



2018 IV 11

0930

Seat No. :

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Time : 2½ Hours

SCIENCE (E)

Subject Code

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Total No. of Questions : 5

(Printed Pages : 8)

Maximum Marks : 65

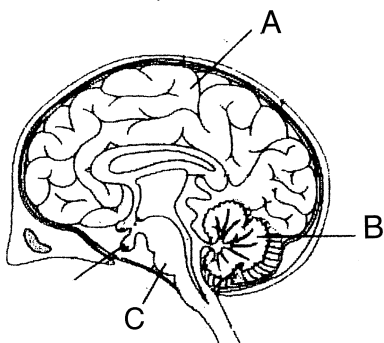
- INSTRUCTIONS** :
- The question paper consists of **five** questions of **13** marks **each**.
 - All** questions are **compulsory**.
 - There is no overall choice, however internal choice has been provided in two questions of **three** marks and **two** questions of **four** marks category. You have to attempt **only one** option in such questions.
 - Begin **each** question on a fresh page.
 - Figures to the **right** indicate **full** marks.

1. A) i) Select the correct alternative from those given below each statement and write the completed statement : [1]
- a) Aluminium is obtained by the electrolytic reduction of _____
- Aluminium sulphide
 - Aluminium oxide
 - Aluminium carbonate
 - Aluminium nitrate
- b) Iodine is a non-metal and it is _____
- Malleable
 - Ductile
 - Sonorous
 - Lustrous
- ii) Name the following : [1]
- Receptors that detect taste.
 - Hormone that regulates the growth and development in human beings.
- iii) Write one harmful effect of ultra violet radiations in human being. [1]
- iv) Why should we not throw small pieces of sodium into a laboratory sink ? [1]
- B) i) a) Given below are some organisms. Arrange all of them in a food chain and show the direction of flow of energy. [2]
- Eagle, grasshopper, frog, grass, snake.



- b) Which of the organism in the above food chain has maximum amount of energy ?
- c) Give an example of artificial ecosystem.
- ii) An environmentalist on a visit to your school suggested various methods to save the environment. [2]
- a) What does the term 'Reduce' refer to ?
- b) List any two advantages of water harvesting.
- iii) Answer the following : [2]
- a) How do we extract metals low in activity series from their ores ?
- b) What is anode mud ?
- C) i) David and Debbie were riding a bike without helmets and met with an accident.

Observe the diagram of the human brain and identify the part of brain marked A, B or C affected in the following cases. [1]



- a) Debbie had an instant death.
- b) David lost all his memory and ability to think.
- ii) What happens at the synapse between two neurons ? [1]
- iii) Why is it advisable to have iodized salt in our diet ? [1]
2. A) i) Select the correct alternative from those given below each statement and write the completed statement : [1]
- a) Brown fumes emitted when lead nitrate is heated are of _____
- Nitrogen dioxide
 - Lead oxide
 - Lead
 - Nitric acid
- b) Respiration is an example of _____
- Exothermic reaction
 - Endothermic reaction
 - Displacement reaction
 - Precipitation reaction



- ii) Name the following : [1]
a) The first enzyme to mix with food in the digestive tract.
b) The smallest blood vessels with one cell thick walls.
- iii) Answer the following : [2]
a) Calcium compound having an odour of chlorine is used to remove yellowness of white clothes in laundries. Name the compound.
b) Write the formula of a salt that contains water of crystallization.
c) On what does the strength of a base depend ?
- B) i) Translate the following statement into chemical equation : [2]
a) Hydrogen sulphide gas burns in air to give water and sulphur dioxide.
b) Balance the above equation.
- ii) Answer the following : [2]
a) How are alveoli designed to maximise the exchange of gases ?
b) Write a point of difference between parasites and saprophytes.
- iii) Explain the following giving reasons : [2]
a) Why does tooth decay start when the pH of the mouth is lower than 5.5 ?
b) Plaster of Paris is utilized in making cast for broken limbs in hospitals.
- C) i) Draw the diagram of open and closed stomata and label : [3]
a) chloroplast
b) guard cells.
- ii) What is the source of oxygen produced during photosynthesis ?
- iii) In which form are Carbohydrate stored in plants ?

OR

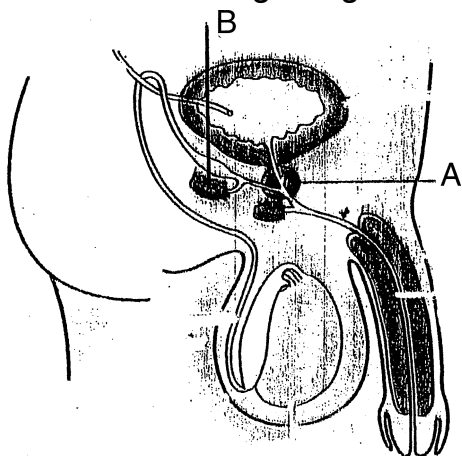
- C) i) Draw the diagram of human excretory system and label : [3]
a) urinary bladder
b) urethra.
- ii) Name two major components of normal human urine.
3. A) i) Match the following : [1]
a) Eka-Boron – Gallium
b) Eka-silicon – Scandium
– Germanium
- ii) Identify and name the following compounds : [1]
a) $\text{CH}_3\text{CH}_2\text{CHO}$
b) $\text{CH}_3 - \underset{\text{O}}{\overset{\parallel}{\text{C}}} - \text{CH}_2 - \text{CH}_3$.



- iii) Why do variations arise in progeny during sexual reproduction ? [1]
iv) State two demerits of Mendeleev's classification of elements. [1]
v) Answer the following : [2]
a) State two characteristic features of carbon which when put together give rise to large number of carbon compounds.
b) Give a point of difference between soaps and detergents.
- B) i) The following table shows the position of six elements A, B, C, D, E and F in the modern periodic table : [2]

Group ⇒ Period ↓	1	2	3/12	13	14	15	16	17	18
2	A					B			C
3		D			E				F

- a) Which element is a metal with valency 2 ?
b) Which element is a non-metal with valency 3 ?
c) Out of D and E which one has a bigger atomic radius and why ?
- ii) Study the equations and answer the following : [1]
- a) $\text{CH}_3\text{CH}_2\text{OH} \xrightarrow{\text{acidic K}_2\text{Cr}_2\text{O}_7} \text{CH}_3\text{COOH}$
What is the role of $\text{K}_2\text{Cr}_2\text{O}_7$ in the above reaction ?
- b) $\text{CH}_3\text{CH}_2\text{OH} \xrightarrow[\text{H}_2\text{SO}_4]{\text{hot con}} \text{CH}_2 = \text{CH}_2 + \text{CHO}$
What is the role of H_2SO_4 in the above reaction ?
- C) Reproducing organisms create new individuals that look very much like themselves. [4]
i) Observe the diagram given below and answer the question :



What is the function of parts marked A and B ?

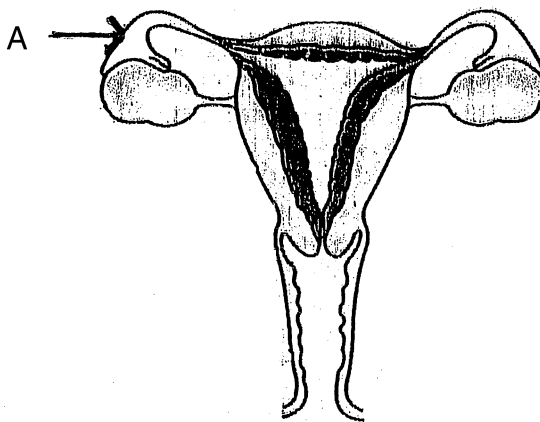


- ii) What could be the reason for adopting contraceptive methods ?
- iii) Write a point of difference between pollination and fertilization.
- iv) Name the following :
 - a) The terminal sticky part of the carpel.
 - b) The mode of reproduction in yeast.

OR

C) The modes by which organisms reproduce depend on the body design of the organisms. [4]

- i) Observe the diagram given below and answer the questions :

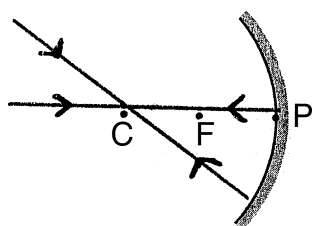


What is the role of the part marked 'A' ?

- ii) Why does menstruation occur ?
 - iii) Write a point of difference between a male gamete and a female gamete ?
 - iv) Name :
 - a) The organism in which binary fission occurs in definite orientation
 - b) The structure where spores are formed in rhizopus.
4. A) i) Select the correct alternative from those given below each statement and write the completed statement : [1]
- a) In Mendel's breeding crosses, F_2 generation was produced through _____
 - Cross breeding of F_1 individuals
 - Self pollination of F_1 individuals
 - Cross breeding one of individual and the parents
 - Self fertilization of one of all parent
 - b) In some animals like snails sex determination is regulated by _____
 - Male gamete
 - Both male and female gamete
 - Female gamete
 - Environmental cues



- ii) Name the following : [1]
- a) The energy produced due to the temperature difference in a sea level.
 - b) The residue left behind when wood is burnt in limited supply of air.
- iii) What factors could lead to the rise of new species ? [1]
- B) i) In spite of the high cost and low efficiency solar cells are used in many applications. [2]
- a) What is the range in voltage produced in a typical solar cell ?
 - b) Why are solar panels mounted on specially inclined rooftops ?
- ii) Answer the following : [2]
- a) Why do all gametes formed in females have only X chromosomes ?
 - b) Which process can be illustrated by the example of evolution of broccoli from wild cabbage ?
 - c) What will be the ratio in F_2 generation in Mendel's dihybrid cross ?
- iii) Observe the following diagram and answer the question given below : [1]




Explain why a ray of light passing through the centre of curvature of a concave mirror gets reflected back along the same path.

- iv) Why does the light ray incident in a rectangular glass slab emerge parallel to incident ray ? [1]
- C) Do as directed : [4]
- i) Draw a ray diagram to show the formation of an image when an object is placed between F and P of a concave mirror.
 - ii) A needle placed 45 cm from a convex lens, forms an image on a screen placed 90 cm on the other side of a lens. Determine its focal length. What is the size of the image if the object is 5 cm ?

OR

- C) Do as directed : [4]
- i) Draw a ray diagram to show the formation of an image when an object is placed between focus (F_1) and optical centre (O) of a convex lens.
 - ii) A concave mirror produces 3 times enlarged image of an object placed 10 cm in front of it. Calculate its radius of curvature.



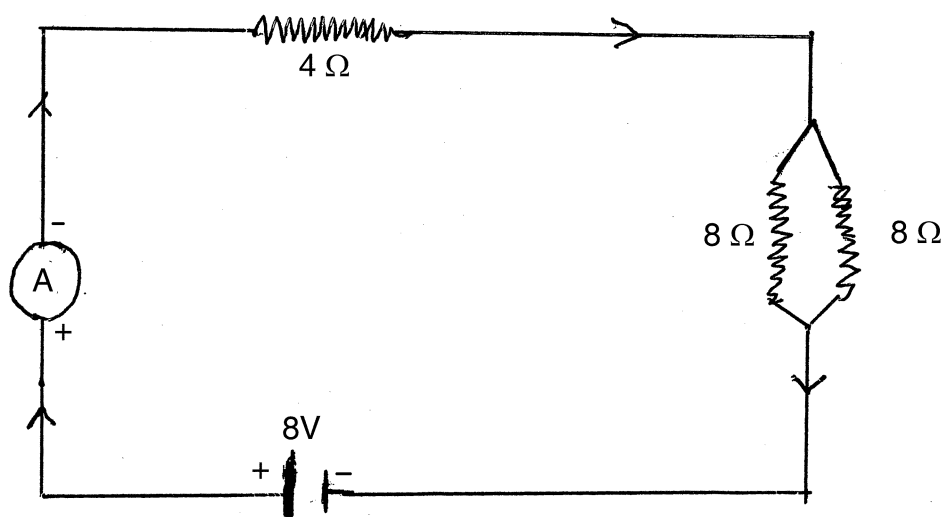
5. A) i) Select the correct alternative from those given below each statement and write the completed statement : [1]
- a) The part of eye that regulates and controls the amount of light entering the eye is _____
- Retina
 - Pupil
 - Iris
 - Cornea
- b) The phenomenon of scattering of light by colloidal particles is called _____
- Reflection
 - Refraction
 - Tyndal effect
 - Deflection
- ii) Observe the correlation in the first pair and complete the second pair : [1]
- a) $1 \text{ volt} = \frac{1 \text{ Joule}}{1 \text{ Coulomb}} :: 1 \text{ ohm} = \underline{\hspace{2cm}}$
- b) Resistor of resistance :  :: Rheostat : _____
- iii) Name two safety measures commonly used in domestic electric circuit and appliances. [1]
- iv) Answer the following : [1]
- a) Name the rule used to find the direction of induced current in a conductor moving in a magnetic field.
- b) What is the frequency of household alternating current (AC) in India ?
- B) Electricity and magnetism are linked to each other. [2]
- i) Why does a current carrying solenoid when suspended freely rest along a north south direction ?
- ii) Two fuse wires A and B of the same length but rated 20 A and 10 A respectively which will be more thicker and why ?
- C) Ramu's eye lens has an excessive curvature. [3]
- i) Where is the image of the distant object formed in Ramu's eyes ?
- ii) Bifocal lenses consists of concave and convex lenses respectively. Why ?
- iii) Why we cannot read a printed page by holding very close to our eyes ?

OR



- C) The human eye is one of the most valuable and sensitive sense organ. It enables us to see wonderful world of colors. [3]
- i) Why does the sky appear dark from the moon ?
 - ii) Write two effects of atmospheric refraction.
 - iii) Write a point of difference between dispersion and spectrum.

- D) Do as directed : [4]
- i) Draw a circuit diagram for verifying Ohm's law. Connect a resistor, an ammeter, a plug key, a battery and a voltmeter across the resistor. Show the direction of the flow of current.
 - ii) Find out the following from the electric circuit given below :



- a) Total resistance of resistors in the above combination.
- b) Amount of current flowing through the circuit.