



K24U 0091

Reg. No.:

Name :

**Sixth Semester B.Sc. Degree (C.B.C.S.S.-OBE – Regular/Supplementary/
Improvement) Examination, April 2024
(2019 to 2021 Admissions)
CORE COURSE IN ZOOLOGY
6B12ZLG : Developmental Biology**

Time : 3 Hours

Max. Marks : 40

Instruction : Give illustrations and figures **wherever** necessary.

I. **Essay** questions. **Each** question carries **8** marks. Answer **any two**.

- 1) Explain the development of eye in frog with required illustrations.
- 2) Describe the techniques used in infertility management.
- 3) Using suitable diagrams, classify the different types of eggs seen in the animal kingdom. Add a note on the influence of yolk in the types of cleavage in eggs.
- 4) Write a description on the structure, development and role of extraembryonic membranes in chick, using a diagram. Add a note on placenta and its role in mammals. (2×8=16)

II. **Short Essay** questions. **Each** question carries **4** marks. Answer **any two**.

- 5) Explain neurulation in *Amphioxus*, with necessary diagrams.
- 6) Describe Spemann's constriction experiments on amphibian embryos. Add a note on the significance.
- 7) Comment on the properties and applications of stem cells. (2×4=8)

P.T.O.



III. **Short Answer** questions. **Each** question carries **2** marks. Answer **any six**.

- 8) What is primitive streak ? Comment on its significance.
- 9) Write notes on the theories of preformation and epigenesis in developmental biology.
- 10) Differentiate arrhenotoky and thelytoky with examples.
- 11) What is capacitation ?
- 12) What are teratogens ? Give two examples of teratogenicity.
- 13) Write a note on the hormonal control of metamorphosis in insects.
- 14) Differentiate between coeloblastula and stereoblastula with examples.
- 15) What are the stages of parturition in humans ? (6×2=12)

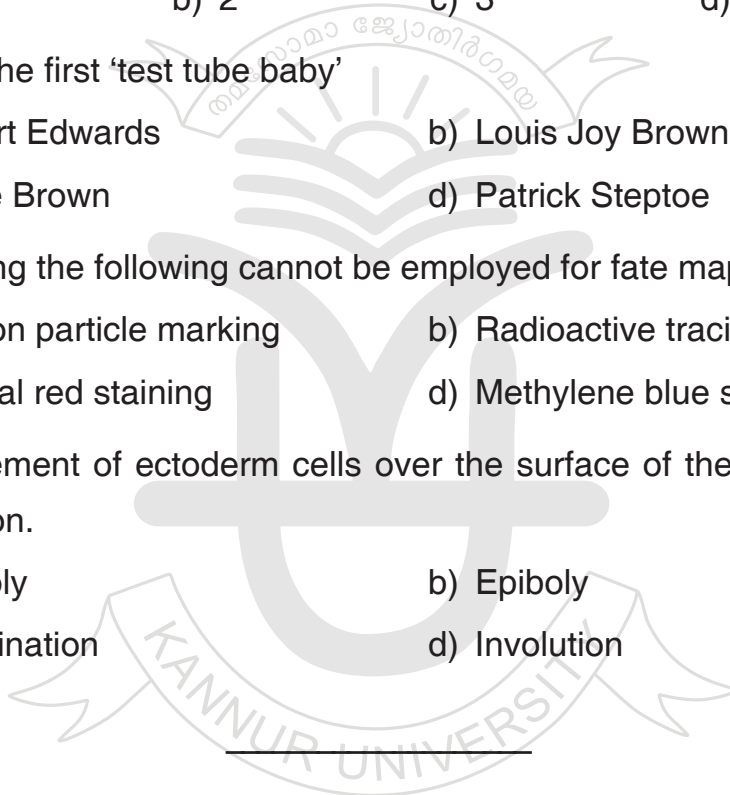
IV. **Multiple Choice** questions. **Each** question carries **0.5** marks. Answer **all**.

- 16) _____ is not a primary egg membrane.
 - a) vitelline membrane of birds
 - b) zona radiata of bony fishes
 - c) zona pellucida of mammals
 - d) corona radiata of mammals
- 17) Metamorphosis in amphibians is triggered by environmental cues like temperature and light, that stimulates the neurosecretory cells of the
 - a) hypophysis
 - b) thyroid
 - c) hypothalamus
 - d) adrenals
- 18) Insect eggs show
 - a) Holoblastic equal cleavage
 - b) Meroblastic superficial cleavage
 - c) Holoblastic unequal cleavage
 - d) Meroblastic discoidal cleavage



- 19) Formation of fertilization membrane around the egg
- a) Blocks polyspermy
 - b) allows easy implantation of the embryo
 - c) Prevents fertilization events
 - d) causes sperm agglutination on egg surface
- 20) The number of functional ovaries in adult hen is
- a) 1
 - b) 2
 - c) 3
 - d) 4
- 21) Name of the first 'test tube baby'
- a) Robert Edwards
 - b) Louis Joy Brown
 - c) Leslie Brown
 - d) Patrick Steptoe
- 22) One among the following cannot be employed for fate map construction
- a) Carbon particle marking
 - b) Radioactive tracing
 - c) Neutral red staining
 - d) Methylene blue staining
- 23) The movement of ectoderm cells over the surface of the embryo during gastrulation.
- a) Emboly
 - b) Epiboly
 - c) Invagination
 - d) Involution

(8×0.5=4)





K24U 0088

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**Sixth Semester B.Sc. Degree (C.B.C.S.S.-OBE – Regular/Supplementary/
Improvement) Examination, April 2024**

(2019 to 2021 Admissions)

CORE COURSE IN ZOOLOGY

6B09 ZLG : Cell Biology, Immunology and Microbiology

Time : 3 Hours

Max. Marks : 40

Instruction : Give illustrations and figures *wherever* necessary.

I. **Essay** questions. **Each** question carries **8** marks. Answer **any two**. **(2×8=16)**

- 1) Describe fluid mosaic model of plasma membrane. Add notes on the functions of plasma membrane.
- 2) Briefly describe the structure of a typical antibody. Comment on different types of antigen-antibody reactions.
- 3) Give an account of various types of sterilization techniques employed in a Microbiology Laboratory.
- 4) Describe the structure of an interphase nucleus.

II. **Short essay**. **Each** question carries **4** marks. Answer **any two**. **(2×4=8)**

- 5) What is the cell cycle ? Write notes on various stages involved in cell cycle.
- 6) With the help of a neatly labeled diagram, explain the structure of a typical bacterial cell.
- 7) Give an account of different types of immunity.

III. **Short answer** questions. **Each** question carries **2** marks. Answer **any six**.

(2×6=12)

- 8) What is metastasis ?
- 9) What is autoimmunity ? Give two examples.

P.T.O.



- 10) What are fixatives ? Name any two commonly used fixatives.
- 11) Compare and contrast mitosis and meiosis.
- 12) What are nucleosomes ?
- 13) What are vital stains ? Give an example.
- 14) Distinguish between viroids and prions.
- 15) Write any two bacterial diseases and name its causative.

IV. **Multiple choice** questions. **Each** question carries **0.5** marks. Answer **all**.

(8×0.5=4)

- 16) Oxidative phosphorylation takes place in
 - a) Ribosome
 - b) Endoplasmic reticulum
 - c) Cytoplasm
 - d) Mitochondria
- 17) Lysosomes are formed from _____
 - a) Mitochondria
 - b) Ribosome
 - c) Golgibody
 - d) Endoplasmic reticulum
- 18) Major immunoglobulin found in human colostrum and milk.
 - a) IgA
 - b) IgG
 - c) IgM
 - d) IgE
- 19) The duplication of chromosomes without the division of nucleus is called as
 - a) Amitosis
 - b) Endomitosis
 - c) Plasmotomy
 - d) Karyogamy
- 20) A small molecule that, when combined with a larger carrier molecule, can elicit an immune response, leading to the formation of antibodies.
 - a) Adjuvant
 - b) Hapten
 - c) Epitope
 - d) CDRs



21) Which type of hypersensitivity reaction is characterized by an immediate and IgE mediated immune response ?

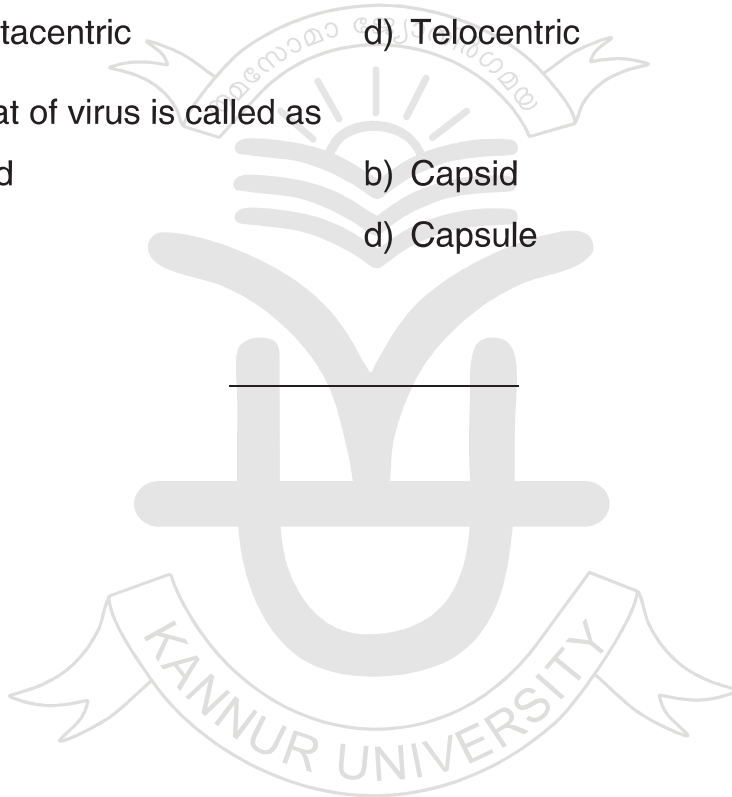
- a) Type I
- b) Type II
- c) Type III
- d) Type IV

22) The chromosome with its centromere slightly shifted towards one end and located close to the centre.

- a) Metacentric
- b) Acrocentric
- c) Submetacentric
- d) Telocentric

23) Protein coat of virus is called as

- a) Plasmid
- b) Capsid
- c) Viroid
- d) Capsule





K24U 0090

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**Sixth Semester B.Sc. Degree (C.B.C.S.S.-OBE – Regular/Supplementary/
Improvement) Examination, April 2024
(2019 to 2021 Admissions)
CORE COURSE IN ZOOLOGY
6B11ZLG : Environmental Science**

Time : 3 Hours

Max. Marks : 40

I. **Essay** questions. **Each** question carries **8** marks. Answer **any two**. (2×8=16)

- 1) Comment on the physical features, fauna, and their adaptations in different terrestrial ecosystems.
- 2) Describe the major abiotic factors that exist in an ecosystem. Add a note on the interrelationship between biotic and abiotic factors.
- 3) Explain the causes, effects, and remedial measures of major types of pollution.
- 4) Describe the faunal characteristics of zoogeographical realms.

II. **Short essay** questions. **Each** question carries **4** marks. Answer **any two**.

(2×4=8)

- 5) Briefly explain the major concepts of energy flow in the ecosystem.
- 6) Narrate the economic values of the species diversity.
- 7) Describe the role of NBA and SBB in biodiversity conservation.

III. **Short answer** questions. **Each** question carries **2** marks. Answer **any six**.

(6×2=12)

- 8) Define perfect nutrient cycles. Give one example.
- 9) Explain the process of succession.

P.T.O.



- 10) With examples explain proto cooperation.
- 11) Explain population fluctuations.
- 12) Write a note on disaster-prone regions in India.
- 13) Differentiate between in-situ and ex-situ conservation.
- 14) Explain the Liebig's law of minimum.
- 15) What are the major causes leading to loss of biodiversity ?

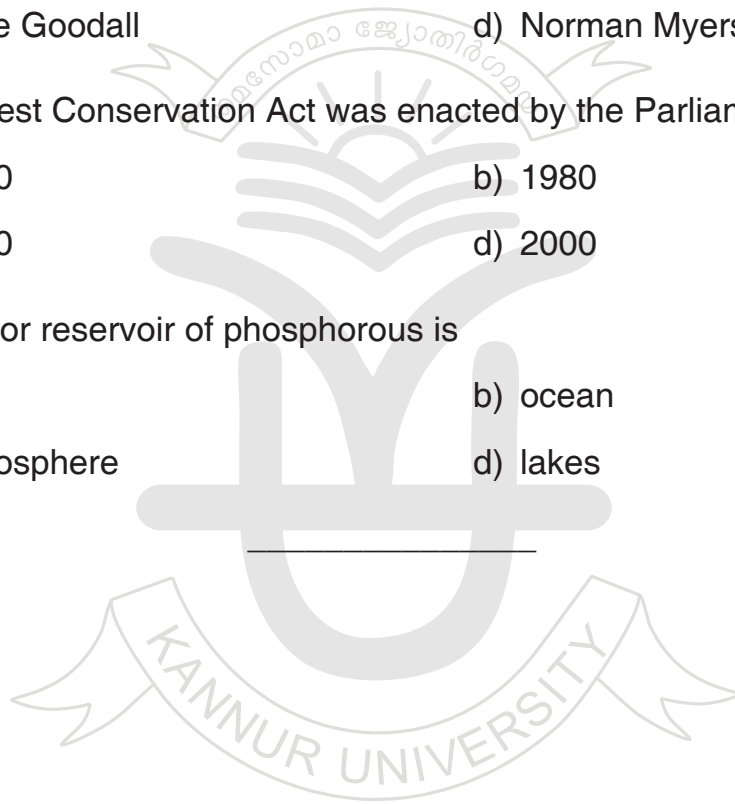
IV. **Multiple choice** questions. **Each** question carries **0.5** marks. Answer **all**.

(8×0.5=4)

- 16) The quantitative measure of the relative extant or degree of maternal recycling in the biosphere is
 - a) Recycling index
 - b) Recycling pathway
 - c) Recycling plan
 - d) Recycling profit
- 17) Project Elephant was launched by Govt. of India in the year
 - a) 1973
 - b) 1992
 - c) 1956
 - d) 1984
- 18) Parasites that accidentally reach an unusual host and survive there are called
 - a) Erratic parasites
 - b) Sporadic parasite
 - c) Obligatory parasite
 - d) Incidental parasite
- 19) The usefulness of biodiversity in providing goods and materials for the direct use of man and domestic animals is called
 - a) consumptive use value
 - b) productive use value
 - c) social use value
 - d) aesthetic use value



- 20) In general _____ phase of growth patterns are called as establishment phase.
- a) Lag
 - b) Log
 - c) Expansion
 - d) Exponential
- 21) The term 'Biodiversity hotspot' was coined by
- a) Thomas Lovejoy
 - b) Edward O. Wilson
 - c) Jane Goodall
 - d) Norman Myers
- 22) The Forest Conservation Act was enacted by the Parliament of India on
- a) 1970
 - b) 1980
 - c) 1990
 - d) 2000
- 23) The major reservoir of phosphorous is
- a) soil
 - b) ocean
 - c) atmosphere
 - d) lakes





K24U 0089

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**Sixth Semester B.Sc. Degree (C.B.C.S.S.-OBE – Regular/Supplementary/
Improvement) Examination, April 2024**

(2019 to 2021 Admissions)

CORE COURSE IN ZOOLOGY

6B10ZLG : Molecular Biology and Bioinformatics

Time : 3 Hours

Max. Marks : 40

- I. **Essay** questions. **Each** question carries **8** marks. Answer **any two**.
- 1) Elaborate Watson and Crick model of DNA structure.
 - 2) Differentiate between lytic and lysogenic cycle of bacteriophage.
 - 3) Elaborate on genetic code and its features. Mention wobble hypothesis.
 - 4) What are the applications of bioinformatics ? **(2×8=16)**
- II. **Short essay** questions. **Each** question carries **4** marks. Answer **any two**.
- 5) What are split genes ?
 - 6) Comment on various enzymes involved in DNA replication.
 - 7) Briefly explain major metabolite data bases. **(2×4=8)**
- III. **Short answer** questions. **Each** question carries **2** marks. Answer **any six**.
- 8) Differentiate between condensins and cohesins.
 - 9) What is RNA interference ?
 - 10) Which are the different types of RNAs ?
 - 11) Define rDNA technology.
 - 12) What are Okazaki fragments ?
 - 13) Which are the various sites found on a functional ribosome ?
 - 14) Explain BLAST.
 - 15) Differentiate primary and secondary data bases. **(6×2=12)**

P.T.O.



IV. **Multiple choice questions.** Each question carries **0.5** marks. Answer **all**.

- 16) The fragments of DNA are joined by
- a) Ligase
 - b) Polymerase
 - c) Gyrase
 - d) Endonuclease
- 17) What is a cistron in molecular genetics ?
- a) A segment of RNA that codes for a specific protein
 - b) A region on a chromosome that regulates gene expression
 - c) A unit of genetic information that codes for a single polypeptide
 - d) A type of RNA involved in splicing
- 18) Which histone protein is not part of the core histones in a nucleosome ?
- a) H2A
 - b) H2B
 - c) H5
 - d) H4
- 19) How many base pairs are present in a turn of Z DNA ?
- a) 15
 - b) 12
 - c) 10
 - d) 8
- 20) Who proposed the semiconservative model of DNA replication ?
- a) James Watson and Francis Crick
 - b) Rosalind Franklin
 - c) Maurice Wilkins
 - d) Matthew Meselson and Franklin Stahl
- 21) Which nucleotide is typically added to the 5' end during capping of hnRNA ?
- a) Adenine (A)
 - b) Cytosine (C)
 - c) Guanine (G)
 - d) Uracil (U)
- 22) The lac operon is involved in the metabolism of
- a) Lactose
 - b) Glucose
 - c) Amino acids
 - d) Fatty acids
- 23) BLAST is commonly used for
- a) DNA sequencing
 - b) Protein structure prediction
 - c) Sequence alignment and similarity searching
 - d) PCR amplification

(8×.5=4)



K23U 0546

Reg. No. :

Name :

**VI Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/
Improvement) Examination, April 2023
(2019 and 2020 Admissions)
CORE COURSE IN ZOOLOGY
6B12 ZLG : Developmental Biology**

Time : 3 Hours

Max. Marks : 40

I. Essay questions (**Each** question carries **8** marks) Answer **any two**.

- 1) Discuss the different types of parthenogenesis. Mention the significance of parthenogenesis.
- 2) Elaborate the fate map of frog, with the help of a diagram. Explain any three methods of construction of fate map.
- 3) Describe the events and different types of regeneration. Add a note on the factors influencing regenerative process.
- 4) Describe the development of eye in frog. **(8×2=16)**

II. Short essay questions (**Each** question carries **4** marks) Answer **any two**.

- 5) Explain any four assisted reproductive techniques.
- 6) Describe the different types of blastula.
- 7) Elaborate the salient features of 48 hour chick embryo. **(4×2=8)**

III. Short answer questions (**Each** question carries **2** marks) Answer **any six**.

- 8) What is parturition ?
- 9) What is teratology ? Give examples for drugs which act as teratogens.
- 10) Classify egg membranes.
- 11) What are the functions of yolk sac ?

P.T.O.



- 12) Differentiate totipotency and pluripotency.
- 13) Draw a neatly labelled diagram of structure of human sperm.
- 14) What are the morphological changes during amphibian metamorphosis ?
- 15) What is epiboly ? **(2×6=12)**

IV. Multiple choice questions (**Each** question carries **0.5** marks) Answer **all**.

- 16) The period of development of foetus within the mother is
a) Parturition b) Implantation c) Capacitation d) Gestation
- 17) Hormone which induces lactation
a) Thyroxine b) Prostaglandins
c) hCG d) Prolactin
- 18) Which of the following organs is a derivative of ectoderm ?
a) Brain b) Bone c) Kidney d) Heart
- 19) Any agent that causes an abnormality following foetal exposure during pregnancy is
a) Teratogen b) Organizer c) Morphogen d) Inductor
- 20) Eggs of insects are
a) Telolecithal b) Macrolecithal
c) Slightly telolecithal d) Centrolecithal
- 21) Formation of central nervous system is
a) Gastrulation b) Notogenesis c) Neurulation d) Organogeny
- 22) Which of the following is a primary organiser in amphibian development ?
a) Chorda mesoderm b) Lens
c) Optic vesicle d) Optic cup
- 23) Which of the following genes play significant role in patterning antero-posterior axis in animals ?
a) Homeotic genes b) Hox genes
c) Segment polarity genes d) Gap genes **(8×0.5=4)**
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K23U 0545

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**VI Semester B.Sc. Degree (CBCSS-OBE-Regular/Supplementary/
Improvement) Examination, April 2023
(2019 and 2020 Admissions)
CORE COURSE IN ZOOLOGY
6 B11 ZLG : Environmental Science**

Time : 3 Hours

Max. Marks : 40

I. Essay Questions (**Each** question carries **8** marks). Answer **any two**.

- 1) Describe the process of ecological succession. What are the types of succession ?
- 2) Elaborate carbon cycle using a diagram.
- 3) Describe the characteristic features of different kinds of animal distribution over biosphere, citing two examples each.
- 4) Explain the causes and impacts of water pollution in Kerala context. Suggest remedial measures. (8×2=16)

II. Short essay questions (**Each** question carries **4** marks). Answer **any two**.

- 5) Briefly describe the impacts of global warming.
- 6) What are the adaptive features of cave dwelling animals ?
- 7) Describe the role of biotic factors in an ecosystem. (4×2=8)

III. Short answer questions (**Each** question carries **2** marks). Answer **any six**.

- 8) List out any four causes of loss of biodiversity.
- 9) Define predation. Mention its importance in maintaining ecological balance.
- 10) Mention four mitigation measures related to flood.
- 11) What is the significance of food web in an ecosystem ?
- 12) State Liebig's Law of Minimum.
- 13) What are features of continental islands ?

P.T.O.



14) Differentiate emigration and immigration with reference to population dispersal.

15) Mention the characteristics of pyramid of energy. (2×6=12)

IV. Multiple choice question (**Each** question carries **0.5** marks). Answer **all**.

16) Which of the following is a strategy for ex-situ conservation ?

- a) Wildlife sanctuaries b) Gene banks
c) National Parks d) Biosphere reserve

17) Organisms which absorb soluble organic nutrients from dead organic matter are

- a) Saprotrophs b) Autotrophs c) Chemotrophs d) Parasites

18) The relationship between Adamsia and hermit crab is an example of

- a) Mutualism b) Parasitism
c) Commensalism d) Competition

19) How many biodiversity hot spots are there in India ?

- a) 2 b) 3 c) 4 d) 1

20) Which of the following do not contribute to greenhouse effect ?

- a) Water vapour b) Nitrogen c) Nitrous oxide d) Ozone

21) Which of the following is direct value of biodiversity ?

- a) Aesthetic value b) Social value
c) Cultural value d) Consumptive value

22) Age pyramid of a declining population will be

- a) Bell shaped b) Urn shaped c) Upright d) Triangular

23) India belongs to which of the following Zoogeographical realm ?

- a) Oriental b) Ethiopian c) Palearctic d) Neotropical

(0.5×8=4)



K23U 0544

Reg. No. :

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**VI Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/
Improvement) Examination, April 2023
(2019 and 2020 Admissions)**

Core Course in Zoology

6B10 ZLG : MOLECULAR BIOLOGY AND BIOINFORMATICS

Time : 3 Hours

Max. Marks : 40

I. Essay questions (**Each** question carries **8** marks). Answer **any two**.

- 1) Explain any four DNA repair mechanisms.
- 2) Describe two experiments to prove DNA as genetic material.
- 3) Briefly explain the different types of databases used in bioinformatics.
- 4) Give an account of various enzymes involved in DNA replication. **(2×8=16)**

II. Short essay questions (**Each** question carries **4** marks). Answer **any two**.

- 5) What are microarrays ? Write its applications.
- 6) Explain the post-transcriptional modifications the hn-RNA undergoes in a eukaryotic cell.
- 7) What is the genetic code ? Briefly explain its characteristics. **(2×4=8)**

III. Short answer questions (**Each** question carries **2** marks). Answer **any six**.

- 8) Explain CADD.
- 9) What are pseudogenes ?
- 10) Explain FASTA.
- 11) What is SiRNA ? How does it control gene expression ?
- 12) Explain central dogma in molecular biology.
- 13) Describe nucleosomes.
- 14) Explain Southern blotting.
- 15) What is metabolomics ? Mention its two applications. **(6×2=12)**

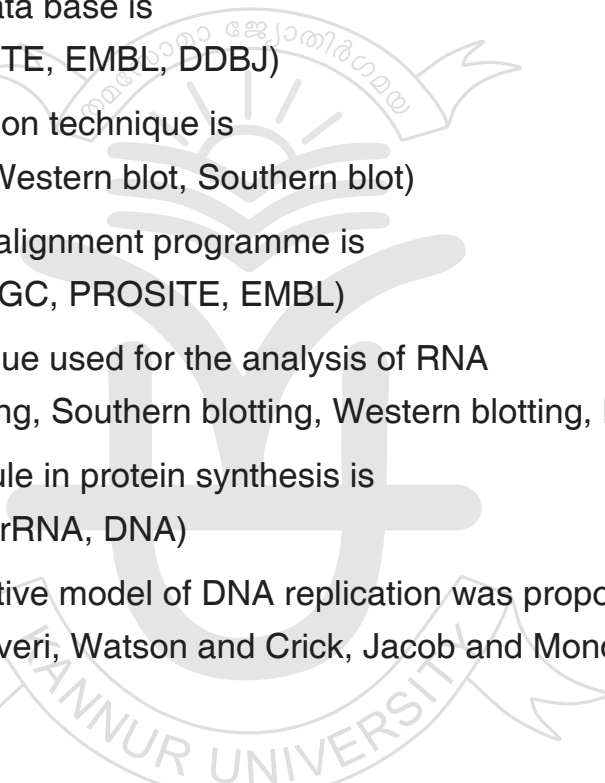
P.T.O.



IV. Multiple choice questions (**Each** question carries **0.5** marks). Answer **all**.

- 16) "Molecular Scissors" are
(DNA polymerases, Restriction endonucleases, RNA polymerases, DNA ligases)
- 17) Histones are rich in
(Tryptophan and Valine, Arginine and Lysine, Glutamic acid and Aspartic acid, Cysteine and Methionine)
- 18) A secondary data base is
(KEGC, PROSITE, EMBL, DDBJ)
- 19) DNA amplification technique is
(PAGE, PCR, Western blot, Southern blot)
- 20) The sequence alignment programme is
(CLUSTAL, KEGC, PROSITE, EMBL)
- 21) Blotting technique used for the analysis of RNA
(Northern blotting, Southern blotting, Western blotting, PCR)
- 22) Adapter molecule in protein synthesis is
(tRNA, mRNA, rRNA, DNA)
- 23) Semi-conservative model of DNA replication was proposed by
(Sutton and Boveri, Watson and Crick, Jacob and Monod, Hershey and Chase)

(8x.5=4)





K23U 0543

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Improvement) Examination, April 2023
(2019 and 2020 Admissions)
CORE COURSE IN ZOOLOGY
6B09ZLG : Cell Biology, Immunology and Microbiology**

Time : 3 Hours

Max. Marks : 40

I. **Essay** questions (**Each** question carries **8** marks) Answer **any two**.

- 1) Describe the structure of bacteria. Draw a neatly labelled diagram.
- 2) Explain the functions of plasma membrane.
- 3) Describe the structure of lysosome and functional significance of polymorphic forms of lysosomes. What is GERL concept ?
- 4) Describe the different types of hypersensitivity. Add a note on autoimmune reactions. (8×2=16)

II. Short **essay** questions (**Each** question carries **4** marks) Answer **any two**.

- 5) Describe the industrial and agricultural applications of Microbiology.
- 6) What are the features of cancer cells ? Add a note on HeLa cells.
- 7) Give a brief description about structure of lamp brush chromosomes, using a diagram. (4×2=8)

III. Short answer questions (**Each** question carries **2** marks) Answer **any six**.

- 8) Differentiate heterochromatin and euchromatin.
- 9) Draw a neat and labelled diagram of typical structure of antibody.
- 10) Mention any four functions of endoplasmic reticulum.
- 11) How do colchicine affect cell division ?
- 12) Name the pathogen which causes the following diseases. Suggest preventive measures for each disease.
 - 1) Tuberculosis
 - 2) Poliomyelitis.

P.T.O.



- 13) Bring out the significance of fixation and cite an example for fixative.
- 14) What is opsonisation ?
- 15) Mention any two chemical sterilization techniques in microbiology. (2×6=12)

IV. Multiple choice questions. (Each question carries 0.5 marks) Answer all.

- 16) Philadelphia chromosome is associated with which of the following diseases ?
 - a) Retinoblastoma
 - b) Chronic myeloid leukemia
 - c) Rheumatic fever
 - d) SARS
- 17) Which of the following is a vital stain ?
 - a) Janus green
 - b) Eosin
 - c) Haematoxylin
 - d) Carmine
- 18) Bergey’s manual describes the system of classification of
 - a) Viruses
 - b) Bacteria
 - c) Algae
 - d) Fungi
- 19) Immunoglobulin present in colostrum is
 - a) Ig A
 - b) Ig M
 - c) Ig D
 - d) Ig E
- 20) The cell organelles involved in H₂O₂ metabolism
 - a) Lysosomes
 - b) Microbodies
 - c) Peroxisomes
 - d) Glyoxysomes
- 21) Small molecules such as peptides or hormones, which are not immunogenic on their own but can become immunogenic when attached to protein carriers are called
 - a) Epitopes
 - b) Haptens
 - c) Idiotope
 - d) MHCs
- 22) Chromosomes having centromere at or close to the terminal end is
 - a) Acrocentric
 - b) Metacentric
 - c) Telocentric
 - d) Submetacentric
- 23) The ion which is involved in holding the two ribosomal subunits together is
 - a) Mg⁺⁺
 - b) Fe⁺⁺⁺
 - c) Na⁺
 - d) Fe⁺⁺

(0.5×8=4)

