Roll No. .....

D–1030

M. A./M. Sc. (Fourth Semester) (Main/ATKT)

EXAMINATION, 2020

ANTHROPOLOGY

(Group—A : Physical Anthropology)

Paper First

(Medical Genetics)

Time : Three Hours] [*Maximum Marks : 80*

Note : Attempt all Sections as directed.

Section—A 1 each

(Objective/Multiple Choice Questions)

Note : Attempt all questions.

Choose the correct answer :

1. Medical geneticists usually abbreviate the normal beta-globin gene as *b*, and the abnormal gene (in this case) as *b*°. Neither of your patient's parents has beta-thalassemia. Which of these described the most likely genotypes of both parents ?

   (a) One is *b*° and one is *b*

   (b) One is *b*°*b*° and one is *bb*

   (c) Both are *b*°*b*°

   (d) Both are *bb*°

2. In the human blood system, the alleles A and B are dominant to O. What will be the number of different possible genotype ?

   (a) 4

   (b) 6

   (c) 8

   (d) 12

3. According to classical genetics, which of the following statements is true ?

   (a) Recessive alleles are detected by the phenotype of the F_1 generation.

   (b) The closer two genes are, the more frequently they recombine.

   (c) Genes on different autosomes segregate independently.

   (d) Gene on sex chromosomes segregate with the same pattern as autosomal genes.

4. When a man with hypertrichosis marries a normal woman, what percentage of their sons would be expected to have hairy ears ?

   (a) 0%

(b) 25%

(c) 50%

(d) 100%

5. Cystic fibrosis is a hereditary disease that affects the respiratory and digestive systems. Cystic fibrosis occurs when two recessive genes (cc) are present. A person with one allele for cystic fibrosis is called a carrier (Cc) of the disease. If the mother is a carrier of the disease and the father is homozygous dominant, what are chances that their child will be a carrier of cystic fibrosis ?

(a) 25%

(b) 50%

(c) 75%

(d) 100%

6. A man with a certain disease marries a normal woman. They have 8 children (4 boys and 4 girls); all of the girls have their father's disease, but none of the boys do. What inheritance is suggested ?

(a) Autosomal recessive

(b) Autosomal dominant

(c) Y-linked

(d) X-linked

7. A person with Klinefelter syndrome is considered a :

(a) Monosomic

(b) Triploid

(c) Trisomic

(d) Deletion heterozygote

8. Diagnosis of chromosome aneuploidy of unborn children is normally done by a combination of amniocentesis, cell culture and :

(a) Karyotyping

(b) Enzyme assay

(c) RFLP analysis

(d) Pedigree analysis

9. If a colurblind man marries a normal woman then all the sons will be :

(a) Normal

(b) Partially colourblind

(c) Colourblind

(d) Carrier

10. Which of the following shows autosomal dominant inheritance ?

(a) Cystic fibrosis

(b) Albinism

(c) Haemophilia

(d) Polydactyly

11. Which of the following is an example of inborn error of metabolism ?

(a) Achondroplasia

(b) Colourblindness

(c) Phenylketoneuria

(d) Cystic fibrosis

12. Turner's syndrome is a case of :

(a) G^{+}

(b) XO

(c) XXY

(d) XXXY

13. Polymerase Chain Reaction (PCR) is an :

(a) In-vitro technique

(b) In-vivo technique

(c) Chemical technique

(d) Electrophoretic technique

14. The first disease treated by gene therapy is :

(a) Hypothyroidism

(b) Cancer

(c) Cardio-vascular disease

(d) An immunodeficiency disease

15. Approximately what percentage of human genome contains protein coding genes ?

(a) ~ 2%

(b) ~ 20%

(c) ~ 50%

(d) ~ 80%

16. The prevent hemolytic disease of the newborn from occurring in a successive pregnancy where an Rh negative woman gives birth to an Rh positive child, the child will receive shortly after birth an injection of :

(a) Rh antigens

(b) A and B factors

(c) Rh antibodies

(d) Type O blood

17. Serological tests are used in diagnostic microbiology to detect :

(a) The presence of antigens or antibodies in blood

(b) Whether bacterial flagella are present or absent

(c) Whether the serum of an

(d) Whether protozoa and fungi have invaded the tissues of the body

18. Which of the following diseases is not an autoimmune disease ?

(a) Rhematoid arthritis

(b) Lupus erythematosis

(c) Bovine spongiform encephalitis

(d) Grave's disease

19. The form of diabetes curable by insulin injection is :

    (a) Insulin dependent diabetes mellitus

    (b) Diabetes rugosa

    (c) Insulin independent diabetes mellitus

    (d) None of the above

20. Which of the following is an X-linked recessive disorder ?

    (a) Epiloia

    (b) Muscular dystrophy

    (c) Cancer

    (d) None of the above

Section—B 2 each

(Very Short Answer Type Questions)

Note : Attempt all questions.

1. Write relevance of studying 'Medical Genetics'.
2. What are Twins ? Name different types of Twins.
3. What is the difference between polydactyly, syndactyly and brachydactyly.
4. Describe characteristic features of nail-patella syndrome.
5. What is 'Karyotype' ?
6. Write name of *two* books of medical/clinical genetics.
7. Explain 'cretinism'.
8. Explain 'the central dogma.'

Section—C 3 each

(Short Answer Type Questions)

Note : Attempt all questions.

1. What is single gene defect ?
2. What are ethical principles in medical genetics ?
3. Why family history is important for analysis of genetic disorder ?
4. Write techniques of chromosome analysis.
5. Explain G-banding method of chromosome analysis.
6. Describe clinical features of Tay-Sachs disease.
7. Write the steps of genetic counselling.
8. Explain genetics of haemophilia.

Section—D 5 each

(Long Answer Type Questions)

Note : Attempt all questions.

1. Write in detail clinical features and genetics of Duchenne muscular dystrophy.
2. Write down the clinical symptoms and heredity mechanism of rheumatoid arthritis.
3. Write a brief essay on congenital heart disease.
4. Describe any *one* method of identification of genetic disease.