

OL/2009/34:E-I

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 Department of Examinations, Sri Lanka
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 විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
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අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2009 දෙසැම්බර්
 ස්වභීථ පොදු ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
 General Certificate of Education (Ord. Level) Examination, December 2009

විද්‍යාව	I	පැය එකයි
வியல்	I	ஒரு மணித்தியாலம்
Science	I	One hour

- Note:** (i) Answer all questions.
 (ii) In each of the questions 1 to 40, pick one of the alternatives (1), (2), (3), (4) which you consider is correct or most appropriate.
 (iii) Mark a cross (X) on the number corresponding to your choice in the answer sheet provided.
 (iv) Further instructions are given on the back of the answer sheet. Follow them carefully.

- Another feature that can be seen in an organism having a soft unsegmented body, covered by a calcium carbonate shell is
 - the presence of jointed limbs.
 - living only on land.
 - the presence of suckers at the two ends of the body.
 - the presence of a muscular foot.
- Which feature given below differentiates algae from fungi?

(1) Presence of a thallus like body	(2) Ability to photosynthesize
(3) Presence of well organised nuclei	(4) Production of spores for reproduction
- Seeds that are dispersed by water, wind and animals are respectively,
 - Indian almond (*kottamba*), drumstick, (*muringa*), cashew (*cadju*).
 - water lily, *apala*, cotton.
 - coconut, rubber, mango.
 - calotropis (*vara*), orchid, love grass (*thuththiri*).
- Select the response that gives the correct scientific name of the shoe flower plant.

(1) Hibiscus Rosasinensis	(2) <i>Hibiscus rosasinensis</i>
(3) HIBISCUS ROSASINENSIS	(4) <i>Hibiscus Rosasinensis</i>
- A type of multinuclear cell is, the

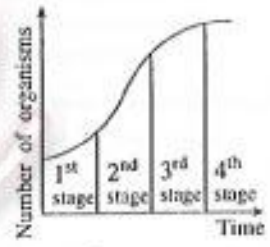
(1) epithelial cell.	(2) smooth muscle cell.
(3) white blood cell.	(4) skeletal muscle cell.
- Which one out of the following factors essential for photosynthesis, cannot be tested experimentally in the laboratory by a student studying about photosynthesis?

(1) Light	(2) Water	(3) Chlorophyll	(4) Carbondioxide
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- The graph given below illustrates the growth of a population. What is the stage at which competition among organisms is at a minimum?

(1) 1 st stage	(2) 2 nd stage
(3) 3 rd stage	(4) 4 th stage
- Select the correct statement out of those given below regarding visual defects.
 - Short sightedness is the situation where objects at a distance can be seen clearly whereas objects that are close cannot be seen clearly.
 - Long sightedness can be corrected by wearing spectacles with suitable concave lenses.
 - Everything around is seen in black and white by persons suffering from total colour blindness.
 - Long sightedness and short sightedness are inherited defects.
- Urea and uric acid which are the main nitrogenous excretory products of man are produced in the

(1) kidney.	(2) liver.	(3) pancreas.	(4) nephrons.
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- An ailing condition caused by a sex linked recessive gene is

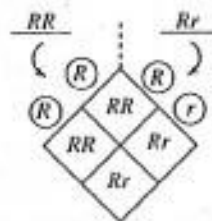
(1) allelism.	(2) haemophilia.	(3) thalassaemia.	(4) sickle cell anemia.
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11. A group of animals with long horns living in a jungle with thorny shrubs, could not run fast, as a result of which they became prey to predators and gradually got destroyed. This reflects,
- (1) struggle for existence. (2) over production.
(3) survival of the fittest. (4) selection.

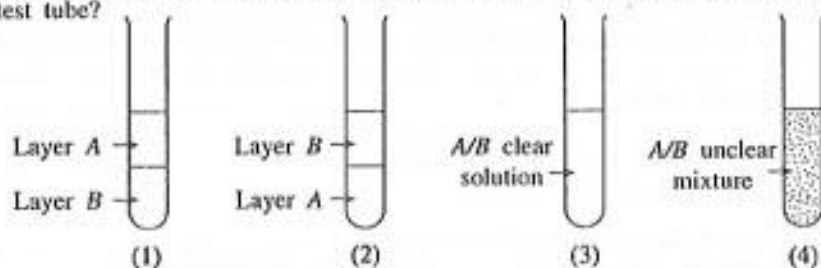
● The question numbers 12 and 13 are based on the following description.

A cross between a homozygous organism and a heterozygous organism is illustrated here. R is the dominant character, while r is the recessive character.



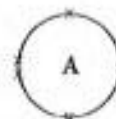
12. The genotype ratio of the F_1 generation is
- (1) 1 : 1 (2) 1 : 2 : 1
(3) 3 : 1 (4) all belong to the same genotype.
13. The phenotype ratio of the F_1 generation is
- (1) 1 : 1 (2) 1 : 2 : 1
(3) 3 : 1 (4) all belong to the same phenotype.

14. Equal volumes of the two liquids A and B , which are equal in polar properties, and which do not react with each other are added to a test tube. What is the most possible way, the two liquids A and B could exist in the test tube?



15. The diagram illustrates how the electrons are arranged in the outer most shell of the element A . Select the most correct statement regarding element A .

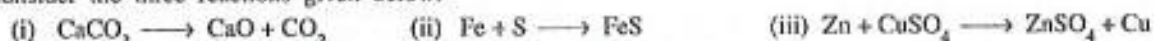
- (1) A is an element belonging to the second period of the Periodic Table.
(2) A is an element belonging to the Group V of the Periodic Table.
(3) Two atoms of A will share three pairs of electrons and form A_2 molecules.
(4) A combines with hydrogen to form a compound with the molecular formula AH_3 .



16. Select the response which states correctly the number of molecules of water present in 9 g of water. [H = 1, O = 16, Avagadro constant = $6.022 \times 10^{23} \text{ mol}^{-1}$]

- (1) $\frac{6.022 \times 10^{23}}{9 \times 18}$ (2) $\frac{18}{9} \times 6.022 \times 10^{23}$ (3) $\frac{9}{18} \times 6.022 \times 10^{23}$ (4) $9 \times 18 \times 6.022 \times 10^{23}$

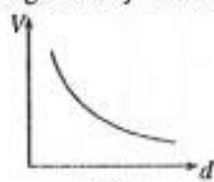
17. Consider the three reactions given below.



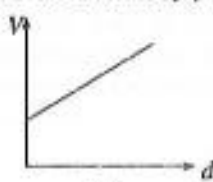
What are the types of reactions given below, to which the reactions (i), (ii) and (iii) are examples respectively?

- (1) combination, decomposition and single displacement
(2) decomposition, combination and double displacement
(3) decomposition, single displacement and combination
(4) decomposition, combination and single displacement
18. What is the measurement that is not suitable to find out the effect of concentration of hydrochloric acid on the rate of reaction between CaCO_3 and hydrochloric acid?
- (1) volume of CO_2 evolved during a unit time (2) time taken to evolve a unit volume of CO_2
(3) time taken to initiate evolution of CO_2 (4) time taken for evolution of CO_2 to terminate
19. The composition of a solution of sodium chloride is 58.5 g dm^{-3} . What is the response that gives the composition of this solution expressed correctly in another way? [Na = 23, Cl = 35.5]
- (1) 58.5 mol dm^{-3} (2) 5.85 mol dm^{-3} (3) 1 mol dm^{-3} (4) 0.1 mol dm^{-3}
20. Given below are some characteristics that are common to a certain group of elements. They
- are solids at room temperature.
 - are good conductors of heat.
 - form basic oxides
- This group of elements belongs to,
- (1) metals. (2) non-metals. (3) metalloids. (4) noble gases.

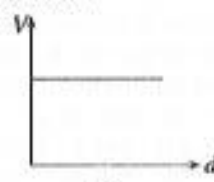
21. The element that is used in vulcanizing rubber as well as a fungicide is
 (1) C (2) N (3) Na (4) S
22. Which reaction given below would show a colour change during heating?
 (1) $2\text{NaHCO}_3(\text{s}) \longrightarrow \text{Na}_2\text{CO}_3(\text{s}) + \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{g})$ (2) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}(\text{s}) \longrightarrow \text{CuSO}_4(\text{s}) + 5\text{H}_2\text{O}(\text{g})$
 (3) $\text{CaCO}_3(\text{s}) \longrightarrow \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$ (4) $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}(\text{s}) \longrightarrow \text{Na}_2\text{CO}_3(\text{s}) + 10\text{H}_2\text{O}(\text{g})$
23. Which one of the following gives the correct number of atoms of carbon, oxygen, nitrogen and hydrogen respectively, in a molecule of urea $\text{CO}(\text{NH}_2)_2$?
 (1) 1, 1, 1 and 2 (2) 2, 2, 2 and 4 (3) 1, 1, 2 and 4 (4) 1, 1, 2 and 2
24. The raw materials used in the large scale extraction of essential oils in Sri Lanka are
 (1) cinnamon and citronella. (2) cardamom and nutmeg.
 (3) lemon grass and pinus. (4) clove and rose.
25. A balloon filled with air and tied to a large mass is immersed in the water in a reservoir. Which graph illustrates correctly the variation of the distance (d) travelled by the balloon from the surface of water longitudinally downwards and the volume (V) of the balloon?



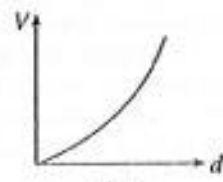
(1)



(2)



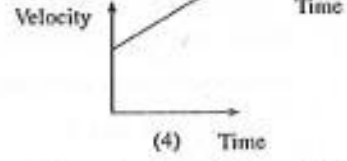
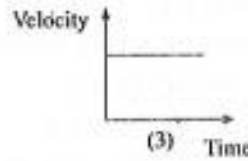
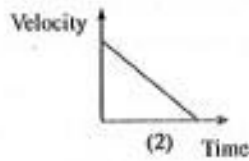
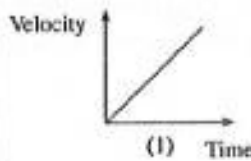
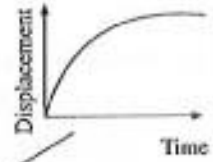
(3)



(4)

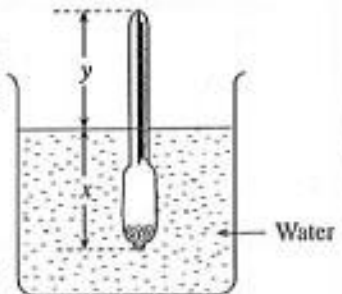
26. What principle out of those given below is used in the photocopying machine?
 (1) Electrolysis (2) Transference of heat
 (3) Electrostatic charges (4) Electrodynamics
27. For light rays to undergo total internal reflection,
 A - light rays should enter from a denser medium to a rarer medium.
 B - the angle of incidence in the denser medium should be greater than the critical angle.
 C - light rays should enter from a rarer medium to a denser medium.
 D - the angle of incidence in the rarer medium should be greater than the critical angle.
 Out of the above the correct ones are
 (1) A and B only. (2) A and C only. (3) C and D only. (4) all are correct.
28. What should be done to increase the mechanical advantage of any machine?
 (1) Increase the length of the effort arm irrespective of the load
 (2) Increase the length of the load arm more than that of the effort arm
 (3) Decrease the effort relative to the load
 (4) Nothing can be stated as the type of machine is not known
29. Multiflexing method is used, in transmitting information in communication, using wires as well as in wireless communication. What is referred to as multiflexing is
 (1) sending a large number of signals at a time through one channel.
 (2) using several channels to send a large number of signals.
 (3) sending a signal to several transmission towers through one channel.
 (4) sending various signals at different instances through one channel.
30. Fleming's left hand rule can be used
 (1) to find the direction of current induced by the movement of a conductor kept in a magnetic field.
 (2) to find the direction of movement of a conductor carrying a current when kept in a magnetic field.
 (3) to find the direction of the magnetic field around a conductor carrying a current.
 (4) to find the direction of movement of a conductor carrying a current.
31. Consider the statements given below regarding the electrical accessories used in a household electrical circuit.
 A - the electricity supply to the house can be disconnected when necessary by the service fuse.
 B - the tripe switch is placed at a point before the service fuse.
 C - electricity is distributed to various parts of the house by the fuse box.
 D - the electricity supplied to the house is controlled by the electric meter.
 Out of these the correct ones are
 (1) A, B and C only. (2) A and C only. (3) A and D only. (4) B and D only.

32. Given here is a time-displacement graph drawn using the data gathered during a laboratory experiment carried out by a group of students, regarding the movement of a trolley. Which time-velocity graph given below could fit most appropriately to the movement of the trolley?



33. An object of mass m placed on a smooth horizontal table, is moved by applying a horizontal force F . If the mass of the object is doubled and is moved by applying the same horizontal force F , the new acceleration with which the object can move is
 (1) half the acceleration at the first instant. (2) twice the acceleration at the first instant.
 (3) equal to the acceleration at the first instant. (4) $\frac{1}{4}$ of the acceleration at the first instant.

34. An instance where a hydrometer is immersed in a vessel of water is shown in the diagram. The length of the part of the hydrometer that is dipped inside the water is x and the length of the part that is above the water is y . If kerosene oil is used instead of water the value of y ,
 (1) will not change. (2) will be less than x .
 (3) will decrease. (4) will increase.

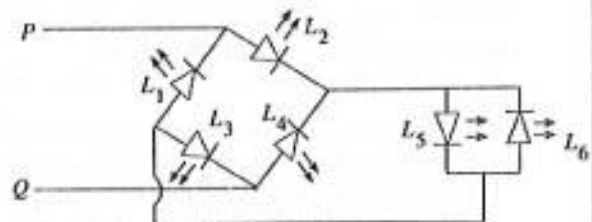


35. A diagram of a logic gate is given below. A and B are inputs while Z is the output. Select the response which gives the values that the input signals could have for the output to be '1', when considering the higher voltage signal level as '1' and lower voltage signal as '0'
 (1) $A = 1, B = 0$ (2) $A = 0, B = 1$
 (3) $A = 0, B = 0$ (4) $A = 1, B = 1$



- Answer the questions 36 and 37 using the following diagram.

This diagram illustrates a rectifier model circuit planned by a student. L_1, L_2, L_3, L_4, L_5 and L_6 are six identical LEDs.



36. Which LEDs will light up when the positive terminal of a supply of 6 V direct current is connected to P and the negative terminal is connected to Q
 (1) L_2, L_5, L_3 (2) L_2, L_3, L_3 (3) L_2, L_5, L_4 (4) L_1, L_4, L_5
37. What observation could be made out of the following when an alternate current supply of 6 V, 50 Hz is connected in between P and Q ?
 (1) All LEDs will light up (2) L_2, L_3, L_5 and L_1, L_4, L_6 will light up alternately
 (3) L_1, L_2, L_3, L_4, L_5 will keep continuously lighted (4) Only L_1, L_2, L_3, L_4 will light up

38. What could be the group of chemical substances which possesses all of the characteristics given below. They
 ● remain unchanged in the environment for a long time. ● are poisonous.
 ● spread across a wide area.
 ● accumulates in the bodies of living organisms via food chains.
 (1) detergents. (2) germicides. (3) pesticides. (4) preservatives.

39. During the past few days health officials have focused their attention on using a certain species of bacteria to control the dengue mosquito menace in Sri Lanka. This method of control is an example for
 (1) chemical control. (2) physical control. (3) biological control. (4) massacre.

40. The depletion of the ozone layer could be regarded as an unfavourable result of the changes in the balance of the natural environment caused by human activities. An adverse effect directly experienced by man due to this is
 (1) global warming. (2) rising of the sea level.
 (3) falling prey to respiratory diseases. (4) falling prey to skin cancers.