R1018	Sub. Code
	508201

M.Sc. DEGREE EXAMINATION, APRIL – 2024

Second Semester

Biomedical Science

MEDICAL GENETICS

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option

1. Which Mendelian ideals depicted by a cross in which the F1 generation resembles both the parents? (CO1, K2)

   (a) Incomplete dominance

   (b) Law of dominance

   (c) Inheritance of one gene

   (d) Co-dominance

2. Hemophilic person marries a girl having no history of the disease in her pedigree. What is the chance that a haemophilic child is born to them? (CO2, K4)

   (a) 0% (b) 25%

   (c) 50% (d) 75%

3. A human female with Turner's syndrome (CO2, K4)

(a) Has one additional X chromosome

(b) Exhibits male characters

(c) Is able to produce children with normal husband

(d) Has 45 chromosomes with XO

4. The diagram which shows the arrangement of metaphasic chromosomes according to their position of centromere is called ————————. (CO2, K4)

(a) Histogram (b) Karyogram

(c) Dendrogram (d) Ideogram

5. Which of the following human diseases is least likely to be caused by aneuploidy? (CO3, K4)

(a) Down syndrome

(b) Fragile X syndrome

(c) Turner syndrome

(d) Klinefelter syndrome

6. Maple syrup urine disease (MSUD) is caused by a genetically determined inability to break down: (CO3, K4)

(a) Sucrose

(b) Fructose

(c) Phenylalanine

(d) Branched-chain amino acids

7. Inborn error metabolism is the following except: (CO3, K4)

(a) Phenylketonuria

(b) Cystic Fibrosis

(c) Turner syndrome

(d) Tay Sachs Disease

8. Which blood tests can tell if a person is a thalassemia carrier? (CO4, K2)

(a) Complete Blood Count (CBC)

(b) Prenatal Testing

(c) Reticulocyte Counts

(d) All the above

9. Which of the following disorder is an example of point mutation? (CO5, K5)

(a) Sickle cell anaemia

(b) Down's syndrome

(c) Night blindness

(d) Thalassemia

10. Cystic fibrosis is an autosomal recessive genetic disorder. What are the chances that the child would have the disease if any one of the parents (either mother or father) is a carrier of the faulty cystic fibrosis gene (Cc)? (CO5, K5)

(a) 100 per (b) 50 per cent

(c) 25 per cent (d) 0 per cent

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) In the Meselson-Stahl DNA replication experiment, what percent of the DNA was composed of one light strand and one heavy strand after one generation of growth in ^{14}N containing growth media?

(i) 0

(ii) 25

(iii) 50

(iv) 75

(v) 100

Justify the answer. (CO1, K2)

Or

(b) Explain Mendel's law of independent assortment with suitable example. (CO1, K2)

12. (a) Give an account on morphological variability of Human Chromosomes. (CO2, K4)

Or

(b) Describe in detail about Haemophilia? Mention the cause, phenotype, the mode of inheritance and molecular defect in hemophilia. (CO2, K4)

13. (a) Explain, in which condition Maple syrup urine disease is inherited? Write a short note on its cause and types. (CO3, K4)

Or

(b) Write a short note on : (CO3, K4)

(i) Pharmacodynamics

(ii) Eco genetics.

14. (a) What is HbA1c and how to diagnose the metabolic disorders? (CO5, K2)

Or

(b) Give the list of factors to consider for evaluating the cancer genetic susceptibility syndrome. (CO5, K2)

15. (a) Briefly describe the autosomal recessive mode of inheritance, and molecular defect in sickle cell anemia. (CO5, K5)

Or

(b) Describe the abnormal haemoglobin synthesis and explain about alpha globin gene mutation. (CO5, K5)

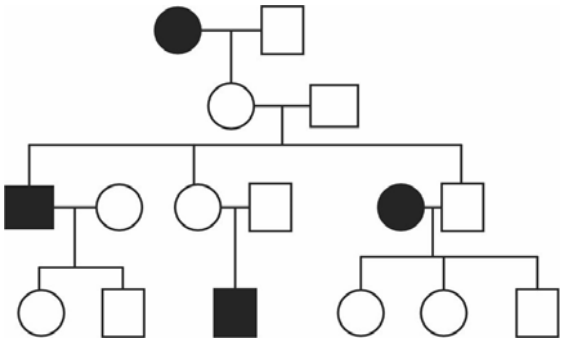
Part C ($5 \times 8 = 40$)

Answer **all** questions not more than 1000 words each.

16. (a) What were Mendel's key ideas about inheritance? (CO1, K2)

Or

(b) What does the below pedigree conclude? Explain the condition with any disorder related to it. (CO1, K2)



17. (a) Give a brief account on chromosomal aberrations. (CO2, K4)

Or

(b) Write short note on any two of the following; (CO2, K4)

(i) Karyotyping

(ii) Sex linked inheritance

(iii) Muscular dystrophy

(iv) Numerical aberration

18. (a) What is Albinism? Which is the hormone involved in this abnormality and Write is role in the pathophysiology of Albinism. (CO3, K4)

Or

(b) Explain with example on the effect of polymorphisms in genes encoding drug transporters. (CO3, K4)

19. (a) What is the pathogenesis of essential hypertension? Explain about high blood pressure is a high-risk factor for coronary disease. (CO4, K2)

Or

(b) Briefly explain why loss-of-function mutations are often recessive and why gain-of- function mutations are often dominant. (CO4, K2)

20. (a) Briefly describe about inheritance pattern of Cystic fibrosis and detail the Molecular Genetics of CFTR gene. (CO5, K5)

Or

(b) Describe about Heteroplasmy and evaluation strategies to identify the genetic cause of a mitochondrial disorder in a proband. (CO5, K5)

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R1019

Sub. Code
508202

M.Sc. DEGREE EXAMINATION, APRIL – 2024

Second Semester

Biomedical Sciences

PHARMACOLOGY

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. Drugs administered through the following route are most likely to be subjected to first-pass metabolism: (CO1, K2)

   (a) Oral (b) Intravenous

   (c) Subcutaneous (d) Rectal

2. The most commonly occurring conjugation reaction for drugs and their metabolites is (CO1, K2)

   (a) Acetylation (b) Methylation

   (c) Glucuronidation (d) Sumoylation

3. Drug cumulation is the basis of organ toxicity of the following drug when used for prolonged periods (CO2, K4)

   (a) Prednisolone (b) Chloroquine

   (c) Aspirin (d) Hydralazine

4. The following is a competitive type of enzyme inhibitor (CO2, K4)

   (a) Acetazolamide (b) Disulfiram

   (c) Physostigmine (d) Theophylline

5. The use of molecular docking and molecular dynamics comes under (CO3, K4)

(a) *in vivo* (b) *in vitro*

(c) *in silico* (d) *in ovo*

6. The clinical trial conducted to determine the effectiveness of an experimental drug on a particular disease or condition in approximately 100 to 300 volunteers (CO3, K4)

(a) Phase I (b) Phase II

(c) Phase III (d) Phase IV

7. What is full form of MedDRA (CO4, K2)

(a) Medical Dictionary for Regulatory Activities

(b) Medical Directorate for Regulatory Action

(c) Medical Device for Regulatory Action

(d) Medical Dictionary for Rehabilitation Activities

8. The identification and collection of information regarding drugs after their approval for use in a population? (CO4, K2)

(a) Clinical trial IV

(b) Pharmacogenomics

(c) Postmarketing surveillance

(d) Toxicological evaluation

9. What is the method of killing that minimizes pain and distress of experimental animals (CO5, K5)

(a) Euphoria (b) Euthanasia

(c) Analgesia (d) Anaesthesia

10. GMP does not ensures which of the following parameter (CO5, K5)

(a) Quality (b) Safety

(c) Efficacy (d) Cost

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Write in detail about the factors that modify the dose of a drug. (CO1, K2)

Or

(b) Explain the types of drug receptors. (CO1, K2)

12. (a) Explain about α-adrenergic blocking drugs and its uses. (CO2, K4)

Or

(b) Classify general anaesthetics and give brief account on Isoflurane. (CO2, K4)

13. (a) Write a note on *in silico* platforms and its role in drug discovery. (CO3, K4)

Or

(b) Write a note on transgenic animal models in development of new drugs. (CO3, K4)

14. (a) Discuss about the process of management of adverse drug reactions. (CO4, K2)

Or

(b) Write a note on MedDRA and PSUR. (CO4, K2)

15. (a) Explain about animal handling and animal care methods. (CO5, K5)

Or

(b) Discuss the duties of the Animal Ethical Committee. (CO5, K5)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Define Bioavailability. Describe the physiological and drug-related factors which affect the absorption and bioavailability. (CO1, K2)

Or

(b) Describe the kinetics of elimination. (CO2, K4)

17. (a) Classify Anticholinergic drugs. Discuss on pharmacological action, adverse effects and uses of Atropine. (CO3, K4)

Or

(b) Classify the drugs used for the treatment of Parkinsonism. Discuss on mechanism of action, pharmacological action and adverse effects of levodopa. (CO3, K4)

18. (a) Explain the drug discovery process in detail. (CO3, K4)

Or

(b) Discuss various phases of clinical trials in detail. (CO3, K4)

19. (a) Write the importance of ADR/ADE. (CO4, K2)

Or

(b) Explain about WHO international drug monitoring programme. (CO4, K2)

20. (a) Discuss the guidelines of CPCSEA for the performance of experiments on animals. (CO5, K5)

Or

(b) Highlight the Importance of the Drugs and Cosmetic Act. (CO5, K5)

R1020

Sub. Code
508503

M.Sc. DEGREE EXAMINATION, APRIL – 2024

Second Semester

Biomedical Science

Elective — FORENSIC SCIENCE

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. The study of decomposition of human body is known as (CO1, K2)

   (a) Forensic biology

   (b) Forensic pathology

   (c) Forensic toxicology

   (d) Forensic chemistry

2. The study of fire arms and ammunition is known as (CO3, K4)

   (a) Forensic Entomology

   (b) Forensic Ballistics

   (c) Forensic anthropology

   (d) Forensic Chemistry

3. Father of DNA finger printing is (CO4, K2)

(a) Alec Jeffreys

(b) H.J. Khorana

(c) Kary Mullis

(d) William Harvey

4. BEOSP stands for (CO4, K2)

(a) Brain electric Oscillate Sign profile

(b) Brain Electrical Oscillation Signature proficiency

(c) Brain Electron Oscillation Signal proficiency

(d) Brain Electrical Oscillation Signal proficiency

5. The concept of principle of exchange was proposed by (CO1, K2)

(a) Calvin Goddard

(b) Edmond Locard

(c) Albert Osborn

(d) Kart Landsteiner

6. The Indian Penal Code was framed in (CO1, K2)

(a) 1890 (b) 1860

(c) 1945 (d) 1956

7. The scene of occurrence is located from the following includes. (CO2, K4

(a) Presence of Corpus delicti

(b) Marks of struggle

(c) Abandoned articles

(d) All of the above

8. The phosphatase method is used to identify which body fluid? (CO3, K4)

(a) Blood (b) Saliva

(c) Semen (d) Urine

9. The basic principle in seized computer should remain (CO2, K2)

(a) as is as was (b) as it as was

(c) as was as now (d) as now as was

10. The subtle psychosomatic changes include all except (CO5, K5)

(a) Blood pressure

(b) Pulse rate

(c) Subsonic vocal cords vibration

(d) Perspiration

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Write in detail about the tools and techniques used in forensic science. (CO1, K2)

Or

(b) Outline the major Forensic Science Institutions. (CO1, K2)

12. (a) Explain the various types of Crimes. (CO2, K4)

Or

(b) Discuss Crime scene Management. (CO2, K4)

13. (a) Write a note on DNA finger printing. (CO4, K4)

Or

(b) Write a note classification of Narcotics. (CO4, K4)

14. (a) Discuss forensic process of Seizure of cell phone. (CO4, K2)

Or

(b) Write a note on Evaluation of voice analysis. (CO4, K3)

15. (a) Enumerate the scientific collection of Physical evidence. (CO2, K4)

Or

(b) Discuss the duties of Forensic Scientist. (CO3, K4)

Part C (5 × 8 = 40)

Answer **all** questions not more that 1000 words each.

16. (a) Write in detail about the history and development of Forensic Science. (CO1, K2)

Or

(b) Describe the various crime Scene Procedures. (CO2, K4)

17. (a) Discuss Forensic Ballistics and its application. (CO3, K4)

Or

(b) Give an elaborate evaluation of Body fluids. (CO3, K4)

18. (a) Explain the classification of cybercrimes in India. (CO2, K4)

Or

(b) Discuss various concepts of Psychology. (CO5, K5)

19. (a) Narrate the role of Forensic expert in handling Foraged documents. (CO3, K3)

Or

(b) Explain Narco analysis. (CO4, K2)

20. (a) Discuss crime scene management in Natural disaster. (CO2, K4)

Or

(b) Explain the application and Importance of Polygraph. (CO4, K2)

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