Roll No. _____ (To be filled in by the candidate)

(Academic Sessions 2019 – 2021 to 2021 – 2023)

BIOLOGY 223-1st Annual-(INTER PART – II) *Time Allowed : 20 Minutes*

Q.PAPER – II (Objective Type) GROUP – I Maximum Marks : 17

PAPER CODE = 8461 LHR-12-1-23

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	In urea cycle, arginine splits into urea and ornithine by an enzyme :			
	(A) Arginase	(B) Ornithase	(C) Citrulase	(D) Dehydrogenase
2	Which vertebra in reptiles is modified for the rotational movement :			
	(A) Atlas	(B) Thoracic	(C) Axis	(D) Sacral
3	At the place of attachment of leaf with the shoot, a swollen part is called :			
	(A) Pith	(B) Pit	(C) Pulvinus	(D) Cortex
4	Resting membrane potential of a neuron is :			
	(A) – 50 mV	(B) – 70 mV	(C) – 60 mV	(D) – 80 mV
5	Abscisic acid can be sprayed on tree crops to regulate :			
	(A) Leaf drop	(B) Shoot drop	(C) Flower drop	(D) Fruit drop
6	Vehicles for transport of male gamete in land plant is :			
	(A) Pollen tube	(B) Pollen grain	(C) Vacuole	(D) Anther
7	Cell wall becomes thicker and pitted during cell :			
	(A) Maturation	(B) Elongation	(C) Differentiation	(D) Division
8	Copying of mRNA from DNA is called :			
	(A) Transduction	(B) Transdation	(C) Transformation	(D) Transcription
9	DNA polymerase III :			
	(A) Recognizes primer	(B) Constructs primer		
	(C) Initiates DNA replication	(D) Unwinds DNA helix		
10	Down syndrome is :			
	(A) Trisomy 19	(B) Trisomy 18	(C) Trisomy 21	(D) Trisomy 23
11	Bombay phenotype is an example of :			
	(A) Pleiotropy	(B) Epistasis	(C) Probability	(D) Dominance
12	Primer for PCR contains about :			
	(A) 05 – 07 bases	(B) 10 – 20 bases	(C) 25 – 30 bases	(D) 30 – 40 bases
13	One common type of vector is :			
	(A) Plasmid	(B) Chromosome	(C) Lysosome	(D) Mitochondria
14	The ultimate source of all changes is :			
	(A) Genetic drift	(B) Migration	(C) Mutation	(D) Selection
15	Overgrazing may lead to :			
	(A) Tundra	(B) Grassland	(C) Desert	(D) Taiga
16	Scum in eutrophication is formed by :			
	(A) Algae	(B) Fungi	(C) Bacteria	(D) Virus
17	Which of these diseases is caused due to nutritional deficiency :			
	(A) Diphtheria	(B) Arteriosclerosis	(C) Scurvy	(D) Osteoarthritis

Roll No _____ (To be filled in by the candidate)

(Academic Sessions 2019 – 2021 to 2021 – 2023)

BIOLOGY 223-1st Annual-(INTER PART – II) Time Allowed : 2.40 hours

PAPER – II (Essay Type) GROUP – I Maximum Marks : 68

SECTION – I LHR-12-1-23

2. Write short answers to any EIGHT (8) questions : 16

(i) What is counter current multiplier mechanism?
(ii) Define excretophores. Give their functions.
(iii) Give the role of pyrogens.
(iv) What is negative geotropism? Give at least one example.
(v) Write the composition of procuticle.
(vi) Give the structure of sarcoplasmic reticulum.
(vii) What is ovoviviparity? Give an example.
(viii) Draw and label the diagram of C.S. of seminiferous tubule.
(ix) What is difference between climate and weather?
(x) What is grassland ecosystem? Give at least one example.
(xi) Define soil.
(xii) Draw the flow chart showing the formation of ASH and CO_2 from dead plants.

3. Write short answers to any EIGHT (8) questions : 16

(i) Define nerve impulse.
(ii) Define nociceptors.
(iii) What do you know about cretinism?
(iv) How can you protect the baby against Rh^- incompatibility?
(v) What is MODY?
(vi) In birds, the female is heterogametic. How?
(vii) Write down two practical uses of DNA finger printing.
(viii) Discuss any two benefits of transgenic bacteria to promote health in plants.
(ix) Define and give examples of ex-vivo and in-vivo gene therapy.
(x) What are biogeochemical cycles?
(xi) Discuss role of decomposers in ecosystem.
(xii) Define food chain. Write an example.

4. Write short answers to any SIX (6) questions : 12

(i) How light plays important role in plant growth?
(ii) Into how many layers mesoderm splits and also define the coelom?
(iii) In what way mutation causes sickle cell disease?
(iv) Why replication always take place in 5′ → 3′ direction?
(v) What do you know about Okazaki fragments?
(vi) Compare mitosis with meiosis.
(vii) Write symptoms of Down's syndrome.
(viii) Differentiate between homologous and analogous organs.
(ix) What are vestigial organs? Give one example.

SECTION – II

Note : Attempt any THREE questions.

5. (a) What is Renal failure? Describe its cure. 4
   (b) What is cancer? Give its causes and effects. 4
6. (a) Define joints. How are they classified? Explain. 4
   (b) Define succession. Explain xerosere in detail. 4
7. (a) What is active membrane potential? Explain its major causing factors. Also draw a graph that shows changes in membrane potential from resting to active membrane potential. 4
   (b) Define Hardy-Weinberg theorem. Also explain the Hardy-Weinberg equations for calculating the frequencies of alleles and genotypes in populations at equilibrium. 4
8. (a) Explain the birth of twins in human beings. 4
   (b) Describe the assortment of alleles of two contrasting pairs of traits when followed in the same cross by giving one example. 4
9. (a) What is growth? Discuss different conditions for growth. 4
   (b) Define gene therapy, explain in which diseases ex-vivo gene therapy are needed. 4

No. _____ (To be filled in by the candidate)

(Academic Sessions 2019 – 2021 to 2021 – 2023)

IOLOGY 223-1st Annual-(INTER PART – II) Time Allowed : 20 Minutes

).PAPER – II (Objective Type) GROUP – II Maximum Marks : 17

PAPER CODE = 8464 LHR-12-7-23

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	Hair end organs : (A) Receive deep pressure stimulus (B) Receive touch stimulus (C) Are located in the limbs (D) Are sensitive for vibration sense
2	During the replication process of DNA, the lagging strand : (A) Replicates towards replication fork (B) Is synthesized by DNA ligase (C) Replicates away from replication fork (D) Replicates continuously
3	Lamarckism means : (A) To calculate the gene frequency (B) Inheritance of acquired traits (C) Descent with modification (D) Natural selection and adaptation
4	Which one is a degenerative disease : (A) Scurvy (B) Kwashiorkor (C) Beriberi (D) Arteriosclerosis
5	The central cavity of the kidney where urine is collected is called : (A) Bowman's capsule (B) Vasa recta (C) Pelvis (D) Renal medulla
6	EcoR1 is : (A) Used in PCR (B) Used in reverse transcription (C) A viral enzyme (D) A restriction enzyme
7	Most of the increase in the thickness of stem is caused by : (A) Secondary xylem (B) Secondary phloem (C) Cork (D) Bark
8	Which of these dominance relations is characterized by the intermediate phenotype of heterozygote between the phenotypes of two homozygotes : (A) Complete dominance (B) Over dominance (C) Partial dominance (D) Co-dominance
9	A grassland present in temperate climate is called : (A) Prairies (B) Taiga (C) Savanna (D) Alpine grassland
10	Intercalary meristems in plants get separated from apical meristems by : (A) Permanent tissue (B) Cork tissue (C) Vascular cambium (D) Cork cambium
11	Which of these exist in xylem as solid bundles : (A) Collenchyma (B) Fibers (C) Sclereides (D) Vessels
12	According to Erwin Chargaff : (A) $A + T = C + G$ (B) $A + G = C + T$ (C) $A + C = G + T$ (D) $C + T = A + T$
13	Alternating diploid sporophyte with haploid gametophyte generation in plants is called : (A) Diplontic life cycle (B) Haplontic life cycle (C) Diplohaplontic life cycle (D) Haplodiplontic life cycle
14	G-2 of interphase : (A) Lasts for 90 minutes (B) Is post mitotic phase (C) Is pre mitotic phase (D) Is characterized by DNA synthesis
15	Which of these plant hormones inhibits the growth of root and stem during physiological stress : (A) Auxin (B) Cytokinin (C) Gibberellins (D) Abscisic acid
16	A probe is used : (A) As restriction enzyme (B) In gene therapy (C) To search genomic library (D) For the treatment of cystic fibrosis
17	Succession starting in pond is called : (A) Halosere (B) Hydrosere (C) Xerosere (D) Derosere

Roll No _____ (To be filled in by the candidate)

(Academic Sessions 2019 – 2021 to 2021 – 2023)

BIOLOGY 223-1st Annual-(INTER PART – II) Time Allowed : 2.40 hours

PAPER – II (Essay Type) GROUP – II Maximum Marks : 68

SECTION – I CHR-12-2-23

2. Write short answers to any EIGHT (8) questions : 16

(i) What are heat shock proteins? Give their role.
(ii) How are animals able to do osmoregulation in hypotonic environment?
(iii) Define homeostasis. Give components of homeostatic control system.
(iv) Write name of regions of vertebral column with number of vertebrae.
(v) Define remolding.
(vi) How does digitigrade differ from unguligrade?
(vii) Write cause and symptoms of syphilis.
(viii) What do you mean by fruit set and fruit ripening?
(ix) Name two common animals and two plants of temperate deciduous forests.
(x) Differentiate between coniferous alpine and boreal forests.
(xi) Define non-renewable resources. Give one example.
(xii) How environment is a source essential to maintain life?

3. Write short answers to any EIGHT (8) questions : 16

(i) Define coordination. Give its types in animals.
(ii) Give only two commercial uses of Gibberellins.
(iii) Write the distribution of pain and cold receptors on animal body.
(iv) Give the relationship between the terms gene and locus.
(v) What do you understand by over-dominance?
(vi) Write the pattern of inheritance of sex influenced traits.
(vii) What are restriction endonucleases? Give their functions.
(viii) Give the biotechnological uses of bacteria in mining.
(ix) What is gene therapy? Write at least one example.
(x) Write difference between habitat and niche.
(xi) Define climax community with one example.
(xii) Give the significance of predation.

4. Write short answers to any SIX (6) questions : 12

(i) What is grey crescent? Give its role.
(ii) How can aging be slowed down?
(iii) How do histone and DNA interact with each other in chromosome?
(iv) What is transforming principle?
(v) How is initiation complex formed in translation?
(vi) In what respect mitosis in plants differ from that of animal cell?
(vii) Differentiate between benign and malignant tumor.
(viii) State endosymbiont hypothesis with example.
(ix) What is meant by " Modern Synthesis"?

SECTION – II

Note : Attempt any THREE questions.

5. (a) Discuss osmoregulation in plants for their survival. 4
   (b) Define cell cycle and also give a detailed account of phases of interphase. 4

6. (a) Highlight the main points of that model which explains the muscle contraction. 4
   (b) Discuss important steps of nitrogen cycle. 4

7. (a) Describe the location, secretion and roles of thyroid gland. 4
   (b) State and explain Hardy-Weinberg theorem. 4

8. (a) Give details of menstrual cycle in human females. 4
   (b) Define law of independent assortment. Explain it with an example. 4

9. (a) What are growth correlations? Explain Apical Dominance, its removal and its applications. 4
   (b) Explain the methodology to carried out DNA finger-printing. 4

Roll No. _____ (To be filled in by the candidate)

(Academic Sessions 2018 – 2020 to 2020 – 2022)

BIOLOGY 222-(INTER PART – II) Time Allowed : 20 Minutes

Q.PAPER – II (Objective Type) GROUP – I Maximum Marks : 17

PAPER CODE = 8463 LHR-G1-22

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	Parthenocarpy is artificially induced by : (A) Cytokinins (B) Auxin (C) Ethene (D) Abscisic acid
2	Pairing of homologous chromosomes is called : (A) Bivalent (B) Tetrad (C) Synapsis (D) Crossing over
3	According to --- hypothesis, aerobic bacteria developed into mitochondria : (A) Symbiotic (B) Endosymbiont (C) Mutualistic (D) Both A and B
4	What is our principle source of energy : (A) Nuclear energy (B) Geothermal energy (C) Solar energy (D) Tidal energy
5	Bats use ---- for evaporative cooling : (A) Saliva (B) Urine (C) Shivering (D) Both A and B
6	pBR 322 would enable separating out colonies of bacteria in a medium containing : (A) Tetracycline (B) Ampicillin (C) Gel (D) Both A and B
7	Sarcoplasmic reticulum surround each : (A) Myofilament (B) Myofibril (C) Sarcomere (D) Both A and B
8	The position of a gene on the chromosome is called its : (A) Locus (B) Genotype (C) Phenotype (D) All of these
9	Fresh water ecosystem covers less than : (A) 10% (B) 05% (C) 02% (D) 01%
10	The epiblast is presumptive : (A) Ectoderm (B) Mesoderm (C) Endoderm (D) Both A and B
11	The membrane that bounds vacuole is called : (A) Tonoplast (B) Symplast (C) Apoplast (D) All of these
12	Chromosomal part which uncoils during interphase is called : (A) Euchromatin (B) Heterochromatin (C) Chromatin (D) Both A and B
13	A plant has a growth pattern called : (A) Closed growth (B) Open growth (C) Primary growth (D) Secondary growth
14	Autosomal non-disjunction may occur in other than : (A) 20^{th} chromosome (B) 21^{st} chromosome (C) 23^{rd} chromosome (D) None of these
15	The normal speed of nerve impulse in human is --- per second : (A) 100 m / sec (B) 120 m / sec (C) 150 m / sec (D) None of these
16	During PCR thermostable enzyme is used named as : (A) DNA polymerase (B) Taq polymerase (C) Both A and B (D) None of these
17	The actual location of place where an organism lives is called : (A) Biosphere (B) Lithosphere (C) Atmosphere (D) Habitat

Roll No _____ (To be filled in by the candidate)

(Academic Sessions 2018 – 2020 to 2020 – 2022)

BIOLOGY 222-(INTER PART – II) Time Allowed : 2.40 hours

PAPER – II (Essay Type) GROUP – I Maximum Marks : 68

SECTION – I LHR-G1-22

2. Write short answers to any EIGHT (8) questions : **16**

(i) How animals of hypotonic environment osmoregulate? Give examples.
(ii) Animals excrete nitrogenous wastes with digestive feces. Give example and significance of this adaptation.
(iii) How land animals trap a thick layer of air around the body? Give its significance.
(iv) What is Ecdysis?
(v) Differentiate Hinge Joint and Ball and Socket joint by giving example.
(vi) What is arthritis?
(vii) Define seed dormancy. Give its significance.
(viii) Can we find a fruit without seeds? Give example.
(ix) What is eutrophication?
(x) Differentiate between prairies and savanna.
(xi) Define soil. Give its basic constituents.
(xii) What are industrial effluents? Give their two effects.

3. Write short answers to any EIGHT (8) questions : **16**

(i) What happens when an impulse reaches a synaptic knob?
(ii) Elaborate habituation as simplest form of learning.
(iii) Give negative effects of nicotine.
(iv) What is a sex limited trait?
(v) State sexual dimorphism in drosophila.
(vi) Define linkage group.
(vii) How gene therapy helps cancer patients?
(viii) What are molecular scissors? How were they obtained?
(ix) Write down the role of lambda phages as a vector.
(x) Interpret the role of decomposers in recycling.
(xi) Compare hydrosere with that of xerosere.
(xii) What is parasitism? Write down its importance.

4. Write short answers to any SIX (6) questions : **12**

(i) Compare gastrulation and organogenesis.
(ii) How inhibitory effect and compensatory effect are caused?
(iii) What is Karyotype? Give its application in species recognition.
(iv) Give the composition of chromosomes.
(v) Differentiate between heterochromatin and euchromatin.
(vi) What is mitotic apparatus?
(vii) How cancer cells can be distinguished from normal cells?
(viii) What is modern synthesis or Neo-Darwinism?
(ix) What are analogous organs? Give example.

SECTION – II

Note : Attempt any THREE questions.

5. (a) Discuss the temperature classification of animals. 4
   (b) Discuss nitrogen depletion and its remedies. 4
6. (a) Compare sclerenchyma cells with collenchyma cells. 4
   (b) What is transcription? How it is carried out in cell? 4
7. (a) Explain the steps of that mechanism which maintains the concentration of secretions in the body. 4
   (b) Write a note on ozone depletion. 4
8. (a) Describe the phenomena of fruit set and fruit ripening. 4
   (b) Explain the process of crossing over with the help of diagram. 4
9. (a) Define and explain embryonic induction. 4
   (b) $p + q = 1$
   Argue that this balance shown in theorem may not vary for a non-evolving population? 4

Roll No. _____ (To be filled in by the candidate)

(Academic Sessions 2018 – 2020 to 2020 – 2022)

BIOLOGY 222-(INTER PART – II) Time Allowed : 20 Minutes

Q.PAPER – II (Objective Type) GROUP – II Maximum Marks : 17

LHR-G2-22

PAPER CODE = 8468

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	Among the scientists who believed in divine creation was :			
	(A) Charles Darwin	(B) Alfard Wallace		
	(C) Carolus Linnaeus	(D) Jean Lamarck		
2	Particular array of chromosomes that an individual possesses is called :			
	(A) Holotype	(B) Karyotype	(C) Neotype	(D) Paratype
3	The total gestation period (pregnancy) is usually about :			
	(A) 250 days	(B) 260 days	(C) 270 days	(D) 280 days
4	Number of linkage groups in man is :			
	(A) 20	(B) 22	(C) 21	(D) 23
5	The most critical phase of mitosis is :			
	(A) Prophase	(B) Metaphase	(C) Anaphase	(D) Telophase
6	The structures that lack secondary wall are :			
	(A) Fibers	(B) Sclerenchyma	(C) Parenchyma	(D) Collenchyma
7	Treasure of all type of resources is :			
	(A) Weather	(B) Climate	(C) Environment	(D) Water
8	In microcephaly, the individuals are born with small :			
	(A) Eyes	(B) Legs	(C) Hands	(D) Skull
9	A powerful tool of forensic science is a test :			
	(A) RNA	(B) DNA	(C) mRNA	(D) tRNA
10	The most concentrated environment is termed as :			
	(A) Hypertonic	(B) Isotonic	(C) Hypotonic	(D) Peritonic
11	Bivalents or tetrads are formed in :			
	(A) Zygotene	(B) Leptotene	(C) Pachytene	(D) Diakinesis
12	The dissolving cells are called :			
	(A) Stem cells	(B) Osteoclast	(C) Osteoblast	(D) Osteocytes
13	The study of single population's relationship to environment is called :			
	(A) Autecology	(B) Synecology	(C) Ecology	(D) Gerantology
14	Viral infections can be diagnosed by :			
	(A) PCR	(B) Cloning	(C) Translation	(D) Transformation
15	In Sindh, the desert ecosystem is called :			
	(A) Thal	(B) Sahara	(C) Thar	(D) Ghobi
16	Acetabularia is unicellular :			
	(A) Fungus	(B) Alga	(C) Yeast	(D) Protozoa
17	Hormone that suppresses ovulation is :			
	(A) Testosterone	(B) Oestrogen	(C) Progesterone	(D) Gastrin

Roll No 2 (To be filled in by the candidate)

(Academic Sessions 2018 – 2020 to 2020 – 2022)

BIOLOGY 222-(INTER PART – II) Time Allowed : 2.40 hours

PAPER – II (Essay Type) GROUP – II Maximum Marks : 68

SECTION – I LHR-G2-22

2. Write short answers to any EIGHT (8) questions : **16**

(i) What components of internal environment are affected by external fluctuations? How are these corrected?
(ii) What may happen to a cell when placed in a hypotonic environment and then in a hypertonic environment?
(iii) Justify the statement, " Excretion of uric acid in some terrestrial animals is an adaptation to conserve water".
(iv) Compare sapwood and heartwood.
(v) Write the name of unpaired bones of human cranium and face.
(vi) What is osteoporosis? How is it treated?
(vii) How do plants detect light or dark period?
(viii) What is vernalin? How is it produced in plants?
(ix) What do you mean by the productivity of an ecosystem? How is it determined?
(x) What kind of soil conditions are found in grassland ecosystem?
(xi) What is nutrient cycle? How is this cycle disturbed?
(xii) Write the sources and harmful effects of CFCs and SO_2.

3. Write short answers to any EIGHT (8) questions : **16**

(i) How plants respond to stimuli?
(ii) In what way nerve impulse triggers the action potential?
(iii) How different modalities of sensation work?
(iv) What are multiple alleles? Mention their presence in diploid and haploid organisms.
(v) What is test cross? Write down its uses.
(vi) Differentiate between gene linkage and linkage group.
(vii) Write two possible ways to get genes.
(viii) What are plasmids? Give their two examples.
(ix) Write down the two uses of PCR amplification.
(x) Differentiate between autecology and synecology.
(xi) How the trophic levels are involved in the flow of energy?
(xii) What is prey and predator interaction? Write its significance.

4. Write short answers to any SIX (6) questions : **12**

(i) How are area pellucida and area opaca developed?
(ii) The number of older individuals are expected to rise in humans, discuss.
(iii) Why does every genetic code consists of three nucleotides?
(iv) What do you know about the minimal medium used by Beadle and Tatum?
(v) Describe promoter area in transcription.
(vi) Describe mitotic apparatus.
(vii) Describe Turner's syndrome.
(viii) Differentiate between homologous and analogous structures.
(ix) Define Hardy Weinberg Theorem.

SECTION – II

Note : Attempt any THREE questions.

5. (a) Explain in detail the adaptations in plants to high and low temperature. 4
   (b) What is food web? Give its significance. Draw a food web. 4
6. (a) Explain some major functions of skeletal system in maintenance of human life. 4
   (b) Discuss chemical nature of DNA with reference to nucleoside and nucleotide composition. 4
7. (a) Describe major factors which restore resting membrane potential in a neuron after passage of a nerve impulse. 4
   (b) Discuss the importance of forests for human. 4
8. (a) Discuss sexually transmitted diseases. How can these be controlled? 4
   (b) Write an essay on crossing over. 4
9. (a) Discuss abnormal development due to environmental factors and metabolic defects. 4
   (b) Explain natural selection and artificial selection as evidence of evolution. 4

LHR-I-21

Roll No. _____ (To be filled in by the candidate)

(Academic Sessions 2017 – 2019 to 2019 – 2021)

BIOLOGY 221-(INTER PART – II) Time Allowed : 20 Minutes

Q.PAPER – II (Objective Type) GROUP – I Maximum Marks : 17

PAPER CODE = 8463

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	Nissl's granules are group of : (A) Mesosomes (B) Lysosomes (C) Ribosomes (D) Chromosomes
2	Morphological characteristics of chromosomes are collectively called : (A) Karyotype (B) Neotype (C) Holotype (D) Phenotype
3	According to endosymbiont hypothesis, the aerobic bacteria developed into : (A) Ribosome (B) Lysosome (C) Mitochondria (D) Plastids
4	Establishment of new forests, where no forests existed before is called : (A) Reforestation (B) Afforestation (C) Deforestation (D) Desertification
5	Contractile vacuoles are found in : (A) Plants (B) Fresh water protozoa (C) Land animals (D) Land plants
6	Locus is : (A) Part of DNA (B) Position of gene (C) Partner of gene (D) Part of gene
7	The process of moulting is controlled by enzyme called : (A) Ecdysone (B) Aldosteron (C) Oxytocin (D) Androgen
8	Full cell cycle in yeast cells has length of : (A) 30 minutes (B) 60 minutes (C) 90 minutes (D) 120 minutes
9	The abiotic component of an ecosystem is : (A) Temperature (B) Producer (C) Consumer (D) Decomposer
10	Immediately after fertilization, the egg under goes some series of mitotic divisions called : (A) Morulla (B) Blastula (C) Gastrulation (D) Cleavage
11	In 1 gm of ammonia nitrogen requires how much water for excretion : (A) 50 mℓ (B) 100 mℓ (C) 200 mℓ (D) 500 mℓ
12	Hatching period of chick is : (A) 15 days (B) 20 days (C) 21 days (D) 25 days
13	Which one is the type of asexual reproduction : (A) Apomixes (B) Vernalization (C) Fertilization (D) Phototropism
14	DNA synthesis and chromosomal doubling occurs in : (A) G_1 - phase (B) G_2 - phase (C) G_0 - phase (D) S - phase
15	Mature bone cells are called : (A) Osteoblast (B) Osteocytes (C) Osteoclasts (D) Chondrocytes
16	The enzyme which joins the two pieces of DNA is : (A) DNA ligase (B) DNA polymerase (C) Endo nuclease (D) Lipase
17	Which of the following is vestigial organ of whole : (A) Gills (B) Leg bones (C) Lungs (D) Pelvis and leg bones

LHR-I-21

(To be filled in by the candidate)

(Academic Sessions 2017 – 2019 to 2019 – 2021)

BIOLOGY 221-(INTER PART – II) Time Allowed : 2.40 hours

PAPER – II (Essay Type) GROUP – I Maximum Marks : 68

SECTION – I

2. Write short answers to any EIGHT (8) questions : 16

(i) Differentiate between hydrophytes and mesophytes.
(ii) What are osmoconformers and osmoregulators animals?
(iii) How vasodilation differ from vasoconstriction?
(iv) Define ecdysis or moulting, give its two stages.
(v) Differentiate between troponin and tropomyosin.
(vi) Give two functions of skeletal system.
(vii) Define seed dormancy. Write its two significance.
(viii) Define oviparous and viviparous animals.
(ix) What is profundal zone?
(x) How many biomes are present in the World, name any four of them.
(xi) Differentiate between deforestation and reforestation.
(xii) Define eutrophication, give its one effect upon animal life.

3. Write short answers to any EIGHT (8) questions : 16

(i) Differentiate between kinesis and taxes.
(ii) Write the role of progesterone.
(iii) What is Addison's disease?
(iv) What is gene and its locus?
(v) What is dihybrid cross?
(vi) Write dominant and recessive trait.
(vii) What are three possible ways to get a gene?
(viii) Write the role of Lambda phage as a vector.
(ix) Write any two uses of PCR.
(x) What is Niche, explain according to Charles Eltan?
(xi) What are decomposers?
(xii) Write crustose lichens in xerosere.

4. Write short answers to any SIX (6) questions : 12

(i) Define growth and development.
(ii) Define teratogens. Give two examples.
(iii) Draw structural formula of nucleotide.
(iv) Differentiate between leading strand and lagging strand.
(v) Define transformation. In which bacterium it was discovered?
(vi) What are cancer cells? How cancer cells can be distinguished from normal cells?
(vii) What is meant by non-disjunction? Write its consequences.
(viii) Differentiate between homologous and analogous organs.
(ix) How the oxygen accumulation liberated during photosynthesis changed the environment of earth?

SECTION – II

Note : Attempt any THREE questions.

5. (a) Give the homeostatic roles of liver in the form of a table. 4
   (b) Define ecosystem. Discuss its components and their interaction. 4
6. (a) Write down four phases in the repair process of a fracture. 4
   (b) Write a note on genetic code. 4
7. (a) Explain structure and function of forebrain in man. 4
   (b) Write a note on algal bloom or eutrophication. 4
8. (a) Write a note on identical twins and fraternal twins. 4
   (b) Write a note on diabetes mellitus. 4
9. (a) Describe the types of meristems. 4
   (b) Explain the evidences of evolution by fossil record and comparative anatomy. 4

LHR-II-21

_____ (To be filled in by the candidate)

(Academic Sessions 2017 – 2019 to 2019 – 2021)

BIOLOGY 221-(INTER PART – II) Time Allowed : 20 Minutes

Q.PAPER – II (Objective Type) GROUP – II Maximum Marks : 17

PAPER CODE = 8464

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	The part of the brain which is best developed in birds : (A) Cerebellum (B) Medulla (C) Hippocampus (D) Pons
2	If the centromere is located in the middle of the chromosome it is called : (A) Metacentric (B) Sub metacentric (C) Telocentric (D) Acrocentric
3	The actual remains or traces of organisms that lived in the ancient geological times are called : (A) Analogous organs (B) Homologous organs (C) Vestigial organs (D) Fossils
4	The rain fall less than 25 to 50 cm is found in : (A) Desert (B) Grassland (C) Temperate deciduous forest (D) Tropical rain forest
5	The blood passing through glomerulus is filtered into : (A) Bowman's capsule (B) Ureter (C) Bladder (D) Urethra
6	The Ginkgo plant is : (A) Monoecious (B) Dioecious (C) Triecious (D) Polyecious
7	In plant cell turgor pressure is generated by : (A) Cell wall (B) Cell membrane (C) Mitochondria (D) Vacuole
8	XYY condition is found in : (A) Patau (B) Edward (C) Turner (D) Jacobs
9	In Pakistan grassland ecosystem is found in : (A) Kara Koram (B) Shogran (C) Malam Jabba (D) North Kallat
10	In the development of chick the 24 hours embryo is called : (A) Morulla (B) Gastrula (C) Blastula (D) Neurula
11	The hormone which actively transport water from filtrate in collecting tubules back to kidney is : (A) Aldosterone (B) ADH (C) Testosteron (D) Oxytocine
12	Healing of fracture and repair of the skin wound is example of : (A) Meiosis (B) Regeneration (C) Development (D) Necrosis
13	The follicle cells after release of the egg are modified to form special structure called : (A) Follicle atresia (B) Corpus luteum (C) Uterus (D) Placenta
14	The stage which may lasts for days, weeks or even years is : (A) Leptotene (B) Zygotene (C) Pachytene (D) Diplotene
15	Which one of the following is a facial bone : (A) Frontal (B) Occipital (C) Vomer (D) Sternum
16	The patients lack a gene that code for trans-membrane carrier of the chloride ions : (A) Cancer (B) ADA (C) SCID (D) Cystic fibrosis
17	Which of the following is biotic factor : (A) Topography (B) Gravity (C) Soil energy (D) Decomposers

LHR-I-21

No _____ (To be filled in by the candidate)

(Academic Sessions 2017 – 2019 to 2019 – 2021)

BIOLOGY 221-(INTER PART – II) Time Allowed : 2.40 hours

PAPER – II (Essay Type) GROUP – II Maximum Marks : 68

SECTION – I

2. Write short answers to any EIGHT (8) questions : **16**

(i) Differentiate between osmoconformers and osmoregulators.
(ii) Define uremia. What is its permanent treatment?
(iii) Define pyrexia and pyrogens.
(iv) Define Herniation of disc. How is it treated?
(v) Differentiate between bone and cartilage.
(vi) Give two modifications in the exoskeleton of arthropods.
(vii) What is seed dormancy? Write its significance.
(viii) Write the functions of sertoli cells and interstitial cells.
(ix) Characterize limnetic zone and profundal zone of fresh water lake.
(x) Write down the name of two dominant plants and two dominant animals of temperate deciduous forest.
(xi) What is nutrient cycle? What is driving force behind these cycles?
(xii) Write four effects of removal of forests.

3. Write short answers to any EIGHT (8) questions : **16**

(i) What condition result due to hypo and hyper function of cortical hormones?
(ii) Write the actions of nicotine on nervous and circulatory system.
(iii) Define imprinting with the example of precocial birds.
(iv) Differentiate between X-linked dominant and X-linked recessive traits.
(v) Define monohybrids and dihybrids.
(vi) Define linkage. Enlist linkage groups of chromosome no. 11 and 23.
(vii) What do you know about palindromic sequence? Give an example.
(viii) What are protoplasts? Give scientific name of biodegradable plastic.
(ix) Give the process of coronary artery angioplasty briefly, using biotechnology.
(x) Differentiate between food chain and food web.
(xi) Define ammonification and nitrification.
(xii) State parasitism and its significance.

4. Write short answers to any SIX (6) questions : **12**

(i) Define apical meristem.
(ii) What is inhibitory effect?
(iii) Define transcription.
(iv) Differentiate between heterochromatin and euchromatin.
(v) What are three main components of a DNA?
(vi) Differentiate between leptotene and zygotene.
(vii) Explain Turner's syndrome.
(viii) How genetic drift effect gene frequency?
(ix) What are homologous organs?

SECTION – II

Note : Attempt any THREE questions.

5. (a) Explain the structure of nephron. 4
   (b) Describe predation and parasitism with their significance. 4
6. (a) Write a note on sclerenchyma cells and collenchyma cells. 4
   (b) Explain Watson and Crick Model of DNA. 4
7. (a) What is resting membrane potential? How is resting membrane potential maintained across neurolema? 4
   (b) Describe the importance of forests. 4
8. (a) Describe fruit set and fruit ripening in angiosperms. 4
   (b) What is X-linked recessive inheritance? Explain it with an example. 4
9. (a) Describe various types of meristems. 4
   (b) How did eukaryotes evolve from prokaryotes? 4