**R5987**

| Sub. Code |
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| 508101 |

**M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021**

**First Semester**

**Biomedical Science**

**ANATOMY AND PHYSIOLOGY**

**(CBCS – 2019 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Energy synthesis takes place in cell organelle is

   (a) Ribosomes (b) Mitochondria

   (c) Golgi bodies (d) Nucleus

2. Blood cell synthesis take place in organs of

   (a) Spleen (b) Pancrease

   (c) Bone marrow (d) Liver

3. Unit of blood pressure is

   (a) Mm/hg (b) cm/hg

   (c) Hh/hg (d) None of the above

4. Functional unit of nervous system is

   (a) neuton (b) nephron

   (c) alveolus (d) None of the above

5. The normal value of the intrapleural pressure in breathing are

(a) 8/2mmHg (b) 6/2mmHg

(c) 10/2mmHg (d) None of the above

6. The pH of pancreatic juice is

(a) 8.0 (b) 7.0

(c) 9.0 (d) 10.0

7. The pH of semen is

(a) 7.0 (b) 7.5

(c) 8.0 (d) 8.5

8. The female sex hormone is

(a) Estrogen (b) Progesterone

(c) Androgen (d) Both (a) and (b)

9. Functional unit of kidney is

(a) Neuton (b) Nephron

(c) Alveolus (d) None of the above

10. The frequency of sound audible to human ear lies between

(a) 2 and 20Hz (b) 20 and 20000Hz

(c) 2 and 200Hz (d) 20 and 200Hz

## Part B

$(5 \times 5 = 25)$

Answer **all** questions choosing either (a) or (b).

11. (a) Explain the function of Mitochondria with neat diagram.

Or

(b) Describe the characteristics of embryonic tissue.

12. (a) Write a short note on feed back control of blood pressure.

Or

(b) Briefly illustrate the parts of central nervous system.

13. (a) Explain various parts involved during respiration.

Or

(b) Write short notes on various enzymes involved in digestion.

14. (a) Explain the regulation of hormone receptors in female reproductive system.

Or

(b) Write a short note on regulation of spermatogenesis.

15. (a) Explain the structure of nephron with schematic diagram.

Or

(b) Explain the structure of taste bud with neat diagram.

**Part C** (3 × 10 = 30)

Answer any **three** questions.

16. Describe in detail about different models of plasma membrane with suitable diagram.

17. Define synapse. Explain the structure, function and properties of synapse.

18. Describe in detail about the physiology of digestion and absorption.

19. Explain the structure of ovary. Add a note on estrogen hormone for ovulation.

20. Draw the structure of ear and explain the mechanism of hearing.

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| R5988 | Sub. Code 508102 |
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**M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021**

**First Semester**

**Biomedical Science**

**MEDICAL GENETICS**

**(CBCS – 2019 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Dominant gene express in ———— generation

   (a) FO generation (b) f1 generation

   (c) f2 generation (d) f3 generation

2. The importance of test cross is to determine the progeny is are

   (a) Homozygous dominant

   (b) heterozygous dominant

   (c) Homozygous recessive

   (d) All the above

3. Sex of the individual is determined by

   (a) X chromosome (b) Y chromosome

   (c) Z chromosome (d) Both (a) and (b)

4. Hemophilia B is caused by the failure of protein factor

   (a) Factor VIII (b) Factor V

   (c) Factor VI (d) Factor IX

5. PKU is the disease of

(a) metabolic disorder

(b) genetic disorder

(c) heriditory disorder

(d) infectious disease

6. Drug is metabolized in

(a) Stomach (b) liver

(c) intestine (d) pancrease

7. Agglutination is ———— reaction.

(a) chemical reaction

(b) antigen-antibody reaction

(c) physical reaction

(d) both (a) and (c)

8. The characteristics of hypoglycemia in blood is

(a) High glucose

(b) Low glucose

(c) Low glycogen

(d) None of the above

9. Sickle cell anaemia is express under the condition of

(a) Homozygous recessive

(b) Homozygous dominant

(c) Heterozygous condition

(d) Both (a) and (b)

10. The main function of hemoglobin is

(a) Carry $CO_2$ (b) Carry $O_2$

(c) $H_2$ (d) $H_2O$

## Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) What is an allele? Explain the allele concept.

Or

(b) Explain the significance of pedigree analysis in genetics.

12. (a) Explain the methods of chromosome analysis. Add a note on its importance.

Or

(b) Write the gene responsible for colour blindness. Add a note on its characteristics.

13. (a) Explain the various disorders of lipid metabolism with suitable examples.

Or

(b) Explain the biotransformation of drugs with suitable examples.

14. (a) Explain the pathophysiology of hypertension. Add a note on its symptoms.

Or

(b) Write the characteristics of type 1 diabetes mellitus.

15. (a) Explain the different classes of gene mutations iin humans.

Or

(b) What is Marfan syndrome? Outline the pathophysiology disorders of Marfan syndrome.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Narrate the presentation of molecular genetic data in pedigrees to identify family history.

17. What is chromosomal abberration? Explain the various types of abberrations.

18. What is pharmacogenetics? Explain the pharmacogenomic analysis using animal models for any one diseases.

19. Explain the principles , mechanism, causes and symptoms of Alzheimer disease.

20. Explain in detail about pathogenesis and causes of inherited cardiomyopathy.

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| R5989 |
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| Sub. Code |
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| 508103 |

**M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021**

**First Semester**

**Biomedical Science**

**BIOINSTRUMENTATION AND ANALYTICAL CHEMISTRY**

**(CBCS – 2019 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

All questions carry equal marks.

1. _____ are devices which convert one form of energy into another.

   (a) transducers (b) electrodes

   (c) impulses (d) opamp

2. Source of Bioelectric potential is _____ in nature.

   (a) electronic (b) electric

   (c) ionic (d) mechanical

3. How many wavelengths are used by Pulse Oximeter?

   (a) 1 (b) 2

   (c) 3 (d) 4

4. How is the blood flow in arteries and arterioles?

(a) plug (b) laminar

(c) parabolic (d) pulsatile

5. What factors has no significant influence on the measurement?

(a) skin pigmentation

(b) thickness

(c) tissue

(d) skin pigmentation, thickness and tissue

6. Law obeyed by Pulse Oximeter is _____

(a) Lambert-Bouguer law

(b) Beer's law

(c) Beer-Lambert law

(d) Lamber-Bouguer, Beer's and Beer-Lambert Law

7. In 500 x g, what does g represent in accordance to centrifugation?

(a) Gravitational force

(b) Centrifugal force is 500 times greater than earthly gravitational force

(c) Centrifugal force is 500 times less than earthly gravitational force

(d) Centrifugal force is 500 times same as that of earthly gravitational force

8. Electrophoresis was developed by:

(a) Tswett (b) Tsvedberg

(c) Tiselius (d) Sanger

9. Which of the following acts as ionising gas in Geiger Muller counter?

(a) Alcohol (b) Argon gas

(c) Krypton (d) Hydrogen

10. Biosensors measure glucose concentrations between which of the following ranges?

(a) $10^{-1}$ to $10^{-2}$ M

(b) $10^{-2}$ to $10^{-4}$ M

(c) $10^{-1}$ to $10^{-4}$ M

(d) $10^{-1}$ to $10^{-7}$ M

**Part B** ($5 \times 5 = 25$)

Answer **all** questions choosing either (a) or (b).

11. (a) Comment on polarization effects of electrodes.

Or

(b) List out the benefits of biomedical electrodes.

12. (a) Discuss about Einthoven's triangle.

Or

(b) List out the importance of electromyography.

13. (a) Why bioamplifier is important? Discuss.

Or

(b) Narrate the applications of band pass filters.

14. (a) Comment on electromagnetic method used for blood flow measurement.

Or

(b) Highlight the consequences of oscillometric measurement of blood.

15. (a) State the principle and applications of X-ray diffraction.

Or

(b) List out the principle and applications of biosensors.

**Part C** (3 × 10 = 30)

Answer any **three** questions.

16. Write a detailed account on the biopotential of electrodes used in biomedical instrumentation.

17. What is biosignal? Briefly discuss the Characteristics and uses of biosignals.

18. Write an essay on isolated DC and AC carrier amplifiers.

19. With a neat sketch, discuss the different circuits applied in pressure amplifiers.

20. Describe the principle, process and applications of various centrifugation techniques used in biomedical field.

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**R5990**

| Sub. Code |
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| 508104 |

**M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021**

**First Semester**

**Biomedical Sciences**

**INTRODUCTION TO BIOINFORMATICS**

**(CBCS – 2019 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Which command is used to print a file in Linux operating system

   (a) print (b) ptr

   (c) lpr (d) none of the mentioned

2. The first line in any shell script begins with a ———— in UNIX.

   (a) & (b) !

   (c) $ (d) #

3. When did Smith–Waterman first describe the algorithm for local alignment?

   (a) 1950 (b) 1970

   (c) 1981 (d) 1925

4. When did Needleman-Wunsch first describe the algorithm for global alignment?

   (a) 1899 (b) 1970

   (c) 1930 (d) 1950

5. Which of the following is incorrect about ENTREZ?

(a) It is a resource prepared only by the staff of the National Center for Biotechnology Information

(b) It provides a series of forms that can be filled out to retrieve a Medline reference related to the molecular biology sequence databases

(c) One straightforward way to access the sequence databases is through ENTREZ

(d) It provides a series of forms that can be filled out to retrieve a DNA or protein sequence

6. Knowing _____ should be enough to find the required entry quickly.

(a) publication date, protein name, journal name

(b) accession number, protein name, or name of gene

(c) publication date, protein name, or volume

(d) properties, protein name, or title word

7. Isomerism that arises out of the difference in spatial arrangement of atoms or groups about the doubly bonded carbon atoms are called? (In specific)

(a) Structural Isomerism

(b) Stereo Isomerism

(c) Geometrical Isomerism

(d) Optical Isomerism

8. Telemedicine allows hospitals to optimize the use of their personnel by

(a) allowing outside specialists to view patient x-rays

(b) cross training doctors, nurses and maintenance workers

(c) allowing them to take more vacation days

(d) outsourcing all possible work

9. Telemedicine is the use of medical information exchange from one site to another via

(a) print communication

(b) written communication

(c) electronic communication

(d) verbal communication

10. The word which means decrease in size of a normally developed organ is ————————.

(a) atrophic (b) ectopic

(c) atopic (d) ectrophic

**Part B** (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Differentiate windows and linux operating systems.

Or

(b) List out the scope of bioinformatics.

12. (a) Compare pairwise sequence alignment and multiple sequence alignment.

Or

(b) Comment on any two sequence alignment tools and its applications.

13. (a) Discuss about protein sequence databases.

Or

(b) Write about TGCA database and its importance.

14. (a) Discuss about chemical structure representation databases.

Or

(b) Write about chemical structure file formats with examples.

15. (a) Comment on medical informatics ethics.

Or

(b) Write about medical coding systems.

**Part C** (3 × 10 = 30)

Answer any **three** questions.

16. Write an essay on the scope, importance and applications of bioinformatics.

17. Explain in detail about sequence alignment tools with suitable illustrations.

18. Discuss about

(a) nucleic acid database

(b) carbohydrate database

19. Write an essay on chemoinformatics tools with reference to structure visualization.

20. Describe in detail about telemedicine and telehealth.

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**R5991**

**Sub. Code**
**508501**

**M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021**

**First Semester**

**Biomedical Science**

**FORENSIC SCIENCE**

**(CBCS – 2019 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Punishable offences are
   (a) Abortion (b) Murder
   (c) Kidnapping (d) All the above
2. Who is the father of western medicine
   (a) Shushruta (b) Hippocrates
   (c) Kautilya (d) None of the above
3. What type of evidence to be considered for criminal offence
   (a) physical evidence (b) biological evidence
   (c) eye witness (d) all the above
4. IPC stands for ————
   (a) Intellectual property code
   (b) Indian penal code
   (c) International property code
   (d) Indian property code

5. Victim is identified from blood based on

(a) ABO blood group (b) Rh factor

(c) Both (a) and (b) (d) Haemoglobin

6. Poison is metabolized in ———————— organs.

(a) stomach (b) intestine

(c) lungs (d) liver

7. Polygraph is the test for

(a) Lie detection

(b) Biometric analysis

(c) Foot print analysis

(d) Finger print analysis

8. Easter blot is used to detect

(a) Protein (b) DNA

(c) RNA (d) Lipid

9. Psychologist studies normal and abnormal behavior of

(a) Mental states (b) Perceptual

(c) Emotional (d) All the above

10. Insomnia is the condition of

(a) Sleep disorder (b) Blood disorder

(c) Genetic disorder (d) Metabolic disorder

**Part B** $(5 \times 5 = 25)$

Answer **all** questions choosing either (a) or (b).

11. (a) Write brief notes on development of forensic science.

Or

(b) Write briefly about future scope of forensic science in India.

12. (a) Explain how to manage crime scene from natural disaster.

Or

(b) Explain the protocols to identify the illegal activities.

13. (a) Write different types of biological samples used to identify the victim of illegal activity.

Or

(b) Write the importance of chemistry in forensic science.

14. (a) Explain briefly various tests to be adopted for polygraph.

Or

(b) What is the significance of speaker identification in cyber crime?

15. (a) Discuss briefly modern perspectives of psychology.

Or

(b) Explain the importance of BEOSP in forensic science.

**Part C** $(3 \times 10 = 30)$

Answer any **three** questions.

16. Narrate in detail various forensic laboratories in India. Add a note on the importance of the same.

17. Explain crime scene management from manmade and natural disaster. Add a note on its investigation.

18. Write a detail notes on serology of forensic science.

19. Discuss DNA finger printing techniques. How to analyse paternity and maternity of a child.

20. Write about various types of psychological professionals and their research methods.

**R5992**

**Sub. Code**
**508301**

**M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021**

**Third Semester**

**Biomedical Science**

**PHARMACEUTICAL CHEMISTRY**

**(CBCS – 2019 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

All questions carry equal marks.

1. Acid is a

   (a) Proton donar (b) Proton acceptor

   (c) Both (a) and (b) (d) None of the above

2. Buffer is a mixture of

   (a) Acid and Base (b) Acid alone

   (c) Base alone (d) None of the above

3. Emetics is an agent that produces

   (a) vomitting (b) nausea

   (c) Both (a) and (b) (d) None of the above

4. Antidote is a

   (a) drug (b) chelating substance

   (c) chemical (d) all the above

5. Which of the following drug is used as an antituburcular drug

(a) Clofazimine (b) Thiam butosine

(c) Encitine (d) Rifampicin

6. Mannitol is a diuretic as it

(a) increases urine production

(b) reduces urine production

(c) non-osmotic diuretic

(d) increases swelling

7. Hypoglycemic agent metformin works by

(a) increasing the insulin level

(b) reduces glucose production in liver

(c) reduces body's sensitivity to insulin

(d) increases glucose production in liver

8. Congo red is used in the diagnosis of which of the following disease.

(a) Amyloidosis

(b) Cellular membrane permeability

(c) Micro vascular leakage

(d) Plasma volume

9. Which of the following is called as a source of impurities

(a) organic impurities derived from starting materials, by products, synthetic intermediates.

(b) Inorganic impurities derived during manufacturing process like reagents, ligands, inorganic salts, heavy metals catalysts etc.

(c) Both organic and inorganic impurities

(d) Either organic (or) inorganic

10. The term "Quality Control" refers to which of the following?

(a) Sum of all procedures undertaken to ensure the identity and purity of a particular drug

(b) To verify the product quality against predefined standards

(c) To ensure that final products are consistent safe, effective and predictable

(d) All of the above

**Part B** $(5 \times 5 = 25)$

Answer **all** questions, choosing either (a) or (b).

11. (a) What are acidifying agents? Why they are called so. Give suitable example.

Or

(b) Name few antimicrobials and give its properties, mechanism of action.

12. (a) Differentiate expectorants from emitics.

Or

(b) Give the significance of any two dental products.

13. (a) Name the disease caused by Mycobacterium Leprae. Write short note on anti-leprotic drugs.

Or

(b) Define Analeptics and comment on Theophilline, caffeine.

14. (a) Differentiate analgesics and antipyretics.

Or

(b) Write shortly on the advantages and disadvantages of steroid drugs.

15. (a) How are radioactivity measured?

Or

(b) How are cations, anions identified as per Indian Pharmacopoeia standards?

**Part C** $(3 \times 10 = 30)$

Answer any **three** questions.

All questions carry equal marks.

16. Write elaborately an antimicrobials properties, uses, storage with reference to Hydrogen perioxide and potassium permanganate.

17. Discuss in detail on the role of sodium nitrite as an antidote.

18. Write in detail on the antifungal agents - udecylenic acid and amphotericin with reference to properties and uses.

19. Enumerate on the hypoglyamic agents- Insulin, phenformin on its properties and uses.

20. What are types of radiations and write in detail on the biological effects of radiations.

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**R5993**

**Sub. Code**
**508302**

**M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021**

**Third Semester**

**Biomedical Science**

**PHARMACOLOGY AND TOXICOLOGY**

**(CBCS – 2019 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

All questions carry equal marks.

1. Enteral route of drug administration includes Which of the following

   (a) oral (b) rectal

   (c) oral and rectal (d) under the tongue

2. Pharmacodynamics means

   (a) Area of pharmacology concerned with the relationship between a drug's concentration at the site of action and the resulting effect and to measure the relationship with in an individual or group

   (b) It is the study of the interactions between drugs and the body

   (c) It is the study of the biochemical and physiological effects of drugs on body

   (d) All of the above

3. Psychopharmacological agents are used to

(a) study the effect of drugs on mood, sensation, thinking and behaviour

(b) study of correlation between drug induced changes in the functioning of cells in the central nervous system and changes in consiousness and behaviour

(c) Both (a) and (b)

(d) Study the mood

4. Which of the following drug is a neuromuscular blocker

(a) Succinyl choline (b) Vecuronium

(c) Artracurium (d) All the above

5. Which of the following are called as bronchodilators.

(a) Beta-2-agonist (b) Anticholinergics

(c) Theophilline (d) All of the above

6. The most common medicine used to lower the cholesterol are

(a) Statin drugs

(b) HMG CoA reductase inhibitors

(c) Actin drugs

(d) Both (a) and (b)

7. The Bisphenol A is a common food additive because it

(a) Act like the hormone estrogen and interfere with puberty and fertility

(b) It is a sugar substitute

(c) It linked to neurotoxic effects

(d) It used as an antidote to cyanide poisoning

8. LD 50/LC 50 means

(a) Measure of lethal dose/lethal concentration of toxin

(b) Measure of toxic doses/toxic concentration of a toxin

(c) Both (a) and (b)

(d) Therapeutic Index

9. Which of the following represents hepatic injury

(a) Hepato cellular

(b) Cholestatic

(c) Both (a) and (b)

(d) None of the above

10. Photo sensitivity is a skin inflammation developed due to

(a) Sunlight (b) Drug

(c) Bacteria (d) Both (a) and (b)

**Part B** ($5 \times 5 = 25$)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write a short account on advantages and disadvantages of adopting various routes of administration of drugs.

Or

(b) Write briefly on important factors that modify drug action.

12. (a) Discuss briefly on any one psychopharmacological agents.

Or

(b) Discuss briefly on drugs used in Myasthemia gravis.

13. (a) Write with suitable example the important difference between antitussive and expectorant.

Or

(b) Define peripheral vasodilators and its functions with example.

14. (a) Write an account on drug of abuse? With suitable example.

Or

(b) Write briefly on bacterial toxin.

15. (a) How are enzymes playing a major role in the detoxification of durgs.

Or

(b) What is organ toxicity? What are the causative factors for it.

**Part C** (3 × 10 = 30)

Answer any **three** questions.

All questions carry equal marks.

16. Explain in detail the general mechanism involved in drug action and factors affecting it.

17. Write elaborately on drugs acting on autonomic nervous system.

18. Discuss on antihypertensive agents used as drugs.

19. Comment on types of toxicity and measurement in detail.

20. Enumerate on role of liver enzymes in metabolism.

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**R5994**

| Sub. Code |
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| 508303 |

**M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021**

**Third Semester**

**Biomedical Science**

**BIOMATERIALS AND TISSUE ENGINEERING**

**(CBCS – 2019 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

1. Biomaterial includes

   (a) Metals (b) Polymers

   (c) ceramics (d) all the options given

2. Biomaterial must be in contact with

   (a) soft tissue (b) body fluids

   (c) hard tissue (d) all the above

3. Bioceramics have the crystalline structure of

   (a) Single crystalline (b) Poly crystalline

   (c) Both (a) and (b) (d) None of the above

4. Most important host reactions to biomaterials and their evaluation are

   (a) non-specific inflammation

   (b) specific immunological reactions

   (c) systemic effects

   (d) all the above

5. Polymethyl meta acrylate is used to induce

   (a) Bone regeneration

   (b) Cartilage regeneration

   (c) Tissue regeneration

   (d) None of the above

6. Vascular implants are generally made up of

   (a) Polymers (b) Composites

   (c) Both (a) and (b) (d) Ceramics

7. Inflammatory response is a type of

   (a) Immune response (b) Host response

   (c) Implant response (d) None of the above

8. Host will react against implanted material is called

   (a) Cellular response (b) Implant response

   (c) Both (a) and (b) (d) None of the above

9. The goal of tissue engineering is to assemble functional construct that

   (a) Restore damaged tissue

   (b) Maintain damaged tissue

   (c) Improve damaged tissue

   (d) All the options

10. Hemopoietic stem cells are

(a) Totipotent (b) Multipotent

(c) Monopotent (d) None of the above

**Part B** ($5 \times 5 = 25$)

Answer **all** questions choosing either (a) or (b).

11. (a) Write short note on impact of biomaterials.

Or

(b) Write short note on tissue interaction of implant biomaterials.

12. (a) Write the adverse effect of implanted materials with body tissue.

Or

(b) Discuss the importance of orthopedic implants and biomedical application.

13. (a) Describe hemocompatability of synthetic vascular implant materials.

Or

(b) What is implant failure? How can overcome the implant failure?

14. (a) Briefly describe vascular events of inflammatory response.

Or

(b) Write the importance of ECM in tissue regeneration.

15. (a) Briefly describe about bioactive scaffold in tissue engineering.

Or

(b) Write the importance of natural polymer tissue engineering.

## Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain in detail about different methods of synthesis and properties of hydroxyapatite. Add a note on their biomedical applications.

17. Describe in detail about various biomaterials used for orthopedic implant.

18. Narrate various materials used as dental filling materials with reference to oral hygiene.

19. Explain the fundamentals and interactions of protein adsorption on material surface.

20. Discuss the basic principle and functions of stem cells in tissue engineering.

| R5995 | Sub. Code |
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| | 508505 |

**M.Sc. DEGREE EXAMINATION, NOVEMBER – 2021**

**Third Semester**

**Biomedical Sciences**

**MOLECULAR ADVANCED DIAGNOSTICS**

**(CBCS – 2019 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 2 = 20)

Answer **all** questions.

All questions carry equal marks.

1. Which among the following is an example for inherited metabolic disorders?

   (a) Gaucher's disease

   (b) Phenylketonuria

   (c) Zellweger syndrome

   (d) All the above

2. Which transport media is used for the collection of stool sample suspected to contain enteric pathogens?

   (a) Stuart transport medium

   (b) Cary Blair transport medium

   (c) Amies medium

   (d) All the above

3. If the sequence of only one strand is known for primer synthesis, the best PCR variant that allow amplification of DNA with only one known sequence is

(a) Hot start PCR (b) Multiplex PCR

(c) Inverse PCR (d) Nested PCR

4. In real time PCR, TaqMan contains two dyes namely

(a) reporter, quencher (b) detector, blinder

(c) blue, green (d) none of the above

5. Labelled antibodies are used to detect

(a) the presence of particular protein molecule in Western blotting

(b) the presence of particular DNA molecule in Southern blotting

(c) the presence of particular RNA molecule in Southern blotting

(d) the presence of particular protein molecule in Southern blotting

6. Which type of DNA cleavage is done in the Maxam Gilbert method?

(a) Edge (b) Interstitial

(c) Base-specific (d) Gene-specific

7. All are applications of DNA fingerprinting except

(a) in forensic science

(b) to settle disputed parentage

(c) to amplify a minisatellite

(d) diagnosis of inherited disorders

8. DNA fingerprinting relies on identifying specific

(a) coding sequences (b) non-coding sequences

(c) both (a) and (b) (d) promotors

9. What would happen if the anti-human Ig-conjugate is not washed free of the well before the substrate is added?

(a) The ELISA would not develop when the substrate was added

(b) The EUSA would develop normally

(c) All wells would show uniform over-development due to unbound and excess anti-human Ig enzyme conjugate

(d) None of the above

10. What type of solutions should be used to disinfect a bench top before and after lab?

(a) Sodium Chloride (b) Sodium Fluoride

(c) Sodium Carbonate (d) Bleach/ethanol

**Part B** $(5 \times 5 = 25)$

Answer **all** questions, choosing either (a) or (b).

11. (a) Describe the mode of transmission of infectious diseases.

Or

(b) Discuss on method of collection of blood and CSF samples.

12. (a) Differentiate between probes and primers.

Or

(b) Describe on fluorescent *in situ* hybridization.

13. (a) Give an account on isotopic and non-isotopic methods of DNA labelling.

Or

(b) Illustrate on the bioinformatics methods of sequence assembly and annotation.

14. (a) Explain on various methods of culture independed analysis of bacteria.

Or

(b) Elaborate on amplified fragment length polymorphism.

15. (a) Describe on major histocompatibility complex.

Or

(b) Give a detailed account on immunotherapy.

**Part C** $(3 \times 10 = 30)$

Answer any **three** questions.

Each questions carry equal marks.

16. Give a detailed note on host parasite relationships.

17. Elaborate on karyotype analysis of various samples.

18. Write an essay on various blotting techniques used in disease diagnostics.

19. Explain on how 16S and 18S rRNA sequences are universal for organism identification.

20. Write in detail about immunodiagnostic methods.

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