**MASTERS PRE-UNIVERSITY COLLEGE, HASSAN 573201.**

**BIOLOGY PRACTICE QUESTIONS**

**Topic: Principles of Inheritance**

1. **When yellow and round heterozygous Pea plants are self fertilized, the frequency of occurrence of RrYY genotype among the offspring is**

a) 9/16 b) 2/16 c) 6/16 d) 1/16

1. **Test cross is a cross between**
   1. Hybrid X hybrid parent
   2. Hybrid into dominant parent
   3. Hybrid X recessive parent
   4. Two distantly related species
2. **Which one of the following conditions correctly describes the manner of determining the sex in the given example?**
   1. XO condition in humans as found in Turner Syndrome, determines female sex.
   2. Homozygous sex chromosomes (XX) produce male in Drosophila
   3. Homozygous sex chromosomes (ZZ) determine female sex in birds
   4. XO type of sex chromosomes determine male sex in Grasshoppers
3. **Which feature represents a recessive character in Mendel’s Pea plant**

a) Round seed b) Green pod

c) Red flower d) Yellow pod

1. **When the number of recombinant progeny is usually less than the number expected in independent assortment it is called**

a) complete linkage b) incomplete linkage

c) complete recombination d) incomplete recombination

1. **Mendel’s Law of independent assortment holds good for genes situated on the :**
   1. non-homologous chromosomes
   2. homologous chromosomes
   3. extra nuclear genetic element
   4. same chromosome
2. **ABO blood grouping is determined by three alleles. How many genotypes and phenotypes are possible?**

a. 3, 1 b. 6, 4 c. 4, 6 d. 2, 1

1. **Both husband and wife have normal vision though their fathers were color blind. The probability of their daughter becoming color blind is**

a.0% b. 25% c. 50% d. 75%

1. **A disease cause by an autosomal primary non-disjunction is**

a. Down’s syndrome b. Klinefelter’s syndrome

c. Turner’s syndrome d. sickle cell anemia

1. **Genes controlling seven characters in pea studied by Mendel were actually located on**

a. Seven chromosomes b. Six chromosomes c. Four chromosomes d. Five chromosomes

1. **Match the columns**

A. Monoploidy 1. 2n-1

B. Monosomy 2. 2n+1

C. Nullisomy 3. 2n+2

D. Trisomy 4. 2n-2

E. Tetrasomy 5. n

6. 3n

a. A-6, B-5, C-3, D-4, E-2 b. A-5, B-2, C-4, D-1, E-3

c. A-5, B-1, C-4, D-2, E- 3 d. A-1, B-5, C-3, D-2, E-4

1. **Heterochromatin region of DNA is**

a. Genetically more active b. genetically less active

c. loosely coiled region d. lightly coloured region

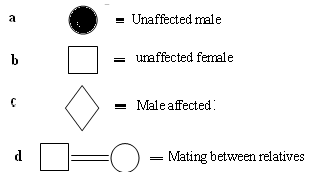
1. **A person affected with phenylketonuria lacks an enzyme that converts amino acid phenylalanine to**

a. Valine b. Tyrosine c. Methionine d. Proline

1. **The probability of the male child of a haemophilic father and normal mother becoming haemophilic is**

a.100% b.50% c. 0% d. 25%

1. **Which of the following symbols and its representation, used in human pedigree analysis is correct?**



1. **Select the correct statement from the ones given below with respect to dihybrid cross:**
   * 1. Tightly linked genes on the same chromosome show high recombinations
     2. genes far apart on the same chromosome show very few recombinations
     3. genes loosely linked on the same chromosome show similar recombinations
     4. tightly linked genes on the same chromosome show very few recombinations.
2. **The allele which is unable to express its effect in the presence of another is called**

a. codominant b. Supplementary c. Complementary d. recessive

1. **Haemophilia is more common in males because it is a**

a. recessive character carried by Y-chromosome b. dominant character carried by Y-chromosome

c. dominant trait carried by X-chromosome d. recessivetrait carried by X-chromosome

1. **Mendel was successful in discovering the principles of inheritance as**

a. He took Pea plants for his experiments

b. He was a famous mathematician

c. He did not encounter linkage between the genes for the characters he considered

d. He had an in depth knowledge on hybridization

1. **Sickle cell anemia patients are mostly resistant to which disease?**

a. Filaria b. Malaria c. Dengue d. Chicken pox

1. **If there is a complete linkage in F2 generation then**

a. Parental types and recombinants appear in equal ration

b. Recombinants are less than parental types

c. Recombinants are more than parental types

d. There will be only parental types

1. **Which pair of features represents polygenic inheritance?**

a. Human eye color and sickle cell anemia

b. Skin colour in mice and tongue rolling in humans

c. ABO blood groups in humans and flower colour in *Mirabilis jalapa*

d. Human height and skin colour

1. **In his experiments, Mendel obtained wrinkled pea. The wrinkling was due to deposition of sugar instead of starch. This happened due to**

a. Amylase enzyme

b. Invertase enzyme

c. diastase enzyme

d. Absence of starch-branching enzyme

1. **Cross between AaBB and aaBB will form**

a. 1AaBB : 1 aaBB b. All AaBB c. 1AaBB : 1aaBB d. 1AaBB : 3aaBB

1. **Sickle cell anemia is caused by substitution of**

a. Valine by glutamic acid at sixth position of α – chain of Hb

b. Valine by glutamic acid at sixth position of β – chain of Hb

c. Glutamic acid by valine at sixth position of α – chain of Hb

d. Glutamic acid by valine at sixth position of β – chain of Hb

1. **Which one is the incorrect statement with regard to the importance of pedigree analysis?**

a. It confirms that DNA is the carrier of genetic information

b. It helps to understand whether the trait in question is dominant and recessive

c. It confirms that the trait is linked to one of autosome

d. It helps to trace the inheritance of a specific trait

1. **In garden peas, round shape is dominant over wrinkled shape. A pea plant heterozygous for round shape of seed is selfed and 1600 seeds produced during the cross are subsequently germinated. How many offspring will have parental phenotype?**

a. 1600 b. 800 c. 400 d. 1200

1. **Identify the reasons correctly for Aneuploidy and Polyploidy.**

a. Aneuploidy is due to failure of segregation of chromosomes during cell division whereas polyploidy is due to failure of cytokinesis after telophase of cell division.

b. Aneuploidy is due to failure of cytokinesis after telophase of cell division whereas polyploidy is due to failure of segregation of chromosomes during cell division.

c. Aneuploidy and polyploidy both are due to failure of cytokinesis after telophase of cell division.

d. Aneuploidy and polyploidy both are due to failure of segregation of chromosomes during cell division

1. . **Independent assortment of genes does not take place when**

a. genes are located on homologous chromosome

b. genes are linked and located on the same chromosome

c. genes are located on non-homologous chromosome

d. all of the above.

1. **Mother and father of a person with ‘O’ blood group have ‘A’ and ‘B’ blood group respectively. What would be the genotype of both mother and father?**
2. Mother is homozygous for ‘A’ blood group and father is heterozygous for ‘B’
3. Mother is heterozygous for ‘A’ blood group and father is homozygous for ‘B’
4. Both mother and father are heterozygous for ’A’ and ‘B’ blood group, respectively
5. Both mother and father are homozygous for ‘A’ and ‘B’ blood group, respectively.