

# Science I

Grade 11

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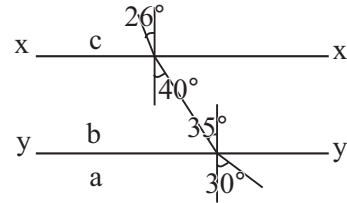
Time: 01 Hour

Name/ Index No.

● Answer all the questions.

01. Following diagram shows a light ray which travels through a, b, c medium separated by  $xx'$ ,  $yy'$  surfaces. Mediums a, b, c can be,

- (1) a - water, b - air, c - water
- (2) a - water, b - glass, c - water
- (3) a - water, b - air, c - glass
- (4) a - water, b - water, c - glass



02. A fish swimming in a river can be seen by a bird which flies parallel to the surface of water,

- (1) as moving below the swimming level
- (2) as moving above the swimming level
- (3) as moving along the swimming level
- (4) as moving on surface of water

03. What is expected by applying a fuse to the domestic circuit ?

- (1) giving a safety signal.
- (2) giving electricity continuously.
- (3) sending electricity through wires with low melting point.
- (4) breaking circuit, if the current flows through the circuit exceeds the rated value.

04. Which statement is true for all three types of plane mirrors, concave mirrors and convex mirrors ?

- (1) form erect images only.
- (2) form virtual images only.
- (3) form images by reflecting light.
- (4) Having at least one occasion with an image equal to object in size.

05. Ascending Order of electro magnetic waves; Uv rays, X-rays, visible light and IR rays according to their frequency is,

- (1) IR rays, visible light, UV rays, X-rays
- (2) X-rays, visible light, IR rays, UV rays
- (3) UV rays, visible light, IR rays, X-rays
- (4) Visible light, IR rays, UV rays, X-rays

06. Following characteristics could be seen in an image of an object kept at a concave mirror.

- |               |                                        |
|---------------|----------------------------------------|
| ★ real image. | ★ form in the same side of the object. |
| ★ inverted    | ★ magnified                            |

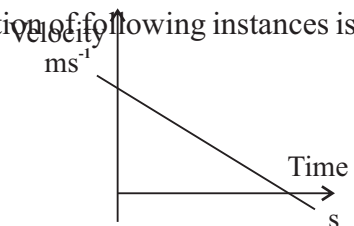
Object is kept,

- |                     |          |
|---------------------|----------|
| (1) between F and C | (2) at C |
| (3) between F and P | (4) at P |

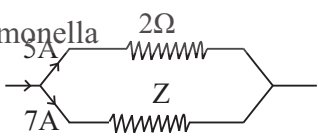
07. If a virtual, erect image which equals to the object in size can be obtained when an object kept in any place in front of a mirror, then the mirror which used here is can be a,

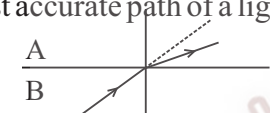
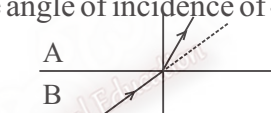


- |                   |                    |
|-------------------|--------------------|
| (1) convex mirror | (2) concave mirror |
| (3) plane mirror  | (4) None of above  |

08. The reason for the refraction when a light ray travels from a transparent medium to that of another medium is,  
 (A) because speed of the light changes according to the medium.  
 (B) difference of densities of two mediums.  
 (C) Incidence of light beams inclinedly to the surface of medium.  
 True statements from the above are,  
 (1) A and B only (2) A and C only (3) A, B, C (4) B and C only
09. By using a slinky in laboratory,  
 (1) transverse waves can be demonstrated.  
 (2) longitudinal waves can be demonstrated.  
 (3) transverse waves, longitudinal waves and earth quake waves can be demonstrated.  
 (4) both transverse waves and longitudinal waves can be demonstrated.
10. The audible frequency range of sound waves of human is,  
 (1) 330 Hz - 340 Hz (2) 200 Hz - 2000 Hz (3) 20 Hz - 25000 Hz (4) 20 Hz - 20000 Hz
11. What is used by the bat to detect obstacles when flying in night ?  
 (1) visible light waves of electro magnetic spectrum  
 (2) sound waves  
 (3) longitudinal waves  
 (4) Ultra sound waves
12. If a longitudinal wave with the frequency of 680 Hz transmits in air at a speed of  $340\text{ms}^{-1}$ , wave length of this wave is,  
 (1) 0.5 m (2) 5 cm (3) 5.0 m (4) 25 cm
13. Following characteristics could be seen in a certain type of waves.  
 ★ speed is  $3 \times 10^8 \text{ms}^{-1}$  ★ has electric and magnetic qualities  
 ★ no need a medium to be transmitted  
 This wave can be a,  
 (1) mechanical wave (2) earth quake wave  
 (3) electro magnetic wave (4) ultra sound wave
14. Human voice is produced by,  
 (1) movements of tongue (2) exhale air comes out from lungs.  
 (3) vibrating tissues at pharynx (4) vibrating vocal codes of larynx.
15. A non-flowering plant with seeds is,  
 (1) fern (2) cycus (3) palmyra (4) liverwort
16. Plum pudding model about atomic structure was introduced by,  
 (1) J. J. Thomson (2) Earnest Rutherford  
 (3) Goldstein (4) James Chadwick
17. Following diagram shows a velocity time graph. Which motion of following instances is represented by it?



- (1) motion of an object unhandled from the sky.  
 (2) motion takes place in linear path.  
 (3) motion of an object thravn upward from downward.

- (4) motion of a craft starts to travel from earth to the space.
18. The instrument used to measure rate of transpiration of a plant is,  
 (1) Barrometer (2) Potometer (3) Hygrometer (4) Anemometer
19. The most harmful situation can be occurred due to a leakage of radiation or an accidental explosion of a nuclear power station is,  
 (1) death of employees work in station because of fire  
 (2) increasing acid rains because of air pollution resulted from heavy smoke and heat released.  
 (3) longlasting harmful influence for organisms caused by harmful rays released to atmosphere.  
 (4) destruction of marine organisms because of heating water in sea closer to power stations.
20. An instance that the total internal reflection and dispersion can be identified is,  
 (1) mirage (2) optical fibres (3) rain bow  
 (4) appearing the bottom of a well as it is above the real level.
21. The most accurate statement about binomial nomenclature of an animal is,  
 (1) first genus name and secondly species name to be written.  
 (2) first species name and secondly genus name to be written  
 (3) when writing italic letters to be used.  
 (4) when printing the scientific name to be underlined.
22. Smooth muscles can be seen in,  
 (1) bladder (2) heart (3) skin (4) as
23. Bacteria, funi, algae and protozoa are micro - organisms of the same group. Examples for each organism are in order,  
 (1) penicilin, salmonella, spyrogyra, amoeba  
 (2) vibrio, penicilin, chlamidomonas, paramecium  
 (3) mildew, salmonella, paramecium, amoeba  
 (4) paramecium, chlamidomonas, spirogyra, salmonella
24. Resistance of Z is,  
 (1)  $2\Omega$  (2)  $5\Omega$   
 (3)  $7\Omega$  (4)  $10\Omega$
- 
25. Process which caused for melting ice in polar regions and changes of climate is,  
 (1) destruction of ozone layer (2) lightning  
 (3) grenhouse effect (4) acid rain
26. Which characteristic of sound helps to identify by separating female voice from male voice?  
 (1) pitch (2) wave length (3) loudness (4) quality of sound
27. The chamber with thicker wall than the other chambers of human heart is,  
 (1) right auricle (2) right ventricle (3) left auricle (4) left ventricle
28. Select the false statement from the following statements,  
 (1) Transportation of food through phloem tissue takes place according to the theory.  
 (2) Evaporation is a method of dormant transportation.  
 (3) Absorption of substances by using energy is called active transportation.

- (4) Plasma membrane is permeable for water as well as mineral salts.
29. Atomic mass unit is,  
 (1) the mass of  $^1_1\text{H}$  atom (2) the mass  $^{12}_6\text{C}$  atom  
 (3) 1/12 of the mass of  $^{12}_6\text{C}$  atom (4) 1/16th of mass of  $^{16}_8\text{O}$  atom
30. How many molecules of water contain in 18g of water? (H=1, O=16)  
 (1)  $6.022 \times 10^{23}$  (2)  $2 \times 6.022 \times 10^{23}$  (3)  $\frac{6.022 \times 10^{23}}{2}$  (4)  $18 \times 6.022 \times 10^{23}$
31. Chemical formula of the oxide of the element A is  $\text{A}_2\text{O}_3$ , chemical formula of its sulphate is,  
 (1)  $\text{A}_2\text{SO}_4$  (2)  $\text{ASO}_4$  (3)  $\text{A}_2(\text{O}_4)_3$  (4)  $\text{A}_3\text{SO}_4$
32. Transmission of heat occurs by the movement of particles is known as,  
 (1) conduction of heat (2) radiation  
 (3) convection (4) non of the above
- |   |   |    |     |
|---|---|----|-----|
| 1 |   | ii | iii |
| 2 |   |    |     |
| 3 | L | M  | Q   |
| 4 | R |    |     |
33. A part of the periodic table is shown below. What is the ascending order of metallic properties of elements L, M, Q and R given here?  
 (1)  $\text{M} < \text{L} < \text{Q} < \text{R}$  (2)  $\text{Q} < \text{M} < \text{L} < \text{R}$   
 (3)  $\text{Q} < \text{M} < \text{R} < \text{L}$  (4)  $\text{R} < \text{Q} < \text{M} < \text{L}$
34. Critical angle for the rarer medium A and denser medium B is  $35^\circ$ . Which diagram shows the most accurate path of a light ray which falls at the angle of incidence of  $42^\circ$ ?  
 (1)  (2)   
 (3)  (4) 
35. What is used to find the direction of force acts on a conductor which kept in a magnetic field and an electric current goes through it?  
 (1) Fleming's left hand rule (2) Fleming's right hand rule  
 (3) Faraday's law (4) Ohm's law
36. It is needed to convert 240 V of alternative current into 12V of direct current. Number of turns of primary coil of the transformer used here is 1000. Number of turns of the secondary coil and the type of transformer to be used here is,  
 (1) step-up transformer with 50 turns (2) step - down transformer with 50 turns.  
 (3) step - down transformer with 100 turns (4) step - up transformer with 200 turns.
37. Mass of NaOH needed to prepare 250 ml of NaOH solution with  $0.5 \text{ mol dm}^{-3}$  is, (Na=23, O=16, H=1)  
 (1)  $\frac{40}{1000} \times 250 \text{ g}$  (2)  $\frac{20}{1000} \times 250 \text{ g}$  (3)  $\frac{0.5}{1000} \times 250 \text{ g}$  (4)  $\frac{1000}{40} \times 250 \text{ g}$
38. What is the most suitable fire extinguisher for fire on wood, clothes, papers etc. ?  
 (1) Type A (2) Type B (3) Type C (4) Type D
39. Which group of elements obtains Nobel gases configuration by only removing electrons?  
 (1) H, Li, C (2) Na, K, Ca (3) H, F, Cl (4) C, O, N
40. Polythene is a highly used substance in modern world. Polythene consists of,

# Science II

Grade 11

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Time: 03 Hours

Name/ Index No.

- Answer all the questions.

## Part A - Structural Essay

01.A Evaporation of water from plant surfaces is called transpiration.

(1) According to the method which transpiration takes place, it can be categorized into types. What are these 03 types.

1. .... 2. ....

3. .... (03 m.)

(2) Glucose produced by a plant, converts into another type of sugar before the transportation. What is this type of sugar? ..... (01 m.)

(3) Name the tissue which transport above type of sugar. (01 m.)

.....

(4) Name two types of living cells in the above tissue. (02 m.)

.....

B The digestion and the absorption of food in human body take place in the digestive system.

(1) Write 02 adaptations in the small intestine digest food. (02 m.)

1. .... 2. ....

(2) Name the simplest food types which absorb by blood capillaries and lactials.

1. Blood capillaries .....

2. Lactials ..... (01 m.)

C Following are three features of an animal in a water pool.

❖ Have    ❖ Has a streamline body    ❖ Body is covered with scales has franchia

(1) What is the animal group that the above organism belong? (01 m.)

.....

(2) Name another 02 animals belong to above group. (02 m.)

1. .... 2. ....

(3) Write the two names which are used in writing the scientific name of an animal.

..... (02 m.)

.....

02.A The voltage of the current in national grid of Sri Lanka is 230V and the frequency is 50 Hz.

(1) Name 02 instruments in the domestic electric circuit from the electric meter to the distribution box. (02 m.)

1. .... 2. ....

(2) Fuses are used for the protection of the domestic electric circuit.

(a) Name the two metals which contain in the alloy which is used to make the fuses. (02 m.)

1. .... 2. ....

(b) Name 02 features that should be in the above alloy. (02 m.)

1. .... 2. ....

(c) What is the instrument used today instead of the fuses in the distribution box.

..... (01 m.)

B The heating effect of the current is used in different instances.

(1) Name two instruments which the heating effect of current is used. (02 m.)

1. .... 2. ....

(2) The heating coil in most of these instrument is made of Nichrome metal. Write 02 reasons to use this metal. (02 m.)

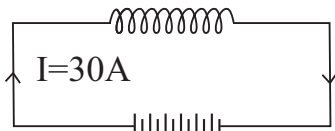
1. ....

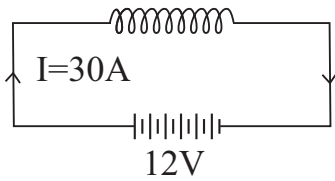
2. ....

(3) If the current is  $I$  and the voltage is  $V$  and the time of passing the current through a Nichrome wire is  $t$  and the energy generated is  $E$ ,

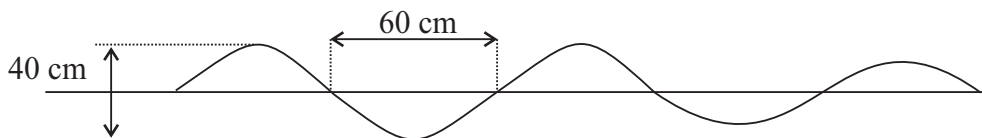
(a) Write an equation for  $E$ . (01 m.)

.....

(b)  When passing the current within 2 minutes, calculate the energy generated by the coil in this circuit. (03 m.)



03.A Following is a graph of a wave.



- (1) What is the wave length of this wave? (01 m.)  
.....
- (2) What is the amplitude? (01 m.)  
.....
- (3) If this wave is occurred within 0.5 seconds what is the frequency of the wave? (02 m.)  
.....
- (4) Calculate the velocity of this wave. (02 m.)  
.....
- (5) There are three types of earthquake waves. Name them. (03 m.)  
1. .... 2. ....  
3. ....
- (6) Name the longitudinal wave from the above types. (01 m.)  
.....

B Fill the blanks of the following paragraph.

- (1) When speaking inside an office room which is covered with glass completely, that sound is heard over and over again. This phenomena is called (a) ..... This is happening according to the (b) ..... of sound waves. A type of high frequency sound waves produced by bat (c) ..... faces to the above phenomena and help to find the way. (03 m.)
- (2) Put (✓) or (x) (02 m.)
  - (a) Light wave is a type of electro magnetic waves ( )
  - (b) Sound wave is of mechanical waves ( )

04.A Following is a part of the periodic table. The symbols are not standard. use only the given symbols when writing the answer.

								A
B							C	
	D							

- (1) Write the electronic configuration of the element D. (01 m.)  
.....

(2) Write a special feature of the group which A belongs. (01 m.)

.....

(3) Write the period and the group that the element C belongs. (02 m.)

1. Period .....

2. Group .....

(4) Write the chemical formula of the compound formed between B and C. (02 m.)

.....

(5) What is the type of bond between B and C. (01 m.)

.....

B There are several types of compounds in an iron ore which is used to extraction of iron.

(1) Write 02 (02 m.)

1. .... 2. ....

(2) Name 02 other substances collected with haematite to the Blast furnace. (02 m.)

1. .... 2. ....

(3) Write the balanced chemical equation for the reaction of the haematite with carbon monoxide. (03 m.)

.....

.....

(4) Which part of the blast furnace has the highest temperature which is used for extraction of iron? (01 m.)

.....



**Part B Essay**

**Biology**

05. A Following diagram shows a part of a excretory system in.

(1) Name the parts A, B, C, D (01 m.)

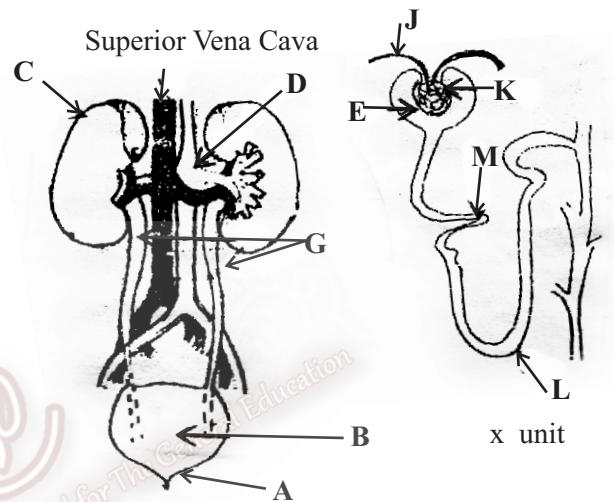
(2) What is the structure, and named as X?  
(04 m.)

(3) Name the parts K, E, L, J?(02 m.)

(4) Mention the type of muscles contains in B and write down a characteristic of it. (01 m.)

(5) Write a modification of structure given by K for increasing its efficiency. (01 m.)

(6) main excretory product produced by this system is urine. Write down 3 constituents of it. (03 m.)



B mechanism of human respiration is taken place by the two steps; inspiration and expiration.

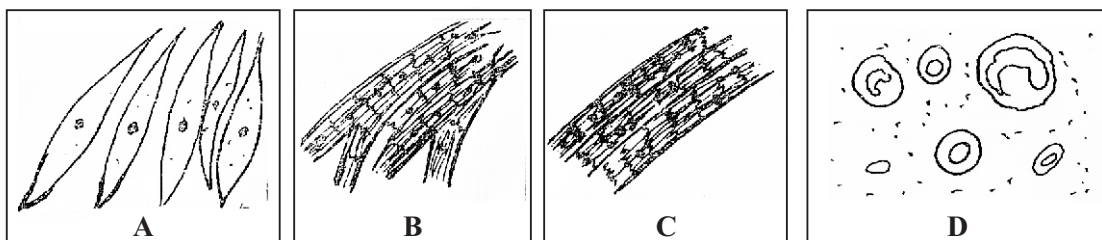
(1) Pharynx belongs to both digestive system and respiratory system. What is the special structure in it to prevent entering food to respiratory system? (01 m.)

(2) What is the structure of trachea which helps to produce voice? (01 m.)

(3) Explain the way of producing voice by the structure mentioned in above. (01 m.)

(4) Write 02 parts of respiratory system which can be blocked directly because of smoking. (02 m.)

06. Following figures shown several animal tissues.

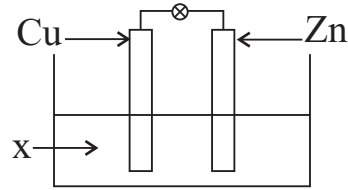


- (1) Name above tissues A, B, C, D. (04 m.)
- (2) Name 2 tissues from the above which act involuntarily. (02 m.)
- (3) What is the tissue connects with skeletal ? Write 2 characteristics of it. (03 m.)
- (4) Name 2 main functions done by the tissue D. (02 m.)
- (5) What is the characteristic can be seen in only B, but not in A and C ? (02 m.)
- (6) Mention 3 places of the body, which A, B, C tissues can be seen in. (03 m.)
- (7) Name 2 places of human body that each epitheliam tissue mentioned below can be seen in.
  - (a) Ciliated epithelium (02 m.)
  - (b) Columnar epithelium (02 m.)

### Chemistry

07. Substances which earth made up are known as matters. Matter made up of elements and compounds are formed by combining elements.
- (1) Name 03 types of cub atomic particles. (03 m.)
  - (2) Name the scientists who found the above sub atomic particles at first. (03 m.)
  - (3) Describe the following terms.
    - (a) Atomic number (02 m.)
    - (b) Mass number (02 m.)
  - (4) What are Iso topes ? (02 m.)
  - (5) Which type of bond contains in the compound which formed by combining atoms of Na and Cl elements. (01 m.)
  - (6) Write down 3 characteristics of the compounds with the above bond mentioned in. (03 m.)
  - (7) Calculate the molecular mass of following compounds. (04 m.)
    - (a)  $K_2CO_3$  [K - 39, C - 12, O - 16]
    - (b)  $(NH_4)_2SO_4$  [N - 14, H - 1, S - 32]
08. A(1) What is known as mollar mass ? (02 m.)
- (2) How many atoms contain in a mole of atoms ? (01 m.)
  - (3) Calculate the number of atoms contain in 12 g of Mg. (02 m.)
  - (4) Find the number of moles in 500 g of Calcium Carbonate. (03 m.)
  - (4) Find the mollars mass of Glucose (02 m.)

B Following diagram shows a chemical cell.

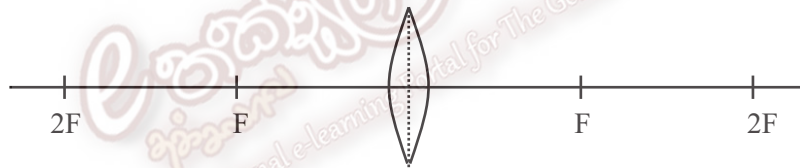


- (1) Name X. (01 m.)
- (2) Name the Anode and Cathode of the cell. (02 m.)
- (3) Write down the chemical reaction takes place at Zn plate. (03 m.)
- (4) Name 2 errors of this cell. (02 m.)
- (5) Write down an observation you can see at the Cu plate. (02 m.)

### Physics

09. A An experiment was planned to show that the variation of size of the image and the position when an object is kept at a convex lens.

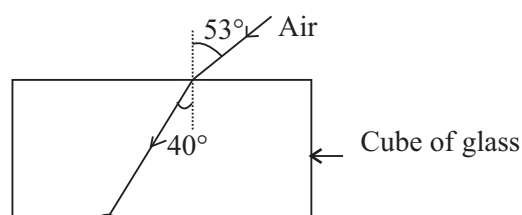
- (1) What is the first reading to be taken regarding the lens for doing this experiment ? (01 m.)
- (2) Explain the way of obtaining that reading briefly. (03 m.)
- (3)



Mention the places where the screen and the lighted object to be kept to get an image on to a screen as described below using the above diagram.

- (a) real, inverted, diminished image (02 m.)
- (b) real, inverted, image same size as object (02 m.)
- (c) real, inverted, magnified object (02 m.)
- (4) What is the place that the object to be kept to obtain an erect object by using this lens? (01 m.)
- (5) Mention 2 other characteristics of that image. (02 m.)

B Following is a diagram of a glass cube which is kept on a patch of ink on a white paper.



- (1) What is the phenomena that can be occurred due to light according to this diagram. (01 m.)
- (2) What down the values given here for the angle of incidence and angle of refraction. (02 m.)
- (3) Find the refractive index of glass, if  $\sin 40^\circ = 0.64$  ,  $\sin 53^\circ = 0.80$  (03 m.)
- (4) There's another method for finding refractive index of glass in addition to the method used in (3). Mention the equation used for that. (01 m.)

10.A The result due to electric current flows through a conductor known as effect of electric current. One of effects is heating effect.

- (1) Write down 2 more effects of electric current except heating effect. (02 m.)
- (2) Describe the reason for heating effect when flowing an eclectic current through a conductor. (02 m.)
- (3) The filament which is used in a bulb is made as a thin coil. How do these two characteristics effect to its function? (02 m.)
- (4) Resistane of a heating coil which conduct 5A currant is  $70\Omega$ . What is the amount of energy generated by this coil in 2.5 minutes. (03 m.)
- (5) Power of an immersion heater is 1500W.
  - (a) What is the amount of heat energy generated by this immersion heater withing 40 seconds. (02 m.)
  - (b) It the above immersion heater is dipped in a vessel with 1kg of water in 21 seconds. (Assume that heat generated by the coil is taken by water completely)
    - (i) Calculate the amount of heat that obtained by water. (01 m.)
    - (ii) Calculate the temperature of water increased using the equation  $E = mc\theta$  (Specific heat capacity of water is  $4200 \text{ JKg}^{-1}\text{K}^{-1}$ ) (03 m.)

B Chemical effects of electricity are used in various daily activities.

- (1) Draw the diagram of a set of apparatus which is suitable to collect gaseous product removed in the electrolysis of acidic water. (03 m.)
- (2) What is known as electro plating. (02 m.)