**Eklavya Batch**

**Test on Understanding and Self Study**

**Class VIII**

**FM 30**

**Case Study: A researcher is studying a cell line that is defective in protein secretion. The cells are accumulating proteins in the endoplasmic reticulum (ER).**

**MCQs:**

**1. Which organelle is primarily responsible for protein folding and modification in the cell?**

**a) Mitochondria**

**b) Endoplasmic reticulum (ER)**

**c) Golgi apparatus**

**d) Lysosome**

**2. Which cell organelle is involved in packaging and shipping proteins to other parts of the cell or for secretion?**

**a) Endoplasmic reticulum (ER)**

**b) Golgi apparatus**

**c) Lysosome**

**d) Peroxisome**

**3. The accumulation of proteins in the ER is likely due to a defect in which process?**

**a) Protein synthesis**

**b) Protein folding**

**c) Protein transport from ER to Golgi**

**d) Protein degradation**

**4. Which organelle is responsible for degrading and recycling cellular waste and proteins?**

**a) Lysosome**

**b) Peroxisome**

**c) Mitochondria**

**d) Endoplasmic reticulum (ER)**

**5. What is the likely fate of the accumulated proteins in the ER?**

**a) They will be secreted normally**

**b) They will be degraded by the proteasome**

**c) They will be transported to the Golgi apparatus**

**d) They will accumulate in the cytoplasm**

**6. What is the primary mechanism by which the endoplasmic reticulum (ER) ensures proper protein folding?**

**a) Hydrolysis of ATP**

**b) Binding of chaperone proteins**

**c) Oxidation of cysteine residues**

**d) Phosphorylation of serine residues**

**7. What is the primary function of the cell membrane?**

**a) To regulate cell growth**

**b) To synthesize proteins**

**c) To control movement of materials in and out of the cell**

**d) To store genetic information**

**8. Which organelle is involved in lipid synthesis?**

**a) Endoplasmic reticulum**

**b) Golgi apparatus**

**c) Lysosome**

**d) Peroxisome**

**9. Which cell organelle contains digestive enzymes?**

**a) Lysosome**

**b) Peroxisome**

**c) Mitochondria**

**d) Endoplasmic reticulum**

**10. What is the function of the cytoskeleton?**

**a) To provide structural support**

**b) To synthesize proteins**

**c) To regulate cell growth**

**d) To store genetic information**

**11. Which organelle is responsible for detoxification?**

**a) Mitochondria**

**b) Endoplasmic reticulum**

**c) Peroxisome**

**d) Lysosome**

**12. What is the primary function of ribosomes?**

**a) To synthesize proteins**

**b) To store genetic information**

**c) To regulate cell growth**

**d) To control movement of materials**

**12. Which organelle is involved in the breakdown of fatty acids?**

**a) Mitochondria**

**b) Peroxisome**

**c) Endoplasmic reticulum**

**d) Lysosome**

**13. What is the function of the nuclear envelope?**

**a) To regulate cell growth**

**b) To synthesize proteins**

**c) To control movement of materials in and out of the nucleus**

**d) To store genetic information**

**14. What is the primary function of the cell wall?**

**a) To regulate cell growth**

**b) To provide structural support**

**c) To synthesize proteins**

**d) To control movement of materials**

**15. What is the function of the centrioles?**

**a) To synthesize proteins**

**b) To regulate cell growth**

**c) To form cilia and flagella**

**d) To store genetic information**

**16. Which organelle is responsible for storing genetic information?**

**a) Nucleus**

**b) Mitochondria**

**c) Endoplasmic reticulum**

**d) Lysosome**

**17. What is the primary function of the plasma membrane?**

**a) To regulate cell growth**

**b) To synthesize proteins**

**c) To control movement of materials in and out of the cell**

**d) To store genetic information**

**18. What is the function of the microtubules?**

**a) To provide structural support**

**b) To synthesize proteins**

**c) To regulate cell growth**

**d) To store genetic information**

**19. Which organelle is responsible for the synthesis of steroids?**

**a) Endoplasmic reticulum**

**b) Golgi apparatus**

**c) Lysosome**

**d) Mitochondria**

**20. What is the primary function of the nucleolus?**

**a) To synthesize proteins**

**b) To regulate cell growth**

**c) To store genetic information**

**d) To synthesize ribosomal RNA**

**21. Draw a properly labelled diagram of animal cell with 8 proper labelling. (2+8)**

**Class IX**

**Eklavya Batch**

**Test on Understanding and Self Study**

**1. What is the law of segregation?**

**a) Alleles of a gene are combined in the offspring**

**b) Alleles of a gene are separated during gamete formation**

**c) Alleles of a gene are expressed equally**

**d) Alleles of a gene are not expressed**

**2. What is the phenotype of an individual with the genotype "Rr" if R is dominant and r is recessive?**

**a) R**

**b) r**

**c) Rr**

**d) Neither R nor r**

**3. What is incomplete dominance?**

**a) When one allele is completely dominant over the other**

**b) When one allele is partially dominant over the other**

**c) When both alleles are expressed equally**

**d) When neither allele is expressed**

**4. What is the phenotype of an individual with the genotype "RW" if R and W show incomplete dominance?**

**a) Red**

**b) White**

**c) Pink**

**d) Both Red and White**

**5. What is co-dominance?**

**a) When one allele is completely dominant over the other**

**b) When one allele is partially dominant over the other**

**c) When both alleles are expressed equally**

**d) When neither allele is expressed**

**6. What is the phenotype of an individual with the genotype "AB" if A and B are co-dominant alleles?**

**a) A**

**b) B**

**c) AB**

**d) Neither A nor B**

**7. A cross between a red flower (RR) and a white flower (rr) produces pink flowers (Rr). This is an example of:**

**a) Complete dominance**

**b) Incomplete dominance**

**c) Co-dominance**

**d) Epistasis**

**8. A person with the genotype "IAIB" has AB blood type. This is an example of:**

**a) Complete dominance**

**b) Incomplete dominance**

**c) Co-dominance**

**d) Epistasis**

**9. What is the expected phenotypic ratio of offspring from a cross between two heterozygous parents (Rr x Rr) if R is dominant and r is recessive?**

**a) 1:1**

**b) 3:1**

**c) 1:2:1**

**d) 2:1:1**

**10. A cross between a tall plant (Tt) and a short plant (tt) produces 50% tall and 50% short offspring. This is an example of:**

**a) Complete dominance**

**b) Incomplete dominance**

**c) Co-dominance**

**d) Test cross**

**11. What is the genotype of an individual that is homozygous dominant for a trait?**

**a) RR**

**b) Rr**

**c) rr**

**d) R**

**12. A person with the genotype "IAi" has A blood type. This is an example of:**

**a) Complete dominance**

**b) Incomplete dominance**

**c) Co-dominance**

**d) Multiple alleles**

**13. What is the expected genotypic ratio of offspring from a cross between two heterozygous parents (Rr x Rr)?**

**a) 1:1**

**b) 1:2:1**

**c) 3:1**

**d) 2:1:1**

**14. A cross between a red flower (RR) and a pink flower (Rr) produces 50% red and 50% pink offspring. This is an example of:**

**a) Complete dominance**

**b) Incomplete dominance**

**c) Co-dominance**

**d) Test cross**

**15. What is the term for the genetic makeup of an individual?**

**a) Phenotype**

**b) Genotype**

**c) Allele**

**d) Trait**

**16. A person with the genotype "ii" has O blood type. This is an example of:**

**a) Complete dominance**

**b) Incomplete dominance**

**c) Co-dominance**

**d) Recessive allele**

**17. What is the expected phenotypic ratio of offspring from a cross between a homozygous dominant parent (RR) and a homozygous recessive parent (rr)?**

**a) 1:1**

**b) 3:1**

**c) 1:2:1**

**d) All Rr**

**18. A cross between two parents with the genotype "Rr" produces offspring with the genotypes RR, Rr, and rr. This is an example of:**

**a) Complete dominance**

**b) Incomplete dominance**

**c) Co-dominance**

**d) Segregation of alleles**

**19. If a heterozygous tall pea plant (Tt) is crossed with another heterozygous tall pea plant (Tt), what is the probability of obtaining a dwarf plant (tt) in the F2 generation?**

**A) 0%**

**B) 25%**

**C) 50%**

**D) 75%**

**20. A heterozygous yellow-seeded pea plant (Yy - dominant) is crossed with a green-seeded plant (yy - recessive). What percentage of the offspring will have green seeds?**

**A) 25%**

**B) 50%**

**C) 75%**

**D) 100%**

**21. Elaborate the Mendelian monohybrid cross with proper notations. 5**

**22. Elaborate the co-dominance effect of human blood group explaining how it works. 5**