**Chapter 9**

**Heredity and Evolution**

**(Deleted topic- Basic concept of evolution)**

1. All the variations in a species do not have equal chances of survival, why?
2. What is genetics?
3. How is a homozygous organism different from heterozygous organism?
4. State any 2 properties due to which Mendel selected Pea plant.
5. Name the information source for making proteins in the cell.
6. How many pairs of allelic characters did Mendel study in pea plant?
7. How the creation of variations in a species promotes survival?
8. It is matter of chance whether a couple will have a male or female child, justify this statement by drawing flow chart.
9. Which type of organisms will have more variations- sexually or asexually reproducing organisms? Justify.
10. What type of progeny was obtained by Mendel in F1 and F2 generation when he crossed the tall and short plants? Write the ratio he obtained in F2generation.
11. How did Mendel experiments show that traits are inherited independently?
12. Distinguish between homologous and analogous organ.
13. Plant with round seed is crossed with plants with wrinkled seeds. All the F1 progenies are with round seeds.
14. What is the percentage of progeny with wrinkled seeds in F2generation?
15. What is the percentage of progeny of hybrid plants in F2generation?
16. Justify the above result by drawing Punnett square.
17. What is genetic drift? In which type of population genetic drift helps in evolution?
18. Is reproductive isolation must for speciation? Explain.
19. How are fossils formed? Describe in brief two methods of determining the age of fossil.
20. What are connecting links?
21. Explain how vestigial organs give us idea about evolution.
22. What are homologous structures? Give an example. Is it necessary that homologous structure have common ancestor
23. What is speciation? How is allopatric speciation different from sympatric speciation?
24. How did Mendel explain that it is possible that trait is inherited but not expressed in the organism?
25. A) Work out a cross up to F2 generation between two pure breed pea plants one bearing violet flowers and other white flowers.

B) a) Name this type of cross.

1. b) State the different laws of Mendel that can be derived from such a cross.
2. Why do all the gametes formed in Human female have an X-chromosome?
3. How is back cross different from reciprocal cross?
4. In a given population a trait A exists in 30% of population of a species and trait B exists in 70% of population. Which trait is likely to have arisen earlier
5. Explain the law of purity of gametes.
6. State law of dominance with example.
7. Plant with full green pod is said to be homozygous dominant. Plant with yellow pod is said to be homozygous recessive. Crossing of these two plants can also give rise to full yellow pod and plants with constricted green pods are also produced.
8. What conclusion could Mendel draw from this observation?
9. Work out cross up to F2 generation. For such type.
10. Genetic combinations of mothers play a significant role in determining the sex of new born, say yes or no and give reason for it.
11. Multiple choice questions
12. Which among the following is dominant trait studied by Mendel in a pea plant?
13. White flower b) Terminal flower c) Green pod colour
14. d)green seed colour
15. Human males are

a) homomorphic b) homogametic c) heterologous d) heteromorphic

1. The physical appearance of an individual is known as
2. Hetrotype b) genotype c) phenotype d) morphotype
3. Which one of Mendel law states that when two homozygous individual with one or more contrasting character are crossed, the characteristic that appear in F1 hybrids are dominant and those which do not are recessive?
4. Law of segregation b) Law of dominance c) Law of independent assortment d) none of the above.
5. Who is considered father of genetics?
6. Mendel b) Morgan c) Sutton d) Boveri
7. Assertion and Reasons
8. If both assertion and reason are true and reason is correct explanation of assertion.
9. If both assertion and reason are true but reason is not correct explanation of assertion.
10. If assertion is true but reason is false
11. If assertion is false but reason is true.
12. Assertion: Genetic variations are disadvantageous to a population.

Reason: Genetic variation enables an individual to adapt to the environment.

1. Assertion: Sex of a child is determined by father and not mother.

Reason: Father is heterogametic.

1. Assertion: All the offspring obtained in F1 generation are phenotypically and genotypically same.

Reason: Red flowered plant of F1generation is same as red-flowered plants of P generation.

1. Assertion: Test cross is a cross between individual of unknown genotype and recessive parent.

Reason: Back cross is a cross which involves the same trait but sexes are reversed to those in the original cross.

1. Assertion: A gamete may carry either of traits but not both.

Reason: Mendel’s law of independent assortment is based on purity of gametes.

**Chapter 10**

**Light- Reflection and Refraction**

1. What is a meant by linear magnification of a concave mirror?
2. In a concave mirror, is principal focus a real point? If yes, why?
3. The principal focus of a convex mirror lies at the back of the mirror. Comment.
4. What is the name of the phenomenon in which the right side of an object appears to be on left side of the image? Which kind of mirror is responsible for this?
5. A coin in the glass beaker appears to rise as the beaker is slowly filled with water. Why?
6. Refractive index of diamond with respect of glass is 1.6 and absolute refractive index of glass is 1.5. Find out the absolute refractive index of diamond.
7. The rear view mirror of a car is a plane mirror. A driver is reversing his car at the speed of 2m/s. The driver his rear view mirror, the image of a truck parked behind his car. Calculate the speed at which the image of truck seems to approach the driver.
8. An object 4 cm in height is placed at 15 cm in front of concave mirror of focal length 10 cm. At what distance from the mirror should a screen be placed to obtain a sharp image of object. Calculate the height of the image.
9. Draw a labelled ray diagram to show the path of reflected ray corresponding to an incident ray of light parallel to the principal axis of a convex mirror. Mark the angle of incidence and angle of reflection on it.
10. An object is placed at a distance of 15cm from a convex lens of focal length 20 cm. List 4 characteristics (nature, position etc) of the image formed by the lens.
11. A real image 2/3 the size of an object formed by convex lens when an object is at a distance of 12 cm from it. Find the focal length of the lens.
12. Read the given passage and answer the questions based on it.

A concave mirror forms image of an object thrice in its size on a screen. Magnification of the mirror gives information about the size of image relative to the object. Sign of magnification gives information about nature of the image produced by it.

1. Identify the correct option
2. Image must be real b) Image must be virtual c) Image may be virtual d) Transverse magnification, m=+3.
3. If the object is placed x distance from the pole of mirror. Then image distance is
4. v=--2x b) v= 3x c) v=2x d) v= -- 3x
5. If the radius of curvature of mirror is R. Then the correct relation is
6. 1/v+1/u =1/f b) 1/-3x+1/-x =1/R c) 1/3x+1/x= R/2 d) none of the above.
7. If the speed of light in vacuum is 3x108m/s. Find the absolute refractive index of a medium in which light travels with speed of 1.4 x108m/s.
8. For which position of the object does a convex lens form a virtual and erect image? Explain with help of ray diagram.
9. A convex lens of focal length 20 cm can produce magnified virtual as well as real image. Is this is correct statement? If yes where shall the objects be placed in each case for obtaining the images.
10. Two lenses of power –2.5D and 1.5 D are placed in contact. Find the total power of combination of lenses. Calculate the focal length of this combination.
11. State the laws of refraction of light. Explain the term absolute refractive index of a medium and write an expression to relate it with speed of light in vacuum.
12. A divergent lens has focal length of 20 cm. At what distance should an object of the lens be placed so that its image is formed 10 cm away from the lens. Find the size of image also.
13. A 4 cm tall object is placed perpendicular to principal axis of the convex lens of focal length 24cm. The distance of the object from the lens is 16 cm. Find the position, size and nature of image formed using the lens formula.
14. Distinguish between the following
15. Regular and Irregular reflection
16. Divergent and Convergent lens
17. Real and virtual Image
18. Multiple choice questions
19. The mirror used by a dentist to examine the teeth of a person is
20. Convex b) Concave c) plane d) any one of the above
21. A convex mirror used for rear view on an automobile has a radius of curvature of 3.00m. If a bus is located at 5.00m from this mirror. Find the magnification of bus

a).32 b)0.23 c) 0.87 d) 1.15

1. A ray passing through which part of lens emerges undeviated?
2. Focus b) Centre of curvature c) Optical centre d) between focus and centre of curvature
3. The focal length of 4 convex lens P,Q ,R,S are 20cm, 15cm, 5cm and 10cm respectively. The lens having greatest power is
4. P b) Q c) R d) S
5. Which is the correct statement related to concave mirror?
6. Outer surface is coated with opaque substance b) inner surface is polished and reflective c) is known as converging mirror d) is used to observe the phenomenon of refraction.
7. Assertion and Reasons
8. If both assertion and reasons are true and reason is correct explanation of assertion.
9. If both assertion and reason are true and reason is not correct explanation of assertion
10. If assertion is true but reason is false.
11. If assertion is false and reason is true.
12. Assertion: When concave mirror is held under water the focal length will remain unchanged.

Reason: The focal length of a concave mirror is independent of the medium in which it is placed.

1. Assertion: If the optical density of a substance is more than that of water then the mass density of substance can be less than water.

Reason: Optical density and mass density is not related.

1. Assertion: The image of a virtual object formed by a thin converging lens is always real.

Reason: In case of thin lens 1/v+1/u= 1/f

1. Assertion: In the case of concave mirror the minimum distance between real object and its real image is zero.

Reason: If the concave mirror forms virtual image of real object, the image is magnified.

1. Assertion: When ray of light is refracted from water to glass, its wavelength decreases while frequency does not change.

Reason: When a ray of light is refracted from water to glass , it bens towards normal.