compare the reactivity of three metals aluminum, magnesium and copper.



They clean the metal surfaces well using sand papers and the metals were cut into pieces of same size. They continuously supplied steam and heat into the boiling tube. The volume of gases collected in the test tube when using equal masses of each metal for equal time periods are measured.

- (i) What is the reason for cleaning the metal surface using sand papers before the experiment.
  - (ii) Write the balanced equation for the reaction of magnesium with steam.
  - (iii) What is the gas that is collected in the test tube.
  - (iv) Give one weakness of this setup.
  - (v) What are the observations they may get by this experiment?
  - (vi) According to that arrange the metals in ascending order of the reactivity.
- B. Iron extraction is done by reducing Haematite ( $\text{Fe}_2\text{O}_3$ ) with Carbon monoxide.
- (i) What are the materials added to the blast furnance from the top of it.
  - (ii) Write down the balanced equations for the reactions taking place inside the blast furnance.
02. A A is a solid ionic compound. Two groups of students conducted experiments on its solubility. Results of these experiments are given below.

#### Experiment 1

Solvent	water	Hexane	Thinner
Mass of A dissolved in 100 g of solvent at room temperature/g	X	Y	Z

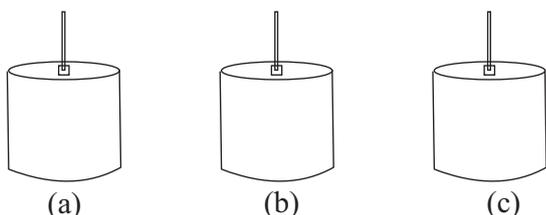
### Experiment 2

Temperature (°C)	30	60	90
Mass of A dissolved in 500 g of water (g)	5.6	6.4	7.8

- (i) Clarify the term solubility.
  - (ii) State two factors which affects solubility.
  - (iii) What is the factor test by students on solubility of A in experiment 1 ?
  - (iv) What could be the higher value out of x and y in experiment 1 ?
  - (v) What is the factor tested by students, on the solubility of A in experiment 2 ?
  - (vi) Calculate the solubility of A in water at 90°C.
- B. (i) A solution of urea is made by dissolving 120 g of urea  $\text{Co}(\text{NH}_2)_2$  and diluting the solution to  $1\text{ dm}^3$ .
- $\text{H} = 1, \text{ C} = 12, \text{ O} = 16, \text{ N} = 14$
- (a) Calculate the molar mass of urea.
  - (b) Calculate the concentration of the solution.
- C. (i) Given below are some solvent?  
Ethanol, Water, Benzen, Acetone, Hexane, Carbon disulphide.  
Classify them into organic polar, Organic non-polar, inorganic polar, inorganic non-polar.
- (ii) Kerosene is used to remove the Jak latexs form the hands but it can not be removed by washing hands with water. Explain this.

### Physics

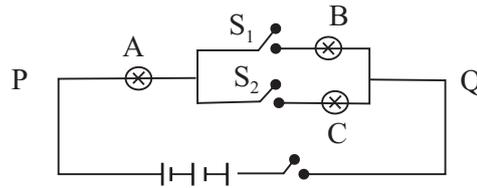
01. A An object starting from rest and travelling along a straight line takes 8 s to acquire a velocity of  $16\text{ ms}^{-1}$  Next it moves at a uniform velocity for 4 s and ultimately decelerates for 4 s before coming to rest.
- (i) Sketch a velocity - time graph for the above motion.
  - (ii) Find the acceleration during the first 8 s?
  - (iii) What is the distance trvelled by the object during first 8 S ?
  - (iv) Find the deceleration during last 4 s?
- B. Three metal cans A, B and C are the same except for their outside surface A is dull black, B is white, C is shinny.



There are fitted thermometers in each can.

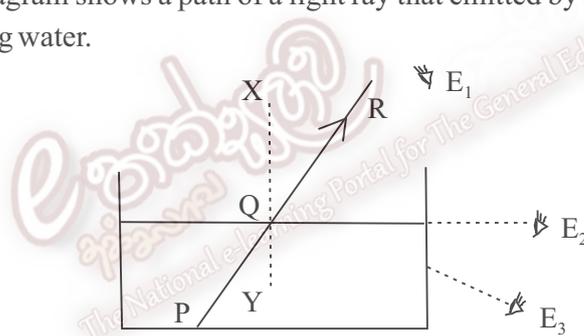
- (i) What could be your observation if you keep the cans close to each other in sunlight for a specific time and read the thermometers ?
- (ii) What is the method of heat transmi to the cans from the sun ?
- (iii) Depending of the observation what is your final conclusion ?
- (iv) As the next experiment A, B and C cans were filled with hot water and kept them in a shade to cool for some known time. What could be your observation ?
- (v) Depending on your observation what is your final conclusion ?

02. A.



Above circuit is with three similar bulbs, three similar cells and three switches.

- (i) How many switches must be closed to flow current through the circuit ?
  - (ii) What are they ?
  - (iii) If the cells connected parallelly what will happen to the luminosity of the bulbs.
  - (iv) Even all the bulbs are similar when all the bulbs are lighting luminosity of a one bulb was higher. What is that bulb ?
  - (v) Find the total resistance of the two bulbs which was connected parallelly. If the resistance of each bulb is  $30\ \Omega$
  - (vi) A compass was kept near the connecting wire of this circuit. It shows a deflection.
    - a) What happens to the deflection of the compass when the terminals of cells are reversed ?
    - b) Explain your observation.
- B. Below diagram shows a path of a light ray that emitted by an object at P, in a glass tank containing water.



- (i) Name the behaviour of the light ray.
- (ii) Name the angle of incidence using the letters given.
- (iii) It is observed that the ray QR travels along the water surface, when eye is kept  $E_2$  and the position of object is adjusted. What is the special name used for the angle of incidence in this situation.
- (iv) If the light ray could be observed by keeping eye at position  $E_3$  name the behaviour of light at that instance.
- (v) Draw ray diagrams to show above two situation.
- (vi) Depth of the liquid in a vessel is 50 cm. An object was kept in the bottom of that vessel. Apparent depth to the position of the object is 40 cm. Calculate the refractive index of the liquid.