

**Department of Biological Sciences**  
**MPhil Molecular Pathology & Genomics (Evening Program)**  
**Admission Test Sample Paper**



**Duration: 60 minutes**

**Questions: 50**

**Total Marks: 50**

**Student Name** : \_\_\_\_\_

**Serial No /Admission ID** : \_\_\_\_\_

**Instructions:** This paper comprises of 50 multiple choice questions. You have to choose one best answer for each of the multiple choice questions asked. Kindly encircle the correct answer. Overwriting is not allowed and will not be marked. Each Question carries equal marks.

**1. What would be a likely explanation for existence of pseudogenes?**

- a) Gene duplication
- b) Gene duplication and mutation events
- c) Mutation events
- d) Unequal crossing over

**2. The human genome contains approximately \_\_\_\_\_.**

- a) 6 billion base pairs
- b) 5 billion base pairs
- c) 3 billion base pairs
- d) 4 billion base pairs

**3. Approximately what proportion of the human genome is made up of repetitive DNA sequences?**

- a) 1%
- b) 15%
- c) 50%
- d) 90%

**4. The effectors of gene silencing are short double-stranded RNA molecules produced by the action of the enzyme dicer. Approximately what size are these molecules?**

- a) 11 bp
- b) 22 bp
- c) 75 bp
- d) 100 bp

**5. Suppose a certain gene contains the double-stranded sequence:**

5'- ATGTTTAGCGCC -3'

3'- TACAAATCGCGG -5'

If the top strand is the sense strand and codes for a mRNA whose sequence begins 'ATG'. Which of the following would be the sequence of the corresponding segment of antisense RNA?

- a) 5'-AUGUUUAGCGCC-3'
- b) 5'-CCGCGAUUUGUA-3'
- c) 5'-UACAAAUCGCGG-3'
- d) 5'-GGCGCUAAACAU-3'

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**6. Which of the following is true of RNA synthesis (transcription)?**

- a) RNA synthesis is always in the 5' - 3' direction
- b) RNA polymerase needs a primer to initiate transcription.
- c) In transcription, U is inserted opposite T.
- d) new nucleotides are added on to the 2' OH of the ribose sugar.

**7. Which of the following statements is correct, according to Chargaff's rules?**

- a) All DNA molecules contain the same proportions of A, C, G and T.
- b) Single-stranded RNA molecules contain the same amount of A and U.
- c) In double-stranded DNA, the amount of T equals the amount of C.
- d) In double-stranded DNA, the amount of G equals the amount of C.

**8. Which of the following does NOT contain phosphate?**

- a) A nucleoside
- b) A nucleotide
- c) DNA
- d) RNA

**9. If a mother is diagnosed with a mitochondrial gene disorder, pattern of inheritance will be**

- a) All her sons will be affected
- b) All her sons will be carriers
- c) All her daughters will be affected
- d) 50% of all her children will be affected

**10. Which of the following is a single gene disorder?**

- a) Huntington's disease
- b) Turner syndrome
- c) Graves' disease
- d) Alzheimer's disease

**11. \_\_\_\_\_ is the largest out of 46 chromosomes.**

- a) Chromosome X
- b) Chromosome 21
- c) Chromosome 1
- d) Philadelphia chromosome

**12. Extrachromosomal inheritance involves genes that are passed on by the mother's \_\_\_\_\_**

- a) Cytoplasm
- b) Oocyte
- c) Mitochondria
- d) Ribosomes