

**CARMEL CONVENT SCHOOL**  
**SECOND UNIT EXAMINATION**  
**2023-2024**  
**SCIENCE**

**Class X**  
**Date: 08.12.23**

**MM: 40**  
**Time: 1hr30min**

**BIOLOGY (13)**

Instructions:

Questions 1 to 4 are objective and carry 1 mark each.

Question 5 is for 2 marks.

Question 6 is for 3 marks

Question 5 is CCT based, carries 4 marks

**MCQ's**

(4)

- ✓1. The basis of evolution in living organisms is
  - a. Replication of DNA
  - b. Creation of cellular apparatus
  - c. An inbuilt tendency for variation
  - d. Creation of new species
- ✓2. All plants produced through vegetative propagation are
  - a. Produced from seeds
  - b. Genetically similar
  - c. Genetically dissimilar
  - d. Produced from buds
- ✓3. Placenta is a special tissue
  - a. where the zygote is formed
  - b. Through which menstruation takes place
  - c. By which the foetus is attached to the uterus
  - d. The embryo gets nutrition from the mother's blood

**Assertion and Reasoning**

- a) If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.
- b) If both Assertion and Reason are true and the Reason is not the correct explanation of the Assertion.
- c) If Assertion is true but the Reason is false.

d) If both Assertion and Reason are false.

4. **Assertion:** Mendel successfully formulated the laws of heredity.

**Reason:** Mendel did not carry out the study of one character at a time.

### Subjective

Answer the following Questions:

5. In the following food chain, energy is transferred to the next trophic level. The flow of energy is shown below.

Plants → Grasshopper → Frog → Snake → Hawk

If 1J of energy is available to the hawk, then how much energy was present at the producer level? (2)

6. Draw a neat diagram of the female reproductive System and label the following:

a. The part through which the uterus opens into the vagina

b. The part where fertilization takes place

(3)

### CCT based

7. In garden peas, long stems are dominant to short stems, and yellow seeds are dominant to green seeds. 100 long/yellow pea plants, all of which had one short/green parent, are interbred (bred to each other). 1600 progeny result. Please answer the following questions about this progeny.

a. Assuming that these two genes are unlinked, how many long/green pea plants would you expect to find among the offspring?

b. What ratio of yellow to green seed color would you expect among the offspring?

c. What would you expect the overall phenotypic ratio among the 1600 offspring to be (taking into consideration both traits)?

(4)

## CHEMISTRY (13)

### GENERAL INSTRUCTIONS:

- Q1-6 are MCQ's carrying 1 mark each.
- Q7-9 are short answers carrying 2 marks each.
- Q10 is short answer carrying 3 marks each.
- All questions are compulsory.

Q1. Which of the following statements are correct for carbon compounds?

- Most carbon compounds are good conductors of electricity.
- Most carbon compounds are poor conductors of electricity.

(iii) Force of attraction between molecules of carbon compounds is not very strong.

(iv) Force of attraction between molecules of carbon compounds is very strong.

(a) (ii) and (iv)

(b) (ii) and (iii)

(c) (i) and (iv)

(d) (i) and (iii).

Q2.  $C_3H_8$  belongs to the homologous series of

(a) Alkynes

(b) Alkenes

(c) Alkanes

(d) Cyclo alkanes.

Q3. Name the functional group present in  $CH_3COCH_3$ .

(a) Alcohol

(b) Carboxylic acid

(c) Ketone

(d) Aldehyde

Q4. Addition reactions are undergone by

(a) Saturated Hydrocarbons (alkanes)

(b) Only alkenes

(c) Only alkynes

(d) Both alkenes and alkynes

Q5. Formation of black coating on the silver articles is due to the formation of

(a) Silver sulphide

(b) Silver iodide

(c) Silver Chloride

(d) Silver oxide

Q6. The compound  $C_5H_{12}$  has

- (a) 5 covalent bonds
- (b) 12 covalent bonds
- (c) 16 covalent bonds
- (d) 17 covalent bonds

Q7. Draw the electron dot structure of the following

- (a) Benzene
- (b) Ethane

Q8. Draw the structures for the following compounds

- (a) Hexanoic acid
- (b) 2,2 Dichloropentane

Q9. What is thermit reaction? How is it used to join the railway tracks or crack machine parts.

Q10. Draw the structural isomers of pentane and also write their IUPAC Names.

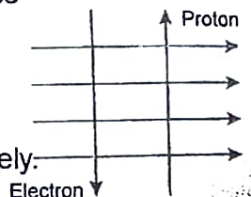
## PHYSICS (14)

MCQ

1

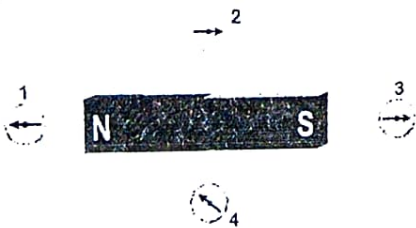
Q1. A uniform magnetic field exists in the plane of paper pointing from left to right as shown in figure. In the field, an electron and proton are shown. The electron and proton experience

- (a) forces both pointing into the plane of paper.
- (b) forces both pointing out of the plane of paper.
- (c) forces pointing into the plane of paper and out of the plane of paper respectively.
- (d) forces pointing opposite and along the direction of uniform magnetic field respectively.



Q2. The diagram shows plotting compasses around a bar magnet.

1



Which of the plotting compass needles are drawn pointing in the correct direction?

- (a) 1 and 2 only

- (b) 1 and 3 only
- (c) 1, 2 and 3 only
- (d) 4 only

Q3. How much more heat is produced, if current is doubled? 1

- (a) Four times the original amount.
- (b) Thrice the original amount.
- (c) Five times the original amount.
- (d) Twice the original amount.

The following questions consist of two statements--Assertion(A) and Reason(R). Answer these questions selecting the appropriate option given below:

- (a) Both A and R are true and R is the correct explanation for A.
- (b) Both A and R are true but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) A is false but R is true.

Q4. Assertion (A) : The strength of the magnetic field at the centre of a circular coil of a wire depends on the radius of the coil 1

Reason (R) : The strength of the magnetic field at the centre of a circular coil of a wire depends on the number of turns of the wire in the coil.

Q5. Assertion (A) : Strength of an electromagnet can be increased by decreasing the number of turns per unit length in solenoid coil. 1

Reason (R): Strength of an electromagnet can be increased by increasing the current flowing through the solenoid.

Q6. Assertion (A) : The resistivity of a substance does not depend on the nature of the substance and temperature. 1

Reason (R) : The resistivity of a substance is a characteristic property of the material.

Q7. Assertion (A) : The 200 W bulb glows with more brightness than 100 W bulb. 1

Reason (R) : A 100 W bulb has more resistance than 200 W bulb.

✓ Q8. When a 12 V battery is connected across an unknown resistor, there is a current of 2.5 mA in the circuit. Find the value of the resistance of the resistor. 2

✓ Q9. An electric bulb is rated 220 V and 100 W. Calculate the power consumed when it is operated on 110 V. 2

✓ Q10. Suppose your parents have constructed a two-room house and you want that in the living room there should be a provision of one electric bulb, one electric fan, a refrigerator and a plug point for appliances of power up to 2 kilowatts.

Draw a circuit diagram showing electric fuse and earthing as safety devices.

Give its advantages.

3

-----THE END-----