

## CUET MCQ Questions from UNIT 2 (1)

### 1. What is the main principle of Mendelian inheritance?

- A. Genes are transmitted from parents to offspring
- B. Traits are determined by environmental factors
- C. DNA replication occurs during reproduction
- D. Chromosomes do not participate in inheritance

### 2. In incomplete dominance, the phenotype of the offspring is:

- A. Dominant
- B. Recessive
- C. Intermediate between the two parents
- D. Identical to the parent with dominant traits

### 3. What type of inheritance involves blood groups in humans?

- A. Polygenic inheritance
- B. Co-dominance and multiple alleles
- C. Incomplete dominance
- D. Chromosomal inheritance

### 4. Which genetic condition is sex-linked?

- A. Down's syndrome
- B. Colour blindness
- C. Turner's syndrome
- D. Klinefelter's syndrome

### 5. What is the chromosomal makeup of Turner's syndrome?

- A. XXY
- B. XO
- C. XXX
- D. XY

### 6. What is pleiotropy?

- A. One gene affecting multiple traits
- B. Multiple genes affecting one trait

- C. A mutation in a single gene
- D. Genes located on the same chromosome

**7. In humans, sex determination depends on:**

- A. The X chromosome only
- B. The Y chromosome
- C. Autosomes
- D. The mother's genetic makeup

**8. Which process involves the exchange of genetic material between homologous chromosomes?**

- A. DNA replication
- B. Crossing over
- C. Translation
- D. Transcription

**9. Haemophilia is an example of:**

- A. Autosomal recessive inheritance
- B. Sex-linked recessive inheritance
- C. Autosomal dominant inheritance
- D. Polygenic inheritance

**10. Which Mendelian disorder results in defective hemoglobin?**

- A. Down's syndrome
- B. Thalassemia
- C. Klinefelter's syndrome
- D. Haemophilia

**Molecular Basis of Inheritance**

**11. The structure of DNA was proposed by:**

- A. Watson and Crick
- B. Mendel
- C. Darwin
- D. Franklin and Wilkins

**12. What is the process of copying DNA into mRNA called?**

- A. Translation
- B. Transcription
- C. Replication
- D. Crossing over

**13. What is the central dogma of molecular biology?**

- A. RNA → DNA → Protein
- B. DNA → RNA → Protein
- C. Protein → RNA → DNA
- D. RNA → Protein → DNA

**14. Which operon model explains gene regulation in prokaryotes?**

- A. Trp operon
- B. Lac operon
- C. Operon complex
- D. Chromosome theory

**15. What is the repeating unit of DNA called?**

- A. Amino acid
- B. Nucleotide
- C. Protein
- D. Chromosome

**16. Which enzyme is responsible for DNA replication?**

- A. DNA ligase
- B. DNA polymerase
- C. RNA polymerase
- D. Helicase

**17. What is the full form of RNA?**

- A. Ribose Nucleotide Acid
- B. Ribo Nucleic Acid
- C. Ribo Nucleoprotein Acid
- D. Ribonucleic Acid

**18. DNA fingerprinting is widely used in:**

- A. Cloning
- B. Forensic science
- C. Genetic engineering
- D. Agriculture

**19. The human genome project aimed to:**

- A. Sequence all human DNA
- B. Modify genes in humans
- C. Study genetic disorders
- D. Cure diseases like cancer

**20. What is the main role of tRNA in translation?**

- A. Synthesizing proteins
- B. Transporting amino acids to ribosomes
- C. Replicating DNA
- D. Storing genetic information

**21. Darwin proposed the theory of:**

- A. Natural selection
- B. Mutation
- C. Gene flow
- D. Genetic drift

**22. The first form of life on Earth is thought to be:**

- A. Multicellular organisms
- B. Unicellular prokaryotes
- C. Plants
- D. Vertebrates

**23. Comparative anatomy provides evidence for evolution through:**

- A. Homologous structures
- B. Similar ecosystems

- C. Random mutations
- D. Natural selection

**24. Which evolutionary mechanism is caused by random changes in gene frequency?**

- A. Natural selection
- B. Genetic drift
- C. Adaptive radiation
- D. Gene flow

**25. What does Hardy-Weinberg's principle explain?**

- A. Evolutionary mechanisms
- B. Stability of gene frequencies in a population
- C. Speciation
- D. Natural selection

**26. Adaptive radiation refers to:**

- A. Random mutations in species
- B. Evolution of different species from a common ancestor
- C. Genetic drift in isolated populations
- D. Cross-species hybridization

**27. Human evolution is best evidenced by:**

- A. Genetic mutations
- B. Fossil records
- C. Adaptive radiation
- D. Recombination

**28. What is the main cause of genetic variation?**

- A. Gene flow and recombination
- B. Genetic drift
- C. Stabilizing selection
- D. Natural disasters

**29. What type of selection favors individuals with average traits?**

- A. Directional selection
- B. Stabilizing selection
- C. Disruptive selection
- D. Random selection

**30. Molecular evidence for evolution is provided by:**

- A. Homologous structures
- B. Similarities in DNA and protein sequences
- C. Fossils
- D. Comparative embryology

**31. What was Mendel's primary experimental organism?**

- A. *Drosophila melanogaster*
- B. *Pisum sativum*
- C. *Zea mays*
- D. *Arabidopsis thaliana*

**32. In incomplete dominance, the phenotype of the heterozygote is:**

- A. Identical to one of the parents
- B. A blend of both parents' phenotypes
- C. Completely different from both parents
- D. Similar to the dominant allele

**33. Co-dominance occurs when:**

- A. Both alleles are expressed equally in the phenotype
- B. One allele masks the other
- C. A single allele influences multiple traits
- D. Neither allele is expressed

**34. Which blood group is an example of multiple alleles?**

- A. A
- B. AB
- C. O
- D. All of the above

**35. A single gene influencing multiple traits is termed as:**

- A. Polygenic inheritance
- B. Pleiotropy
- C. Incomplete dominance
- D. Linkage

**36. The chromosome theory of inheritance was proposed by:**

- A. Mendel
- B. Watson and Crick
- C. Sutton and Boveri
- D. Morgan

**37. Which sex determination system is observed in birds?**

- A. XX-XY
- B. ZZ-ZW
- C. XO-XX
- D. Haplodiploidy

**38. Haemophilia is an example of:**

- A. Autosomal inheritance
- B. Sex-linked recessive inheritance
- C. Co-dominance
- D. Polygenic inheritance

**39. Down's syndrome is caused by:**

- A. Mutation in the sex chromosome
- B. Trisomy of chromosome 21
- C. Deletion in chromosome 5
- D. Extra X chromosome

**40. Which disorder is characterized by a 44 + XO chromosome complement?**

- A. Klinefelter's syndrome
- B. Turner's syndrome
- C. Down's syndrome
- D. Patau's syndrome.

**41. The search for genetic material led to the conclusion that DNA is the genetic material based on:**

- A. Mendel's experiments
- B. Griffith's transformation experiment
- C. Hershey and Chase experiment
- D. Both B and C

**42. DNA replication is described as:**

- A. Conservative
- B. Semi-conservative
- C. Dispersive
- D. None of the above

**43. Transcription is the process of:**

- A. DNA replication
- B. RNA synthesis from DNA
- C. Protein synthesis from RNA
- D. Gene splicing

**44. Which codon is a start codon in translation?**

- A. UGA
- B. AUG
- C. UAA
- D. UAG

**45. The lac operon is an example of:**

- A. Positive gene regulation
- B. Negative gene regulation
- C. Co-dominance
- D. Epistasis

**46. What was the main goal of the Human Genome Project?**

- A. Identify all human proteins
- B. Map all human genes and sequences

- C. Discover new genetic disorders
- D. Develop gene therapy methods

**47. DNA fingerprinting is based on:**

- A. Chromosome structure
- B. DNA sequence variations
- C. Protein synthesis
- D. RNA interference.

**48. Who proposed the Modern Synthetic Theory of Evolution?**

- A. Charles Darwin
- B. Watson and Crick
- C. Dobzhansky, Haldane, and others
- D. Mendel

**49. Adaptive radiation is best explained by the evolution of:**

- A. Darwin's finches
- B. Homo sapiens
- C. Neanderthals
- D. Chimpanzees

**50. Mutation and recombination contribute to:**

- A. Genetic drift
- B. Variation in a population
- C. Gene flow
- D. Bottleneck effect

## CUET MCQ Questions from UNIT 2 (1)

- 1. Hardy-Weinberg equilibrium predicts:**
  - A. Constant allele frequencies in large populations
  - B. Increasing mutations over generations
  - C. Evolutionary changes in small populations
  - D. The origin of life
  
- 2. The theory of natural selection was proposed by:**
  - A. Alfred Wallace
  - B. Charles Darwin
  - C. Gregor Mendel
  - D. Both A and B
  
- 3. Fossil evidence for evolution is provided by:**
  - A. Biogeography
  - B. Comparative anatomy
  - C. Paleontology
  - D. Embryology
  
- 4. Which type of natural selection favors intermediate traits?**
  - A. Stabilizing selection
  - B. Disruptive selection
  - C. Directional selection
  - D. Sexual selection
  
- 5. Gene flow involves:**
  - A. Migration of genes between populations
  - B. Reduction of genetic diversity
  - C. Random changes in allele frequencies
  - D. Complete isolation of populations
  
- 6. The bottleneck effect leads to:**
  - A. Increased genetic diversity
  - B. Decreased genetic diversity

- C. Adaptive radiation
- D. High mutation rates

**7. Homologous structures indicate:**

- A. Common ancestry
- B. Similar environmental pressures
- C. Genetic drift
- D. Mutations

**8. The molecular clock hypothesis is based on:**

- A. DNA replication
- B. Constant mutation rates
- C. Natural selection
- D. Gene flow

**9. Comparative embryology supports evolution by showing:**

- A. Similar development patterns in related organisms
- B. Fossil evidence of common ancestors
- C. Convergent evolution
- D. Adaptive radiation

**10. The oldest hominid species belongs to the genus:**

- A. Homo
- B. Australopithecus
- C. Ardipithecus
- D. Pan

**11. Which of the following best describes incomplete dominance?**

- A. Both alleles express equally in the phenotype
- B. Dominant allele completely masks the recessive allele
- C. Phenotype is an intermediate of the parental traits
- D. Alleles exist in multiple forms in a population

**12. Which blood group system demonstrates codominance?**

- A. ABO
- B. Rh factor

- C. MN blood group
- D. H antigen

**13. Which disorder is an example of a Mendelian disorder?**

- A. Down's syndrome
- B. Thalassemia
- C. Turner's syndrome
- D. Klinefelter's syndrome

**14. What genetic mechanism explains linked genes often being inherited together?**

- A. Independent assortment
- B. Recombination
- C. Linkage
- D. Mutation

**15. The sex of honeybees is determined by:**

- A. X-Y system
- B. Haplodiploidy
- C. Z-W system
- D. Environmental factor.

**16. Which is NOT a sex-linked disorder?**

- A. Haemophilia
- B. Colour blindness
- C. Down's syndrome
- D. Duchenne muscular dystrophy

**17. Turner's syndrome is characterized by which chromosomal pattern?**

- A. 46, XXY
- B. 45, XO
- C. 47, XXY
- D. 46, XY

**18. Which of the following explains pleiotropy?**

- A. One gene affects multiple phenotypic traits
- B. Multiple genes control a single trait

- C. Genes located on the same chromosome
- D. Independent expression of alleles

**19. What mechanism underlies genetic recombination?**

- A. Mutation
- B. Independent assortment
- C. Crossing over
- D. Gene flow

**20. Which experiment proved DNA is the genetic material?**

- A. Griffith's experiment
- B. Hershey and Chase experiment
- C. Meselson and Stahl experiment
- D. Beadle and Tatum experiment

**21. DNA replication occurs during which phase of the cell cycle?**

- A. G1 phase
- B. S phase
- C. G2 phase
- D. M phase

**22. What is the role of helicase in DNA replication?**

- A. Joining Okazaki fragments
- B. Synthesizing RNA primers
- C. Unwinding the DNA double helix
- D. Proofreading DNA strands

**23. Which region of a gene is not transcribed into RNA?**

- A. Exon
- B. Intron
- C. Promoter
- D. Coding sequence

**24. The lac operon is an example of:**

- A. Positive regulation only
- B. Negative regulation only

- C. Both positive and negative regulation
- D. Post-transcriptional regulation

**25. Which enzyme catalyzes the formation of mRNA?**

- A. DNA polymerase
- B. RNA polymerase
- C. Ligase
- D. Helicase.

**26. What type of evidence supports Darwin's theory of evolution?**

- A. Morphological evidence only
- B. Molecular evidence only
- C. Fossil, morphological, and molecular evidence
- D. Fossil evidence only

**27. Who proposed the Modern Synthetic Theory of Evolution?**

- A. Charles Darwin
- B. Gregor Mendel
- C. Dobzhansky, Mayr, and Fisher
- D. Lamarck

**28. Genetic drift has a greater effect on:**

- A. Large populations
- B. Small populations
- C. Migratory populations
- D. Stationary populations

**29. Which process results in new alleles in a population?**

- A. Genetic drift
- B. Mutation
- C. Gene flow
- D. Natural selection

**30. What does the Hardy-Weinberg principle describe?**

- A. Evolutionary mechanism in small populations

- B. Genetic equilibrium in a population
- C. The role of natural selection in evolution
- D. Adaptive radiation in species

**31. Adaptive radiation occurs due to:**

- A. Genetic drift
- B. Mutation
- C. Availability of new ecological niches
- D. Geographic isolation

**32. Which scientist provided molecular evidence for evolution?**

- A. Charles Darwin
- B. Alfred Wallace
- C. Linus Pauling
- D. Watson and Crick

**33. The finches of the Galápagos Islands provide evidence for:**

- A. Genetic drift
- B. Artificial selection
- C. Natural selection
- D. Gene flow

**34. Human evolution involved the first appearance of:**

- A. Homo sapiens
- B. Homo erectus
- C. Australopithecus
- D. Homo habilis

**35. Which is NOT an example of polygenic inheritance?**

- A. Skin color
- B. Height
- C. Blood type
- D. Eye color

- 36. The genetic code is said to be degenerate because:**
- A. It contains stop codons
  - B. Multiple codons code for the same amino acid
  - C. It has specific start codons
  - D. It is universal across organisms
- 37. What type of selection favors individuals with average traits?**
- A. Disruptive selection
  - B. Stabilizing selection
  - C. Directional selection
  - D. Sexual selection
- 38. What is the role of ribosomes in translation?**
- A. Synthesize tRNA
  - B. Decode mRNA to synthesize proteins
  - C. Copy DNA into RNA
  - D. Splice introns from pre-mRNA
- 39. In the human genome project, what percentage of the human genome codes for proteins?**
- A. 2%
  - B. 50%
  - C. 98%
  - D. 100%
- 40. In Down's syndrome, how many total chromosomes are present?**
- A. 45
  - B. 46
  - C. 47
  - D. 48.
- 41. Which of the following is an example of incomplete dominance?**
- A. ABO blood group inheritance
  - B. Red, pink, and white flowers in snapdragon plants
  - C. Sickle cell anemia
  - D. Color blindness

**42. What are multiple alleles?**

- A. Two different genes controlling a single trait
- B. More than two alternative forms of a gene in a population
- C. Linked genes inherited together
- D. Genes located on sex chromosomes

**43. Which chromosomal disorder is characterized by a genotype of 47 chromosomes, including an extra chromosome 21?**

- A. Turner's syndrome
- B. Down's syndrome
- C. Klinefelter's syndrome
- D. Haemophilia

**44. In honeybees, sex determination is based on:**

- A. Temperature
- B. Haplodiploidy
- C. Presence of Y chromosome
- D. Hormonal differences

**45. What is the central dogma of molecular biology?**

- A. DNA → RNA → Protein
- B. RNA → DNA → Protein
- C. DNA → Protein → RNA
- D. Protein → RNA → DNA

**46. The structural unit of DNA is known as a:**

- A. Chromatid
- B. Nucleotide
- C. Ribosome
- D. Operon

**47. What is the significance of the Hardy-Weinberg principle?**

- A. It explains the formation of new species
- B. It measures evolutionary changes in a population

- C. It predicts allele and genotype frequencies in a non-evolving population
- D. It describes the mechanism of natural selection

**48. Which of the following is an example of co-dominance?**

- A. Pink flowers in snapdragons
- B. ABO blood group inheritance (AB blood type)
- C. Sickle cell anemia
- D. Colour blindness

**49. Which genetic material experiment provided evidence that DNA is the hereditary material?**

- A. Hershey-Chase experiment
- B. Griffith's transformation experiment
- C. Meselson-Stahl experiment
- D. Watson-Crick model

**50. Which type of natural selection favors individuals with extreme phenotypes at both ends of a trait distribution?**

- A. Stabilizing selection
- B. Disruptive selection
- C. Directional selection
- D. Artificial selection