GENETICS
PRINCIPLES OF INHERITANCE AND VARIATION
Q. How many types of gametes are produced by individual having AaBbCc genotype?

1. One
2. Two
3. Four
4. Many
Q. Assortment or segregation of genes takes place during

1. Fertilization
2. Separation of gametes
3. Formation of gametes
4. Death of gametes
Q. In persons with sickle cell anaemia, the sixth amino acid, glutamic acid in $\beta$-chain of haemoglobin molecule is replaced by

1. Serine
2. Valine
3. Methionine
4. Phenylalanine
NORMAL β-GLOBIN

DNA ......................... TGA   GGA   CTC   CTC ............
mRNA ......................... ACU   CCU   GAG   GAG ............
Amino acid ................. thr   pro   glu   glu ..........

MUTANT β-GLOBIN

DNA ......................... TGA   GGA   CAC   CTC ............
mRNA ......................... ACU   CCU   GUG   CTC ............
Amino acid ................. thr   pro   val   glu ..........
Q. A woman with B blood group marries a man with AB blood group, which of the following blood group of children indicate that woman is heterozygous?

1. A
2. B
3. AB
4. O
Q. Which of the following is the chromosomal complement (genotype) of a person suffering from Klinefelter’s syndrome?

1. 44A+XXY  
2. 45A+XX  
3. 44A+XY  
4. 44A+XO
Q. A type of sugar produced by the gene I on the surface of RBC is

1. Agglutinogen
2. Agglutinin
3. Albumin
4. Globulin
Q. In a medico-legal problem of a family having four children with blood group A, B, O & AB respectively. Father is accepting first three children as his and rejecting last child by suspecting his wife, applied for divorce. The claim made by father is

1. Not valid
2. Valid
3. Can’t claim unless he knows the blood group of his wife
4. Data insufficient
Q. Which of the following phenotypic character is exhibited by Holandric genes?

1. Red-green colour blindness
2. Profuse bleeding
3. Cat-cry syndrome
4. Hypertrichosis
Q. Which of the following is correct combination?

1. Sickle cell anaemia - bleeder’s disease
2. Haemophilia - recessive X linked
3. Colour blindness - Y linked
4. Thalassaemia - dominant X linked
Q. Suppose if you marry a good looking person with blood group O, what is the possibility of homozygous blood group, of your child?

1. AB  
2. O  
3. A  
4. B
Q. An individual which is always true breeding is

1. Dominant
2. Hybrid
3. Heterozygous
4. Recessive
Q. A wild type is

1. A phenotype most commonly found in nature
2. The dominant allele
3. Your pet animal
4. Cultivated in garden
Q. In a breeding experiment $F_2$ generation has 200 offsprings, 50 of them are with genotype TT. The genotype of parental ($P_1$) generation must be

1. TT and tt  
2. Tt and tt  
3. Tt and Tt  
4. tt and tt
Q. The significance of test cross is to test

1. Heterozygosity of F₁ progeny
2. Heterozygosity of recessive parent
3. Homozygosity of recessive parent
4. Heterozygosity of F₂ parent
Q. Green blindness is

1. Protonopia
2. Deuteronomopia
3. Daltonism
4. Tritanopia
Q. Which of the following is gene disorder?

1. Klinefelter’s syndrome
2. Down’s syndrome
3. Turner’s syndrome
4. Sickle cell anaemia
Q. What is an offspring of two homozygous parents differing from one another by alleles at only one gene locus called?

1. Trihybrid
2. Dihybrid
3. Monohybrid
4. Back cross
Q. The genetic concept of segregation and recombination are most likely to be associated with

1. Meiosis and cleavage
2. Meiosis and mitosis
3. Meiosis and fertilization
4. Meiosis and amitosis
Q. Which of the following is not true?

1. Boys are haemophilic
2. Girls are carrier for haemophilia
3. Boys are carrier for haemophilia
4. Girls are haemophilic
Q. Which Mendelian law is applied when factor for each character segregate and pass on to each gamete uncontaminated?

1. Law of purity of gametes
2. Law of Independent assortment
3. Law of Unit characters
4. Law of Dominance
Q. If a tall plant is crossed with a dwarf one, about one half of the offspring produced are tall and the other half dwarf in $F_1$ generation. The genotype of parents is

1. Tt x tt
2. Tt x Tt
3. TT x tt
4. tt x tt
Q. In a cross TT × tt, what percentage of offspring will have the same genotype as their parents in F₁ generation?

1. 0 %
2. 25 %
3. 50 %
4. 100 %
Q. The genotype of blood group AB is

1. Homozygous and codominant
2. Heterozygous and codominant
3. Codominant only
4. Heterozygous and dominant
Q. What is the cause for a child born with an extra chromosome in each of its cells?

1. Segregation
2. Non-disjunction
3. Crossing over
4. Multiple sex
Q. The gene for haemophilia is located on X-chromosome. Hence it is normally impossible for a 

1. Haemophilic father to pass the gene to his daughter
2. Carrier mother to pass the gene to her daughter
3. Carrier mother to pass the gene to her son
4. Haemophilic father to pass gene to his son
• Unit of distance between genes in a chromosome is

1. Micron
2. Mendel
3. Centimorgan
4. Exon
Q. What is the probability of daughter born to a haemophilic mother and a colour blind father?

1. She is colour blind
2. She is haemophilic
3. She is haemophilic and colourblind
4. She is carrier for both
Q. If a man of blood group A\(^+\) in heterozygous marries a woman of blood gp B\(^+\) in heterozygous, their children can be of the blood group

1. A\(^+\), B\(^+\), AB\(^+\), O\(^+\)
2. A\(^+\), B\(^+\), AB\(^+\), O\(^+\) A\(^-\), B\(^-\), AB\(^-\), O\(^-\)
3. A\(^-\), B\(^-\), AB\(^-\), O\(^-\)
4. A\(^+\), B\(^+\), A\(^-\), B\(^-\)
Q. If the father is haemophiliac and mother is a carrier of the gene for haemophilia. What are the chance that their son will inherit the disease?

1. 0 %
2. 50 %
3. 75 %
4. 100 %
Q. Epicanthus condition is found in

1. Down’s syndrome
2. Klinefelter’s syndrome
3. Turner’s syndrome
4. Criminal syndrome
Q. The disease reported in queen Victoria is

1. Heamophilia-A
2. Christmas
3. Daltonism
4. Hepatitis-B
Q. Sickle-cell anaemia is due to the mutated gene \( \text{Hb}^s \) present on the chromosome

1. 11
2. 16
3. 21
4. 5
Q. Y-linked inheritance is from

1. Female to male
2. Male to female
3. Father to son
4. Female to female
Q. Barr-body is

1. Highly heterochromatinised X-chromosome in male
2. Highly heterochromatinised X-chromosome in female
3. Barbels in cats
4. Y-chromosome in female
Q. Linked genes separate due to

1. Crossing over
2. Mutation
3. Recombination
4. Feratilization
Q. Children born to colour blind woman and normal vision man are

1. All are colour blind

2. Daughters are colour blind and sons are normal

3. Sons are colour blind and daughters are normal

4. Sons are colour blind and daughters are carriers
Q. Criss-cross inheritance is between

1. Male to male
2. Female to female
3. Opposite sex
4. Father to mother
Q. The blood group AB was reported by

1. Carl Landsteiner
2. Steiner and Weiner
3. de Castella and Steini
4. Burnstein
Q. Which of the following are phenocopies with respect to length of pea plant?

1. TT, Tt, tt
2. TT, tt
3. TT, Tt
4. Tt, Tt
Q. Hollandric characters are

1. Albinism
2. Icthyocis
3. Porcupine disorder
4. Icthyocis & Porcupine disorder
Q. Hemophilia was reported by

1. Allec Jeffrey
2. John Cotto
3. Carl Correns
4. Elizabeth
Q. Hemizygous condition is applicable to

1. XX
2. XY
3. XXY
4. XO
Q. Skin color inheritance in man is an example for

1. Sex linked
2. Pleiotropic
3. Polygenic
4. Multiple allele
Q. The rarest blood group is

1. A
2. B
3. AB
4. O
Q. The rediscoverers of mendelian principles are

1. de Vries
2. Correns and Mendel
3. Tschermak
4. de Vries, Correns, Tschermak
Q. Phenotypic ratio of dihybrid test cross is

1. 1 : 1
2. 1 : 1 : 1 : 1
3. 9 : 3 : 3 : 1
4. 1 : 2 : 2 : 4 : 1 : 2 : 1 : 2 : 1
Q. Which of the following is more likely to be heterozygous?

1. Pure lines
2. Self-pollinated crops
3. Autopolyploids
4. Cross-pollinated crops
Q. If the cell of an organism heterozygous for alleles Xx, Yy undergoes meiosis, then the possible genotype of gametes will be

1. XY, xY, Xy, xy
2. XY, xy
3. Xx, Yy
4. XxYy
Q. If two heterozygous dihybrids are crossed, the percentage of recessive is

1. 25%
2. 06%
3. 75%
4. 50%
Q. The significance in using a Punnet square is to know

1. gametic combinations
2. genotypic ratios
3. phenotypic ratios
4. all genotypic & phenotypic ratios
Q. Chromosome theory of heredity was postulated by

1. Charles Darwin
2. Gregor Mendel
3. Sutton and Boveri
4. Morgan
THANK YOU