



Roll No. \_\_\_\_\_ (To be filled in by candidate)

**(NEW PATTERN)**

Paper Code 8 4 6 1

**Biology** (Objective Type)**Sessions; 2012-2014 & 2013-2015****Time: 20 Minutes****Marks: 17**

NOTE: Write answers to the questions on the objective answer sheet provided. Four possible answers

A, B, C and D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. The plants that have adaptation of small and thick leaves to reduce water loss are called:  
(A) Hydrophytes (B) Mesophytes (C) Xerophytes (D) Hygrophytes
2. The excretory product that require minimum water for its elimination is:  
(A) Urea (B) Uric acid (C) Ammonia (D) Creatinine
3. Muscle fatigue is caused by:  
(A) CO<sub>2</sub> (B) Fumaric acid (C) Ethyl alcohols (D) Lactic acid
4. Which of the following animal has hydrostatic skeleton.  
(A) Man (B) An insect (C) Sea anemone (D) Fish
5. Which of the hormone suppresses ovulation.  
(A) Testosterone (B) Oestrogen (C) Gastrin (D) Progesteron
6. Reproduction is very important to the survival of:  
(A) Species (B) Individual (C) Community (D) both A & B
7. External fertilization occurs in:  
(A) Terrestrial environment (B) Aquatic environment  
(C) In the reproductive tract of female (D) none
8. In which developmental stage, germs layers are formed:  
(A) Morulla (B) Blastulation (C) Gastrulation (D) Neurulation
9. The sequence of nucleotides that determines the aminoacid sequence of a protein is called:  
(A) Allele (B) Multiple allele (C) Chromosome (D) Gene
10. Mongolism is also known as:  
(A) Down's syndrome (B) Klinefelter's syndrome (C) Turner's syndrome (D) Jacob's syndrome
11. Bivalents or Tetrads are formed in:  
(A) Leptotene (B) Zygotene (C) Pachytene (D) Diaknesis
12. Chances of genetic recombination are minimized due to:  
(A) Crossing over (B) Independent assortment of chromosomes  
(C) Mutation (D) Gene linkage
13. Which of the enzymes act as molecular scissors.  
(A) DNA ligase (B) Restriction Endonucleases  
(C) DNA polymerase (D) RNA polymerase
14. Who published an essay on "The principle of population"?  
(A) Lyell (B) Darwin (C) Malthus (D) Mendel
15. Study of single population's relationship to environment is called:  
(A) Autecology (B) Synecology (C) Ecology (D) Gerantology
16. Which of the biomes has been increased in area by human activities.  
(A) Sawana (B) GrassLand (C) Coniferous (D) Desert
17. Which of the following is a renewable resource.  
(A) Coal (B) Land  
(C) Petroleum (D) Natural gas

Roll No. \_\_\_\_\_ (to be filled in by the candidate)

(NEW PATTERN)

Subject Code 6 0 4 6

**Biology** (Essay Type)

Sessions; 2012-2014 &amp; 2013-2015

Time: 3:10 Hours

**Section - I**

Marks: 83

**2. Write short answers of any eight parts from the following.**

2x8=16

- i. What is peritoneal dialysis? Explain.
- ii. Briefly describe urea cycle.
- iii. Write a note on kidney transplantation.
- iv. How does Tendon differ from Ligament?
- v. Differentiate between sap wood and heart wood.
- vi. What are disadvantages of Exoskeleton?
- vii. How Cytokinesis occurs in plants?
- viii. Differentiate between apical and lateral meristems.
- ix. What do you know by Turner's Syndrome?
- x. What events occur in anaphase of mitosis?
- xi. What is Neo-Darwinism?
- xii. Differentiate between Endangered and Threatened species.

**3. Write short answers of any eight parts from the following.**

2x8=16

- i. What are Biological rhythms?
- ii. Define neurotransmitters and give examples.
- iii. What is midbrain's reticular formation?
- iv. How process of child birth is initiated in human?
- v. Define Gestation period and after birth.
- vi. What is Oestrous cycle?
- vii. What are restriction endonucleases?
- viii. What are Plasmids? Give their role.
- ix. What is industrial effluent? Give its impact.
- x. Name three deserts of Pakistan and their location.
- xi. Differentiate between aquatic and terrestrial ecosystem.
- xii. Discriminate between normal health and diseases.

**4. Write short answers of any six parts from the following.**

2x6=12

- i. Define Niche.
- ii. Differentiate between Euchromatin and Heterochromatin.
- iii. Write contribution of Rosalind Franklin.
- iv. What are Polygenic Traits? Give two examples in humans.
- v. Differentiate between Linkage and crossing over.
- vi. Differentiate between a Food chain and a Food web.
- vii. What would be the sex of a Drosophila and a Human with XXY chromosomes.
- viii. What is difference between Biotic and Abiotic components? Give examples of Abiotic components.
- ix. Give various types of chromosomes depending upon location of centromere.

**Section - II****NOTE: Answer any three questions from the following.**

8x3=24

5. (a) Explain pleiotropy with the help of examples. (b) What is aging? How will you explain this process? 4+4=8
6. (a) What are the functions of placenta during pregnancy? 4
- (b) How did Meselson and Stahl show that DNA replication is semiconservative? 4
7. (a) Differentiate between Sclerenchyma cells and collenchyma cells and sketch their diagrams. 4
- (b) Describe factors affecting gene frequency. 4
8. (a) Define osmoregulation and describe osmoregulation in plants. 4
- (b) Describe the water and Land as renewable resources. 4
9. (a) Describe role and commercial applications of Auxins. 4
- (b) Define succession. Explain different stages of xerosere. 4

**Section -III (Practical)****NOTE: Answer any three parts from the following.**

5x3=15

- 10.A Sketch and Label the male reproductive system of frog. 5
- B. Make the labelled diagram of urostyle of frog. 5
- C. Write down the procedure to study mitosis in onion root tips. Draw the metaphase and telophase stage. 5
- D. Draw and label the structure of hen's egg. 5
- E. Write down short answers of the following:- 1x5=5
- (i). How much energy is passed from one trophic level to other trophic level?
- (ii). What is difference between positive and negative phototropism?
- (iii) Define muscle twitch.
- (iv) Give position of Nervous system in Cockroach. (v) Give behaviour of chromosome during metaphase





Roll No. \_\_\_\_\_ (To be filled in by candidate)

(OLD PATTERN)

Paper Code	4	4	6	1
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**Biology** (Objective Type)

Session;2011-2013

Time: 20 Minutes

Marks: 17

NOTE: Write answers to the questions on the objective answer sheet provided. Four possible answers A,B,C and D to each question are given. Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. A pair of kidneys consists of millions of functional units are called:  
(A) Nephrons (B) Neurons (C) Dendrons (D) none of these
2. The excretory product that requires maximum water for its elimination as compared to other is:  
(A) Ammonia (B) Urea (C) Uric acid (D) Creatinine
3. Euglena moves with the help of:  
(A) Cilium (B) Flagellum (C) Pseudopodium (D) Myonemes
4. The disease caused by low calcium in the blood is:  
(A) Cramp (B) Tetany (C) Muscle fatigue (D) none of these
5. Abscisic acid can be sprayed on tree crops to regulate.  
(A) Shoot drop (B) Fruit drop (C) Cone drop (D) Leaf drop
6. Nociceptors produce the sensation of:  
(A) Touch (B) Pain (C) Warmth (D) Pressure
7. A type of asexual reproduction in which parent organism simply divides into two daughter organisms is:  
(A) budding (B) multiple fission (C) binary fission (D) nuclear fission
8. Mammals are:  
(A) Oviparous (B) Ovoviviparous (C) Viviparous (D) both A & B
9. The cavity formed between somatic and splanchnic mesoderm is:  
(A) Blastocoele (B) Gastrocoele (C) Neurocoele (D) Coelom
10. RNA polymerase I synthesizes:  
(A) r RNA (B) m RNA (C) t RNA (D) Protein
11. Karyokinesis involves the division of:  
(A) Cytoplasm (B) Whole cell (C) Mitochondria (D) Nucleus
12. A women can be bald only when she is:  
(A) Homozygous dominant (B) Hetrozygous (C) Homozygous recessive (D) none
13. One common type of vector is a:  
(A) Chromosome (B) Lysosome (C) Mitochondria (D) Plasmid
14. A respiratory protein found in all aerobic species is:  
(A) Cytochrome a (B) Cytochrome b  
(C) Cytochrome c (D) Cytochrome d
15. The relationship between insects and flowering plants is the example of:  
(A) Commensalism (B) Mutualism (C) Predation (D) Parasitism
16. In Sindh, the desert ecosystem is called:  
(A) Thar (B) Thal (C) Sahara (D) Ghobi
17. The natural heat energy trapped underground is called:  
(A) Hydro-electric energy (B) Thermal energy (C) Geo energy (D) Geothermal energy

Roll No. \_\_\_\_\_ (to be filled in by the candidate)

(OLD PATTERN)

Subject Code 4 4 6

**Biology** (Essay Type)

Session;2011-2013

Time: 2:40 Hours

**Section - I**

Marks: 68

2. Write short answers of any eight parts from the following.

2x8=16

- i. What do you know about biological rythms.
- ii. How bony fishes osmoregulate?
- iii. How loss of salt is compensated in fresh water animals.
- iv. What is after birth?
- v. Differentiate between sap wood and heart wood.
- vi. Define chlorosis.
- vii. What do you know about diploid parthenogenesis?
- viii. Write two adaptations of Hydrophytes.
- ix. Differentiate between oviparous and viviparous.
- x. Define Nociceptors.
- xi. Write two differences between sclerenchyma and collenchyma.
- xii. Write down mechanism of Rapid movement of leaflets.

3. Write short answers of any eight parts from the following.

2x8=16

- i. Give role of red, blue and ultraviolet lights in growth.
- ii. What is embryonic induction?
- iii. Differentiate between Heterochromatin and Euchromatin.
- iv. Differentiate between climate and weather.
- v. Why Vernon Ingram is famous for?
- vi. Define metastasis.
- vii. What are palindromic sequences?
- viii. What are hydrothermal vents?
- ix. Differentiate between homologous and analogous organs.
- x. Define Hardy-weinberg theorem.
- xi. What is semi-conservative model of DNA replication?
- xii. Differentiate between savanna and prairies.

4. Write short answers of any six parts from the following.

2x6=12

- i. What is Test Cross? Give its role.
- ii. What is Erythroblastosis foetalis?
- iii. Why T.H.Morgan select Drosophila for genetic studies?
- iv. What is Biome? Give its types.
- v. What is the role of food web?
- vi. What are the effects of over and under grazing?
- vii. What is nutrient cycle? How it can be upset?
- viii. What are the roles of fossil fuels?
- ix. What are the causes and effects of green house effect?

**Section - II**

NOTE: Answer any three questions from the following.

8x3=24

- 5. (a) Describe excretion in cockroach. 4
- (b) Define succession. Explain forms of succession. 4
- 6. (a) Explain the ultrastructure of Myofilament along with diagram. 4
- (b) List some adaptations of: (a). desert plants. (b). desert animals to heat and drought. 4
- 7. (a) Explain the hormones and their roles, produced from the anterior pituitary lobe. 4
- (b) Describe air, water and land as renewable resources. 4
- 8. (a) What is the role of phytochromes in photoperiodism? 4
- (b) Discuss different patterns of sex determination in animals. 4
- 9. (a) Discuss chemical nature of DNA. 4
- (b) Compare Down's syndrome with Klinefelter's syndrome. 4





Roll No. \_\_\_\_\_ (To be filled in by candidate)

Paper Code	8	4	6	7
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**Biology** (Objective Type)**Sessions; 2012-2014, 2013-2015 & 2014-2016****Time: 20 Minutes****Marks: 17**

NOTE: Write answers to the questions on the objective answer sheet provided. Four possible answers

A, B, C and D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with Marker or pen ink on the answer sheet provided.

- 1.1. Any group of inter breeding organisms of the same species that exist together in both time and space is called:  
(A) Genepool (B) Population (C) True breeders (D) Multiple alleles
2. Green colorblindness is called:  
(A) Protonopia (B) Deuteronopia (C) Tritanopia (D) Protanomalous
3. Alfred Wallace developed a theory of natural selection essentially identical to:  
(A) Linnaeus's (B) Darwin's (C) Lamark's (D) Mendel's
4. In Sindh the desert ecosystem is called:  
(A) Thar (B) Thal (C) Sahara (D) Gobi
5. The animal that is caught and eaten is called:  
(A) Predator (B) Prey (C) Host (D) Parasite
6. Ozone Molecule is made up by binding of three atoms of:  
(A) Nitrogen (B) Hydrogen (C) Oxygen (D) Carbon
7. The protection of internal environment from the harms of the fluctuation in external environment is termed as:  
(A) Osmoregulation (B) Thermoregulation (C) Excretion (D) Homeostasis
8. Animals of the group of flat worms have simple tubular excretory system called as:  
(A) Kidney (B) Nephron (C) Nephridian (D) Protonephridium
9. Seven vertebrae which lie in the neck region is called:  
(A) Lumbar region (B) Thoracic region (C) Pelvic region (D) Cervical region
10. The joint that allows the movements in two directions is called:  
(A) Cartilaginous joints (B) Synovial joints (C) Hinge joints (D) Ball and socket joint
11. The processes conducting impulses away from the cell body are called:  
(A) Dendrites (B) Dendron (C) Nissl's granules (D) Axon
12. The end or complete stop of the menstrual cycle is called:  
(A) Menopause (B) Emotional stress  
(C) Mal nourishment effect of cycle (D) Menstruation
13. The animals that lay shelled eggs to protect the developing embryo from harsh terrestrial conditions are called:  
(A) Oviparous (B) Viviparous (C) Ovoviviparous (D) Egg laying mammals
14. Immediately after fertilization, the egg undergoes a series of mitotic divisions called:  
(A) Morulla (B) Gastrulation (C) Cleavage (D) Blastula
15. DNA was discovered in:  
(A) 1869 (B) 1864 (C) 1961 (D) 1971
16. The period of life cycle of cell between two consecutive divisions is termed as:  
(A) Resting Phase (B) Inter Phase (C) G1 Phase (D) G2 Phase
17. Synapsis takes place in:  
(A) Leptotene (B) Zygotene (C) Pachytene (D) Anaphase

Roll No. \_\_\_\_\_ (to be filled in by the candidate)

Sessions; 2012-2014, 2013-2015 & 2014-2016

## Biology (Essay Type)

Time: 3:10 Hours

### Section - I

Marks: 83

2. Write short answers of any eight parts from the following.

2x8=16

- |   |  |
|---|--|
| i. Define Homeostasis.                    | ii. Describe the structure of a flame cell.                      |
| iii. What are juxtamedullary nephrons?    | iv. Differentiate between Heart wood and Sap wood.               |
| v. What is rickets and what is its cause? | vi. Differentiate between Fibro cartilage and hyaline cartilage. |
| vii. Define embryonic induction.          | viii. Differentiate between vascular and cork cambium.           |
| ix. What is chromosomal non-disjunction?  | x. What is interphase? Write the names of its substages.         |
| xi. What is theory of special creation?   |  |
| xii. Define Hardy Weinberg theorem.       |  |

3. Write short answers of any eight parts from the following.

2x8=16

- |  |   |
|--|---|
| i. Sketch and label sensory neuron .                         | ii. Define nerve impulse.                                     |
| iii. Give role of human gut as endocrine tissue.             | iv. What are fraternal twins?                                 |
| v. Write a note on test tube babies.                         | vi. Differentiate between menstrual cycle and oestrous cycle. |
| vii. What is prob? Give its role.                            | viii. Define hybridization.                                   |
| ix. Give biological name of Rhesus monkey.                   | x. Give productivity in sub humid tropical grass land.        |
| xi. How can you conserve energy?                             |   |
| xii. Name two Air pollutants and give their harmful effects. |   |

4. Write short answers of any six parts from the following.

2x6=12

- |   |  |
|---|--|
| i. What is meant by promoter?                             | ii. What is Genetic code?                  |
| iii. What do you know about point mutation?               | iv. Differentiate between Gene and Allele. |
| v. What is Hydrosene and Xerosene?                        | vi. What is Nullo Gamete?                  |
| vii. What do you know about the term Ecosystem?           |  |
| viii. Differentiate between habitat and ecological niche. |  |
| ix. What do you know about protanopia and tritanopia?     |  |

### Section - II

NOTE: Answer any three questions from the following.

8x3=24

- |   |       |
|---|-------|
| 5. (a) Discuss the structure and function of Nephron. (b) Highlight the importance of forests.                      | 4+4=8 |
| 6. (a) Explain sliding filament model of muscle contraction.  | 4     |
| (b) Write down the main points of theory of natural selection.  | 4     |
| 7. (a) Discuss working of sensory receptors with special reference to skin.   | 4     |
| (b) Explain food web with diagram.  | 4     |
| 8. (a) Define Photoperiodism. Give classification of plants according to photo periodic requirements for flowering. | 4     |
| (b) Explain Meselson-Stahl experiment.  | 4     |
| 9. (a) What is growth? Discuss different phases of growth.  | 4     |
| (b) What is incomplete dominance? Explain with the help of an example.  | 4     |

### Section -III (Practical)

NOTE: Answer any three parts from the following.

5x3=15

- |  |      |
|--|------|
| 10.A Sketch and label the nervous system of cockroach.           | 5    |
| B. Draw and label different bones of fore-limb of frog.          | 5    |
| C. Write down procedure to demonstrate phenomenon of geotropism. | 5    |
| D. Investigate the water content of soil sample.                 | 5    |
| E. Write down short answers of the following:-                   | 1x5= |
| (i). What are amphibious kind of hydrophytes?                    |      |
| (ii). Define muscle.   |      |
| (iii) What are the glands with ducts are known as?               |      |
| (iv) Why is the egg-shell porous?                                |      |
| (v) What is meant by balanced ecosystem?                         |      |





Roll No. \_\_\_\_\_ (To be filled in by candidate)

Paper Code	4	4	6	1
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**Session; 2015-2017**  
**Group-I**

**Biology** (Objective Type)

Time: 20 Minutes

Marks: 17

NOTE: Write answers to the questions on the objective answer sheet provided. Four possible answers

A, B, C and D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with Marker or pen ink on the answer sheet provided.

- 1.1. The category of plants that has adaptation of small and thick leaves to limit water loss is called:
 

(A) Hydrophytes	(B) Xerophytes	(C) Mesophytes	(D) Xerophytes
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2. The reabsorption of water in collecting tubules is under the control of:
 

(A) Aldosterone	(B) ADH	(C) Tubular secretion	(D) Pressure filtration
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3. Turgor pressure is generated by osmotic pressure of:
 

(A) Cell cytosol	(B) Cell vacuole	(C) Cytoplasm	(D) Protoplast
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4. Skeletal muscles are called striated (stripped) because of presence of:
 

(A) Red and Yellow band	(B) White and yellow band
(C) Alternating dark and light band	(D) Red and black band
5. Fruit ripening is associated with the burst of respiratory activity called:
 

(A) Glycolysis	(B) Respiration	(C) Krebs cycle	(D) Climacteric
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6. Evolution of pollen tube parallels the evolution of:
 

(A) Embryo	(B) Leaf	(C) Fruit	(D) Seed
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7. Each chromosome when visible consists of two unseparated replicas:
 

(A) Chiasma	(B) Tetrad	(C) Homologous chromosome	(D) Chromatids
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8. The sex chromosomes of the person affected with Klinefelter's syndrome are:
 

(A) XYY	(B) XXX	(C) XXY	(D) XY
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9. Neuroglial cells provide the neuron with:
 

(A) Protection	(B) Support	(C) Locomotion	(D) Nutrition
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10. Apical dominance in plants occurs due to higher concentration of:
 

(A) Cytokinin	(B) Gibberellin	(C) Ethane	(D) Auxin
---------------	-----------------	------------	-----------
11. Number of histone protein molecules in a single nucleosome are:
 

(A) 06	(B) 09	(C) 08	(D) 10
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12. Deuteranopia is a colour blindness of:
 

(A) Red	(B) Blue	(C) Green	(D) Yellow
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13. First restriction enzyme was isolated by:
 

(A) Kary Mullis	(B) Hamilton	(C) Sanger	(D) Mendel
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14. Endosymbiont hypothesis was proposed by:
 

(A) Cuvier	(B) Lyell	(C) Lynn Margulis	(D) Malthus
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15. Who proposed the term niche in ecology:
 

(A) Haeckel	(B) Darwin	(C) Charles Eton	(D) Joseph Grinnel
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16. Alpine coniferous forests are found on high:
 

(A) Latitudes	(B) Longitudes	(C) Altitudes	(D) Slopes
---------------	----------------	---------------	------------
17. The decline in thickness of ozone layer is caused by increasing level of:
 

(A) Hydrocarbon	(B) Nitrocarbon	(C) Chlorofluorocarbon	(D) Chlorine
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Roll No. \_\_\_\_\_ (to be filled in by the candidate)

Session; 2015-2017  
Group-I

**Biology** (Essay Type)

Time: 2:40 Hours

**Section - I**

Marks: 68

2x8=16

2. Write short answers of any eight parts from the following.

- |   |  |
|---|--|
| i. Draw labeled sketch of urea cycle.           | ii. What is metanephridium? In which organism is it found?           |
| iii. What is lithotripsy? Name its common type. | iv. Define secondary growth and give its significance.               |
| v. Give two disadvantages of exoskeleton.       | vi. Describe main types of cartilage.                                |
| vii. Explain briefly the term 'fruit set'.      | viii. Differentiate between identical twins and fraternal twins.     |
| ix. Describe the animal life in Profundal zone. | x. How animals and plants conserve water in terrestrial environment? |
| xi. What are causes of green house effect?      | xii. Differentiate pollution from pollutant.                         |

2x8=16

3. Write short answers of any eight parts from the following.

- |  |   |
|--|---|
| i. What is latent learning? Give an example.                 | ii. Define habituation with an example.                 |
| iii. Elaborate action of nicotine on humans.                 | iv. Differentiate between gene and allele.              |
| v. What is the difference between linkage and linkage group? | vi. How sex is determined in yeast?                     |
| vii. Give two practical uses of DNA printing technology.     | viii. Differentiate between cloning and tissue culture. |
| ix. How hypercholesterolemia can be cured by gene therapy?   | x. Define population and community.                     |
| xi. Define the term biochemistry cycle.                      | xii. What is parasitism? Give its kinds.                |

2x6=12

4. Write short answers of any six parts from the following.

- |  |   |
|--|---|
| i. Differentiate between heterochromatin and euchromatin.                  | ii. What is alkaptonuria?                             |
| iii. Describe semi-conservative model of DNA replication.                  | iv. Define discoidal cleavage.                        |
| v. What is malignant tumor?  | vi. Discuss diakinesis phase of meiosis.              |
| vii. Differentiate between homologous and analogous organs.                | viii. Name four declared extinct animals in Pakistan. |
| ix. How temperature plays important role in the growth of plants? Discuss. |   |

**Section - II**

NOTE: Answer any three questions from the following.

8x3=24

- |   |       |
|---|-------|
| 5. (a) Describe the structure and functions of Nephron.                     | 4     |
| (b) Explain the various stages of xerosene succession on land.              | 4     |
| 6. (a) Discuss methods of locomotion in fish and mammals.                   | 4     |
| (b) What is genetic code? Explain it in detail.                             | 1+3=4 |
| 7. (a) Define reflex-Arc. Explain reflex Arc with an example.               | 4     |
| (b) Write an explanatory note on, "Degradation and depletion of resources". | 4     |
| 8. (a) Describe four sexually transmitted diseases                          | 4     |
| (b) What is incomplete dominance? Explain it with a suitable example        | 4     |
| 9. (a) Discuss the role of Nucleus in development.                          | 4     |
| (b) Write a detailed note on comparative anatomy as evidence of evolution.  |       |





Roll No. \_\_\_\_\_ (To be filled in by candidate)

Paper Code	4	4	6	2
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**Session;2015-2017**  
**Group-II**

**Biology** (Objective Type)

Time: 20 Minutes

Marks: 17

NOTE: Write answers to the questions on the objective answer sheet provided. Four possible answers

A,B,C and D to each question are given. Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1.1. The incidence of Calcium Phosphate stones in humans are:

- (A) 5%                                      (B) 10%                                      (C) 15%                                      (D) 20%

2. The lower two pairs of ribs in humans are called:

- (A) Free ribs                                      (B) Fix ribs                                      (C) Floating ribs                                      (D) Former ribs

3. The thalamus carries sensory information to the limbic system:

- (A) Cerebellum                                      (B) Cerebrum                                      (C) Cerebral                                      (D) Cerebral Cortex

4. The day neutral plant is:

- (A) Soyabean                                      (B) Cabbage                                      (C) Spring barley                                      (D) Cotton

5. The neurula is the stage in which embryo has:

- (A) Blastocoel                                      (B) The germ layers                                      (C) Neural tube                                      (D) Archenteron

6. If the alterations involve only one or a few base pairs in the coding sequence they are called:

- (A) Mutation                                      (B) Point mutation                                      (C) Deletion                                      (D) inversion

7. The period of life cycle of a cell between two consecutive divisions is:

- (A) Prophase                                      (B) Telophase                                      (C) Degree phase                                      (D) Interphase

8. During meiosis the tetrad is formed in:

- (A) Leptotene                                      (B) Zygotene                                      (C) Pachytene                                      (D) Diplotene

9. The maturity on set diabetes of the young is:

- (A) An autosomal dominant trait                                      (B) An autosomal recessive trait  
(C) A sex linked trait                                      (D) A sex influenced trait

10. The cell suspension cultures of Cinchona ledgeriana produces:

- (A) Aspartine                                      (B) Cinchorine                                      (C) Quinine                                      (D) Quina Quina

11. The gene pool consists of all alleles at all gene loci in all individual of:

- (A) Individual                                      (B) Species                                      (C) Population                                      (D) Community

12. In each case succession begins by a few hardy invaders called:

- (A) Gipsies                                      (B) Early settlers                                      (C) Swarmers                                      (D) Pioneers

13. The average rainfall in temperate deciduous forest is:

- (A) 750--1500mm                                      (B) 850--1500mm                                      (C) 950--1500mm                                      (D) 1050--1500m.m

14. The study of human populations and things that effect them is called:

- (A) Remography                                      (B) Demography                                      (C) Temography                                      (D) Dermography

15. The homeostatic thermostate is present in a brain part called:

- (A) Thalamus                                      (B) Hypothalamus                                      (C) Hipocampus                                      (D) Amygdala

16. The inflammatory or degenerative disease that damages joints is called:

- (A) Arithritis                                      (B) Osteoprosis                                      (C) Meningitis                                      (D) Spondylosis

17. The leaf unrolling is promoted by red light in:

- (A) Bryophytes                                      (B) Pteridophytes                                      (C) Dicots                                      (D) Monocots

Roll No. \_\_\_\_\_ (to be filled in by the candidate)

## Biology (Essay Type)

Session; 2015-2017  
Group-II

Time: 2:40 Hours

### Section - I

Marks: 68

2x8=16

2. Write short answers of any eight parts from the following.

- |   |  |
|---|--|
| i. Explain anhydrobiosis with an example.                                 | ii. Define nastic movements. Give its types.             |
| iii. What is cartilage? Give its types.                                   | iv. How genetic deformities of skeleton occur in humans? |
| v. What is apomixes?  | vi. Describe menopause.                                  |
| vii. Differentiate between climate and weather.                           | viii. Define productivity of an aquatic ecosystem.       |
| ix. Give some ways to conserve energy on earth.                           | x. Define pyrexia.                                       |
| xi. What are the sources of chlorofluorocarbon? Give its harmful effects. |  |
| xii. Differentiate between osmoconformers and osmoregulators.             |  |

3. Write short answers of any eight parts from the following.

2x8=16

- |   |  |
|---|--|
| i. Define the term Biological Rhythms.              | ii. What do you know about Nissl's granules?             |
| iii. What is reticular formation?                   | iv. What is epistasis? Give one example.                 |
| v. Differentiate between linkage and linkage group. | vi. What do you know about hypophosphatemic rickets?     |
| vii. What is meant by Genomic library?              | viii. What is the use of dideoxynucleoside triphosphate? |
| ix. What do you know about the term bioreactors?    | x. Define the term ecosystem.                            |
| xi. What is succession?                             | xii. List any four macronutrients.                       |

4. Write short answers of any six parts from the following.

2x6=12

- |   |  |
|---|--|
| i. What are meristems?  | ii. What happened during the organogenesis?                |
| iii. Define Karyotype.  | iv. Differentiate between heterochromatin and euchromatin. |
| v. What are fossils?  | vi. What is the function of mitotic apparatus?             |
| vii. What is Turner's Syndrome?   | viii. State endosymbiont hypothesis.                       |
| ix. Draw shapes of chromosomes depends upon the location of centromere. |  |

### Section - II

NOTE: Answer any three questions from the following.

8x3=24

- |  |   |
|--|---|
| 5. (a) Explain the role of liver as an excretory organ.            | 4 |
| (b) Discuss briefly the two main components of ecosystem.          | 4 |
| 6. (a) Describe nastic movements in plants.                        | 4 |
| (b) Describe the process of transcription.                         | 4 |
| 7. (a) Write note on peripheral nervous system.                    | 4 |
| (b) What do you know about degradation and depletion of resources. | 4 |
| 8. (a) Describe the female reproductive system.                    | 4 |
| (b) Explain erythroblastosis foetalis.                             | 4 |
| 9. (a) Write a note on abnormal development.                       | 4 |
| (b) Write an essay on Lamarckism.                                  | 4 |





Roll No. \_\_\_\_\_ (To be filled in by candidate)

Paper Code	8	4	6	1
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Sessions;, 2013-2015 &amp; 2014-2016

**Biology** (Objective Type)

**Group-I**

Time: 20 Minutes

Marks: 17

NOTE: Write answers to the questions on the objective answer sheet provided. Four possible answers

A,B,C and D to each question are given. Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

- 1.1. The incidence of stones of calcium phosphate is:
 

(A) 10%	(B) 15%	(C) 20%	(D) 50%
---------	---------	---------	---------
2. Lizards bask in sun to gain:
 

(A) Heat	(B) Cold	(C) Air	(D) Moisture
----------	----------	---------	--------------
3. Cardiac muscles are the muscles of:
 

(A) Heart	(B) Liver	(C) Stomach	(D) Kidney
-----------	-----------	-------------	------------
4. Which is not unguligrade:
 

(A) Deer	(B) Goat	(C) Horse	(D) Bear
----------	----------	-----------	----------
5. 2, 4 D kills broad leaved species:
 

(A) Monocots	(B) Dicots	(C) Mosses	(D) Gymnosperms
--------------	------------	------------	-----------------
6. Luteinizing hormone induces:
 

(A) Ovulation	(B) Flowering	(C) Vernalization	(D) Menopause
---------------	---------------	-------------------	---------------
7. Plant hormone florigen is produced in:
 

(A) Root	(B) Stem	(C) Leaves	(D) Flower
----------	----------	------------	------------
8. In microcephally, the individuals are born with small:
 

(A) Eyes	(B) Legs	(C) Hands	(D) Skull
----------	----------	-----------	-----------
9. The number of chromosomes in sugarcane is:
 

(A) 40	(B) 60	(C) 80	(D) 100
--------	--------	--------	---------
10. The most critical phase of mitosis is:
 

(A) Prophase	(B) Metaphase	(C) Anaphase	(D) Telophase
--------------	---------------	--------------	---------------
11. The cell death due to tissue damage is called:
 

(A) Apoptosis	(B) Necrosis	(C) Meiosis	(D) Mitosis
---------------	--------------	-------------	-------------
12. When a single gene has multiple phenotypic effects, the phenomenon is called:
 

(A) Pleiotropy	(B) Epistasis	(C) Codominance	(D) Sex-linkage
----------------	---------------	-----------------	-----------------
13. Commonly used restriction enzyme is:
 

(A) Eco R <sub>4</sub>	(B) Eco R <sub>3</sub>	(C) Eco R <sub>2</sub>	(D) Eco R <sub>1</sub>
------------------------	------------------------	------------------------	------------------------
14. Archeobacteria tolerate temperature upto
 

(A) 10°C	(B) 40°C	(C) 120°C	(D) 140°C
----------	----------	-----------	-----------
15. Over grazing may lead to the transformation of grassland into a:
 

(A) Tundra	(B) Taiga	(C) Savanna	(D) Desert
------------	-----------	-------------	------------
16. In Sindh, the desert ecosystem is called:
 

(A) Thar	(B) Thal	(C) Sahara	(D) Ghobi
----------	----------	------------	-----------
17. The commercial waste from industry comprises substances is called:
 

(A) Sewage	(B) Effluents	(C) Bilge water	(D) Seepage
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Roll No. \_\_\_\_\_ (to be filled in by the candidate)

**Sessions; 2013-2015 & 2014-2016**  
**Group-I**

**Biology** (Essay Type)

Time: 3:10 Hours

**Section - I**

Marks: 83

2. Write short answers of any eight parts from the following.

2x8=16

- |  |   |
|--|---|
| i. What are excretophores?   | ii. Give role of ADH and aldosterone.                   |
| iii. Briefly describe Pyrexia.   | iv. Define haptonastic movements. Also give an example. |
| v. What are sarcoplasmic reticulums?   | vi. How does tetany differ from tetanus?                |
| vii. What are epiblast and hypoblast?  | viii. How does light affect growth of plants?           |
| ix. Give significance of meiosis.  | x. Briefly describe Turner's syndrome.                  |
| xi. What is meant by inheritance of acquired characteristics? Give an example. |   |
| xii. What are homologous organs? Give an example.                              |   |

3. Write short answers of any eight parts from the following.

2x8=16

- |   |  |
|---|--|
| i. What are biological Rhythms?                                   | ii. Differentiate between Thermoreceptors and Nociceptors. |
| iii. What are effectors? Quote on example.                        | iv. Define cloning.  |
| v. What is vernalization?   | vi. Differentiate between gestation and lactation.         |
| vii.-What are fossil fuels?                                       | viii. State Sanger's method in gene sequencing.            |
| ix. Differentiate between Alpine and boreal forests.              | x. What is productivity in an ecosystem?                   |
| xi. Define biodiversity.  |  |
| xii. What is palindromic sequence related to restriction enzymes? |  |

4. Write short answers of any six parts from the following.

2x6=12

- |   |   |
|---|---|
| i. Write down the structural formula of Adenine.      | ii. Enlist the methods of DNA replication.                |
| iii. What are nucleosomes?                            | iv. Give the importance of test cross.                    |
| v. What is the product rule?                          | vi. For what the abbreviation 'MODY' stands?              |
| vii. Define food chain.                               | viii. What do you understand by the term "trophic level"? |
| ix. Write the significance of root nodules in plants? |   |

**Section - II**

NOTE: Answer any three questions from the following.

8x3=24

- |   |   |
|---|---|
| 5. (a) What is dialysis? Explain its different types.                     | 4   |
| (b) What is ozone layer depletion? What are its effects on life on earth? | 4   |
| 6. (a) Explain comparative Anatomy as an evidence for evolution.          | 4   |
| (b) Write a note on significance of secondary growth in plants.           | 4   |
| 7. (a) Explain Nervous system in Hydra.                                   | (b) Discuss Biotic and Abiotic components of Ecosystem. 4+4=8 |
| 8. (a) What is fertilization? Explain its types.                          | (b) Discuss chemical composition of chromosome. 4+4=8         |
| 9. (a) Write a note on growth correlations.                               | (b) Explain genetics of colour blindness. 4+4=8               |

**Section -III (Practical)**

NOTE: Answer any three parts from the following.

5x3=15

- |  |                            |
|--|----------------------------|
| 10.A Sketch and label the female reproductive system of frog.                            | 5                          |
| B. Sketch and label the hind limb of frog.   | 5                          |
| C. Write down the procedure, observations and result by studying muscle twitch in frog.  | 5                          |
| D. Write the procedure and observations to study water contents of given sample of soil. | 5                          |
| E. Write down short answers of the following:-   | 1x5=5                      |
| (i). Define food chain.  | (ii). What is ligament.    |
| (iii) What is vas deferens.  | (iv). What is kinetochore. |
| (v) What is sternum.   |                            |





Roll No. \_\_\_\_\_ (To be filled in by candidate)

Paper Code	8	4	6	2
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**Sessions; 2013-2015 & 2014-2016**  
**Group-II**

**Biology** (Objective Type)

Time: 20 Minutes

Marks: 17

NOTE: Write answers to the questions on the objective answer sheet provided. Four possible answers

A, B, C and D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with Marker or pen ink on the answer sheet provided.

- In urea cycle the citrulline combines with ammonia to form:
  - arginine
  - ornithine
  - arginase
  - urea
- The animals living in low supply of water, excrete their nitrogenous waste in form of:
  - ammonia
  - urea
  - uric acid
  - albumin
- Sea anemone has:
  - hydroskeleton
  - exoskeleton
  - endoskeleton
  - bone skeleton
- Mature bone cells are called:
  - osteoblasts
  - osteoclasts
  - chondrocytes
  - osteocytes
- A growth retarding hormone is:
  - auxins
  - abscisic acid
  - cytokinin
  - Gibberellins
- The hormone which develops the endometrium receptive for the implantation of zygote is:
  - estrogen
  - progesterone
  - FSH
  - lutinizing hormone
- A structure established between the uterine and foetal tissues for the exchange of materials is:
  - Placenta
  - Follicles
  - ovum
  - menstruation
- From Henson's node dorsal mesoderm is formed and is organized into:
  - Gastrocoele
  - Somites
  - Neural tube
  - Coelom
- Every gene starts with codon AUG which normally encodes the amino acid:
  - Arginine
  - Citrulline
  - Lysine
  - Methionine
- The phase of Mitosis, which ensures equal distribution of chromatids in daughter cells is:
  - Prophase
  - Metaphase
  - Anaphase
  - Telophase
- Microtubules are composed of a protein tubulin and traces of:
  - RNA
  - DNA
  - ATP
  - NAD
- Chance of an event to occur is called as:
  - Crossing over
  - Mutation
  - Epistasis
  - Probability
- Cell suspension cultures of cinchona ledgeriana produces:
  - Digitoxin
  - Insulin
  - antithrombin
  - Quinine
- An essay on the principle of population was published by:
  - Sutton
  - Lyell
  - Malthus
  - Darwin
- Once nitrate enters the plant cell it is reduced to:
  - Nitrite
  - ammonium
  - Ammonia
  - Amino acid
- Northern coniferous forests are also called as:
  - Taiga
  - Tundra
  - Desert
  - Grassland
- All non-cultivated plants and non-domesticated animals are called as:
  - Fossils
  - Fossil fuels
  - Wild life
  - Flora

Roll No. \_\_\_\_\_ (to be filled in by the candidate)

## Biology (Essay Type)

Sessions; 2013-2015 & 2014-2016  
Group-II

Time: 3:10 Hours

### Section - I

Marks: 83

2. Write short answers of any eight parts from the following.

2x8=16

- |  |  |
|--|--|
| i. Sketch urea cycle.                    | ii. Define metanephridium.   |
| iii. What is counter current multiplier? | iv. Differentiate phototropism and geotropism.                         |
| v. What is microcephaly?                 | vi. Differentiate between tetanus and tetany.                          |
| vii. What is primary induction?          | viii. Define epiblast and hypoblast.                                   |
| ix. What happens in diakinesis?          | x. Define non-disjunction.   |
| xi. What are analogous organs?           | xii. Differentiate between natural selection and artificial selection. |

3. Write short answers of any eight parts from the following.

2x8=16

- |  |   |
|--|---|
| i. What is neuroglia. Write their role.                                    | ii. Where pacinian corpuscles are located. Give their function. |
| iii. Define nerve impulse.   | iv. What is climacteric? Give its importance.                   |
| v. What is ozone layer? Give its importance.                               | vi. Differentiate between oviparous and viviparous animals.     |
| vii. Write two goals of human genome project.                              | viii. Write two uses of PCR amplification and analysis.         |
| ix. What are two main sources of water pollution.                          | x. Give two locations of desert ecosystem in Pakistan.          |
| xi. What is profundal zone? Give types of organisms living in it.          |   |
| xii. Define vernalization. Which temperature is effective in this respect? |   |

4. Write short answers of any six parts from the following.

2x6=12

- |   |  |
|---|--|
| i. What is one gene one polypeptide hypothesis.             | ii. What is transformation.                                |
| iii. What are multiple alleles.                             | iv. Differentiate between Heterochromatin and Euchromatin. |
| v. What are polygenic traits? Give an example.              | vi. Differentiate between linkage and crossing over.       |
| vii. What is predation? Give an example.                    | viii. Differentiate between biotic and abiotic components. |
| ix. Differentiate between primary and secondary succession. |  |

### Section - II

NOTE: Answer any three questions from the following.

8x3=24

- |  |   |       |
|--|---|-------|
| 5. (a) Describe the causes of abnormal development.                        |   | 4     |
| (b) Discuss the role of Rh-factor in pregnancy and blood transfusion.      |   | 4     |
| 6. (a) What is sliding filament model? What does it explain?               |   | 4     |
| (b) Describe evidences of evolution with reference to comparative anatomy. |   | 4     |
| 7. (a) Discuss Biological Rhythms.   | (b) Write a note on food chain and food web.              | 4+4=8 |
| 8. (a) Describe human menstrual cycle.                                     | (b) What is transcription? How is it carried out in cell? | 4+4=8 |
| 9. (a) Explain excretion in cockroach.                                     | (b) Briefly discuss man's impact on environment.          | 4+4=8 |

### Section -III (Practical)

NOTE: Answer any three parts from the following.

5x3=15

- |   |                                |
|---|--------------------------------|
| 10.A Sketch and label the female reproductive system of frog.                 | 5                              |
| - B. Sketch and label pelvic girdle of frog.(Dorsal view).                    | 5                              |
| C. Write down the material procedure and observations of muscle twitch.       | 5                              |
| - D. Explain and sketch to show various stages of mitosis in onion root tips. | 5                              |
| E. Write down short answers of the following:-                                | 1x5=5                          |
| (i). Why prophase-I of meiosis is important?                                  | (ii). What is a muscle twitch? |
| (iii) Name biotic components of ecosystem.                                    | (iv). What is cytokinesis.     |
| (v) What are cross bridges?   |                                |





Roll No. \_\_\_\_\_ (To be filled in by candidate)

Paper Code | 4 | 4 | 6 | 5

Sessions; 2015-2017 &amp; 2016-2018

**Biology** (Objective Type)

Time: 20 Minutes

Marks: 17

NOTE: Write answers to the questions on the objective answer sheet provided. Four possible answers

- A, B, C and D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1.1. Archaeobacteria can tolerate temperature:

- (A) 45°C                      (B) 85°C                      (C) 100°C                      (D) 120°C

2. Biome is a large:

- (A) Simple community      (B) Complex community      (C) Regional community      (D) Climax community

3. Desert ecosystem of Mianwali and Bhakkar is called:

- (A) Thal                      (B) Thar                      (C) Cholistan                      (D) Sahara

4. Treasure of all type of resources is:

- (A) Weather                      (B) Climate                      (C) Environment                      (D) Water

5. A dilute solution compared to cell concentration is termed as:

- (A) Hypertonic                      (B) Hypotonic                      (C) Isotonic                      (D) Paratonic

6. Number of NH<sub>3</sub> molecules required to produce one molecule of urea is:

- (A) 1                      (B) 2                      (C) 3                      (D) 4

7. The bone which provides attachment site for muscles is:

- (A) Compact bone                      (B) Spongy bone                      (C) Cartilage                      (D) Hip bone

8. Which one is not a joint disease?

- (A) Arthritis                      (B) Sciatica                      (C) disc slip                      (D) Spondylosis

9. Vehicle for transport of male gamete in land plants is:

- (A) Water                      (B) Pollen tube                      (C) Pollen grain                      (D) Wind

10. Reproduction is necessary for the survival of:

- (A) Individual                      (B) Species                      (C) Population                      (D) Community

11. Apoptosis is:

- (A) Division of cells                      (B) Death of cells by tissue damage  
(C) Suicide of cells                      (D) Weakness of cells

12. Cell cycle involves:

- (A) growth of cell                      (B) replication of DNA  
(C) Cell division                      (D) growth of cell, replication of DNA and cell division

13. Resting membrane potential of a neuron is:

- (A) -50mV                      (B) -60mV                      (C) -70mV                      (D) -80mV

14. Optimum temperature for growth of plants is:

- (A) 30--40°C                      (B) 25--30°C                      (C) 10--20°C                      (D) 5--10°C

15. Particular array of chromosomes that an individual possesses is called:

- (A) Holotype                      (B) Karyotype                      (C) Neotype                      (D) Paratype

16. All the genes found in a breeding population constitute:

- (A) genotype                      (B) Genome                      (C) Gene frequency                      (D) Gene pool

17. Primer for PCR contains about:

- (A) 05 bases                      (B) 10--20 bases                      (C) 30 bases                      (D) 40 bases

Roll No. \_\_\_\_\_ (to be filled in by the candidate)

Sessions; 2015-2017 & 2016-2018

**Biology** (Essay Type)

Time: 2:40 Hours

**Section - I**

Marks: 68

2x8=16

2. Write short answers of any eight parts from the following.

- |  |  |
|--|--|
| i. What is blubber and in which animals is it found?   | ii. Differentiate between osmoregulation and thermoregulation. |
| iii. What is Pyrexia?                                  | iv. How does digitigrade differ from unguligrade?              |
| v. What is ball and socket joint?                      | vi. Define remodeling.   |
| vii. Give two examples of short day plant.             | viii. Write cause and symptoms of syphilis.                    |
| ix. Give types of organisms present in profundal zone. | x. Name different zones of fresh water lakes.                  |
| xi. What is fossil fuel?                               | xii. Define demography.  |

2x8=16

3. Write short answers of any eight parts from the following.

- |  |  |
|--|--|
| i. What is reflex action?  | ii. Differentiate between thermoreceptors and nociceptors. |
| iii. Define succession and give one example  | iv. Differentiate between genotype and phenotype.          |
| v. What is a test cross? Who devised it?   | vi. Differentiate between co-dominance and over-dominance. |
| vii. What are restriction enzymes? Who first isolated them?                          | viii. What are transgenic bacteria?                        |
| ix. What is gene therapy? How cancer cells are killed by gene therapy?               |  |
| x. Differentiate between biosphere and Niche.  |  |
| xi. What are abiotic components of an ecosystem? Give examples.                      |  |
| xii. Differentiate between action membrane potential and resting membrane potential. |  |

2x6=12

4. Write short answers of any six parts from the following.

- |  |   |
|--|---|
| i. Write down the role of temperature as an external factor in plant growth.           |   |
| ii. What role is played by clear cytoplasm and yellow cytoplasm in animal development? |   |
| iii. How many chromosomes are found in sugercane and mouse?                            |   |
| iv. Define translation.  | v. What is the difference between R, and S, type of bacteria?       |
| vi. What are the events of S-Phase?  | vii. Write down the events of metaphase of mitosis.                 |
| viii. How does genetic drift effect the gene frequency?                                | ix. Write the names of four extinct species of animals in Pakistan. |

**Section - II**

NOTE: Answer any three questions from the following.

8x3=24

- |   |   |
|---|---|
| 5. (a) Describe food web in detail. Also draw the diagram.                        | 4 |
| (b) Describe the process of concentration of excretory products in human nephron. | 4 |
| 6. (a) Discuss deformities of skeleton due to genetic and hormonal causes.        | 4 |
| (b) Describe Frederick Griffith's experiment.                                     | 4 |
| 7. (a) What are receptors? Describe its types.                                    | 4 |
| (b) Describe importance of forests.   | 4 |
| 8. (a) Write a note on sexually transmitted disease.                              | 4 |
| (b) Define and discuss Test Cross.  | 4 |
| 9. (a) Describe role of nucleus in development.                                   | 4 |
| (b) Describe non-random mating and selection as factors affecting gene frequency. | 4 |





Roll No. \_\_\_\_\_ (To be filled in by candidate)

Paper Code	8	4	6	5
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Session:2014-2016

## Biology (Objective Type)

Time: 20 Minutes

Marks: 17

NOTE: Write answers to the questions on the objective answer sheet provided. Four possible answers A,B,C and D to each question are given. Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

- 1.1. The total aggregate of genes in a population at any one time is called the population's:  
(A) Gene pool                      (B) Gene flow                      (C) Gene frequency                      (D) Genetic drift
2. Succession is a kind of:  
(A) Community relay                      (B) Population relay                      (C) Ecosystem relay                      (D) Biosphere relay
3. Grassland present in temperate climates are called as:  
(A) Savana                      (B) Prairies                      (C) Forest                      (D) Coniferous
4. Establishment of new forests where no forests existed previously is called:  
(A) Forestation                      (B) Aforestation                      (C) Reforestation                      (D) Deforestation
5. Stomata are on lower surface of leaves and located in depression in a type of plant:  
(A) Mesophytes                      (B) Xerophytes                      (C) Hydrophytes                      (D) Halophytes
6. Minimum water is required for removal of wastes like:  
(A) Urea                      (B) Uric acid                      (C) Creatinine                      (D) Ammonia
7. Mammals walk on the tips of toes modified into hoof are called:  
(A) Digitigrade                      (B) Plantigrade                      (C) Unguligrade                      (D) Brachigrade
8. Slightly elastic connective tissues that attach bone to bone are called:  
(A) Brachialis                      (B) Brachioradialis                      (C) Tendon                      (D) Ligaments
9. Fruit ripening is often accompanied by a burst of respiratory activity called:  
(A) Climacteric                      (B) Parthenocarpic                      (C) Dimetric                      (D) Trimetric
10. Corpus luteum starts secreting a hormone that is called:  
(A) Estrogen                      (B) Progesteron                      (C) Oxytocin                      (D) Insulin
11. Phragmoplast is formed by vesicles which originate from:  
(A) Ribosomes                      (B) Lysosomes                      (C) Golgi complex                      (D) Mesosomes
12. During meiosis crossing over occurs in stage:  
(A) Leptotene                      (B) Zygotene                      (C) Diakinesis                      (D) Pachytene
13. The association of indifferent or situations without patent reward is called:  
(A) Latent learning                      (B) Insight learning                      (C) Imprinting                      (D) Habituation
14. Unspecialized cells present in flatworms and planaria are:  
(A) Neoblast                      (B) Osteoblast                      (C) Osteoclast                      (D) Chondrocyte
15. Okazaki fragments are synthesized by:  
(A) RNA polymerase                      (B) DNA Ligase                      (C) DNA polymerase-III                      (D) Primase
16. Green colour blindness is called:  
(A) Tritanopia                      (B) Protanopia                      (C) Deuteranopia                      (D) Tetranopia
17. Bacterial cells take up recombinant plasmid especially if they are treated with:  
(A) Sodium chloride                      (B) Cesium chloride                      (C) Calcium chloride                      (D) Calcium nitrate

Roll No. \_\_\_\_\_ (to be filled in by the candidate)

Session; 2014-2016

**Biology** (Essay Type)

Marks: 83

2x8=16

Time: 3:10 Hours

**Section - I**

2. Write short answers of any eight parts from the following.

- |  |   |
|--|---|
| i. Differentiate between osmoconformers and osmoregulators.  | ii. What is meant by anhydrobiosis? Quate example.            |
| iii. What is pyrexia?  | iv. Differentiate between sapwood and heartwood.              |
| v. Name types of autonomic movements.                        | vi. What is All or None response?                             |
| vii. Define parthenocarpy? Give one example.                 | viii. Differentiate between oviparous and viviparous animals. |
| ix. Differentiate between phytoplanktons and zooplanktons.   | x. Differentiate between prairies and savana.                 |
| xi. What are renewable resources? Give one example.          |   |
| xii. What are environmental buffers? Write their importance. |   |

2x8=16

3. Write short answers of any eight parts from the following.

- |  |  |
|--|--|
| i. What are reflex action and reflex arc?                            | ii. How Addison's disease and cushing's disease are related? |
| iii. Name the hormones of posterior pitutary and give their effects. | iv. How sexual dimorphism is shown in drosophila?            |
| v. Define epistasis, give one example.                               | vi. What is the pattern of x-linked dominant inheretance?    |
| vii. Name the ways for getting gene of interest for cloning.         | viii. What is cell suspension culture technique?             |
| ix. Give the procedure to clone a transgenic animal.                 | x. Sketch an energy pyramid.                                 |
| xi. Define ecosystem, enlist its main components.                    |  |
| xii. Differentiate between Autecology and Synecology.                |  |

2x6=12

4. Write short answers of any six parts from the following.

- |   |  |
|---|--|
| i. Differentiate between transcription and translation.       | ii. What is one gene one polypeptide Hypothesis? |
| iii. Differentiate between coding and template strand.        | iv. What is differentiation?                     |
| v. Differentiate between growth and development.              | vi. Write the sub stages of meiosis prophase-I.  |
| vii. Define metastasis.                                       | viii. State Endosymbiont Hypothesis.             |
| ix. Write difference between homologous and analogous organs. |  |

**Section - II**

NOTE: Answer any three questions from the following.

- |  |        |
|--|--------|
| 5. (a) Describe the structure and functions of nephron in human kidney.                            | 8x3=24 |
| (b) Draw and discuss nitrogen cycle.   | 4      |
| 6. (a) Describe the process of repair of broken bone.  | 4      |
| (b) Define mutation. Describe point mutation with the help of an example.                          | 4      |
| 7. (a) Write about the forebrain of Man.   | 4      |
| (b) Explain green house effect. Its causes and effect on environment.                              | 4      |
| 8. (a) How complete dominance differs from incomplete dominance? Explain with examples.            | 4      |
| (b) Explain the human female reproductive system.  | 4      |
| 9. (a) What is embryonic induction? Explain with the help of spemann primary organizer experiment. | 4      |
| (b) Describe any four factors effecting gene frequency( Evolutionary change).                      | 4      |

**Section -III (Practical)**

NOTE: Answer any three parts from the following.

- |   |                             |
|---|-----------------------------|
| 10.A Sketch labelled diagram of male urinogenital system of frog.                               | 5x3=15                      |
| B. Sketch and label diagram of hind-limb of frog.   | 5                           |
| C. Write down material, procedure, observation and results to demonstrate simple muscle twitch. | 5                           |
| D. Draw and explain food web in aquatic ecosystem.  | 5                           |
| E. Write down short answers of the following:-  | 1x5=5                       |
| (i). Define mitosis.  | (ii). Define smooth muscles |
| (iii) Define food chain.  | (iv). What is geotropism?   |
| (v) What is ganglion.   |                             |





Roll No. \_\_\_\_\_ (To be filled in by candidate)

(For all sessions)

Paper Code	8	4	6	5
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**Biology** (Objective Type)

Time: 20 Minutes

Marks: 17

NOTE: Write answers to the questions on the objective answer sheet provided. Four possible answers A, B, C and D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with Marker or pen ink on the answer sheet provided.

- 1.1. The floral parts of a flowering plant are:  
(A) Homologous (B) Analogous (C) Similar (D) Different
2. Mutualism is a type of:  
(A) Symbiosis (B) Commensalism (C) Parasitism (D) Predation
3. The average rainfall in temperate deciduous forest is between:  
(A) 700-2500 m.m (B) 700-800 m.m (C) 700-1000 m.m (D) 700-1500 m.m
4. The two main causes of air pollution are industrialization and:  
(A) Automobiles (B) Urbanization (C) Deforestation (D) Overgrazing
5. The leaves with very small surface area, are found in:  
(A) Hydrophytes (B) Mesophytes (C) Xerophytes (D) Sciophytes
6. The compound which take part in urea cycle is:  
(A) Adenine (B) Guanine (C) Citrulline (D) Thymine
7. Osteomalacia includes a number of disorders in which bones receive inadequate:  
(A) Water (B) Oxygen (C) Blood (D) Minerals
8. Each A-band has a lighter stripe in its mid section called:  
(A) A-Zone (B) H-Zone (C) M-Line (D) Z-Line
9. The receptor cells of planaria are sensitive to:  
(A) Light and pressure (B) Light, pressure and touch  
(C) Touch pressure and chemicals (D) Light, pressure, touch and chemicals
10. In nature P<sub>730</sub> to P<sub>660</sub> Conversion occurs in:  
(A) Dark (B) Light (C) Morning (D) Evening
11. Lutenizing hormone in human female induces:  
(A) Menstruation (B) Menopause (C) Oogenesis (D) Ovulation
12. The branch of biology which deals with the study of abnormal development is:  
(A) Morphology (B) Embryology (C) Teratology (D) Peratology
13. The genetic code for glycine is:  
(A) UAG (B) GAU (C) GUA (D) GGU
14. In turner syndrome the affected person have set of chromosomes:  
(A) XO (B) XXY (C) XYY (D) XXO
15. The leptotene and zygotene lasts for:  
(A) few hours (B) few days (C) few weeks (D) few years
16. The maturity on set diabetes of the young is:  
(A) An autosomal recessive trait (B) An autosomal dominant trait  
(C) A sex linked trait (D) A sex influenced trait
17. The organisms used as biofilters is:  
(A) Transgenic plant (B) Transgenic animal (C) Transgenic bacteria (D) Transgenic virus

Roll No. \_\_\_\_\_ (to be filled in by the candidate)

(For all sessions)

**Biology** (Essay Type)

Time: 2:40 Hours

**Section - I**

Marks: 68

**2. Write short answers of any eight parts from the following.**

2x8=16

- i. Differentiate between pyrexia and pyrogens.
- ii. What are behavioural adaptations to regulate heat exchange between animals and environment?
- iii. What are excretophores? Give an example.
- iv. Define turgor pressure. Give its two functions.
- v. What are collenchyma cells? Discuss.
- vi. Define nastic movement. What is Thermonasty?
- vii. Differentiate between Menstrual cycle and Oestrous cycle.
- viii. What are test tube babies? Discuss.
- ix. Differentiate between climate and weather.
- x. Discuss productivity of aquatic ecosystem.
- xi. Differentiate between herbicides and fungicides.
- xii. What is the Ozone layer depletion?

**3. Write short answers of any eight parts from the following.**

2x8=16

- i. Write commercial application of cytokinins.
- ii. What are the functions of oxytocin hormones?
- iii. Give the role of insulin and glucagon.
- iv. Define linkage and give its one disadvantage.
- v. What do you know about gene and locus?
- vi. Define Law of segregation.
- vii. Write down the treatment of cancer through gene therapy.
- viii. What are bioreactors?
- ix. Write two uses of PCR.
- x. What are root nodules? Give their importance.
- xi. Compare population and community and give their example.
- xii. Define ammonification and assimilation.

**4. Write short answers of any six parts from the following.**

2x6=12

- i. How aging can be slowed down?
- ii. What are metabolic defects? Give one example.
- iii. Give the role of mRNA and tRNA in translation.
- iv. How do histone and DNA interact with each other in nucleosome.
- v. Give two limitations of DNA polymerase III in DNA replication.
- vi. How does cell death help in development of multicellular organism.
- vii. What happens during diplotene stage.
- viii. Define genetic drift and give its effect.
- ix. Write down the measures for the preservation of endangered species.

**Section - II****NOTE: Answer any three questions from the following.**

8x3=24

5. (a) Describe the structure and function of Nephron. 4
- (b) Compare food chain with food web. 4
6. (a) Discuss the mechanism of repair of broken bones. 4
- (b) How did Meselson and Stahl show that DNA replication is semiconservative. 4
7. (a) Describe any four functions of Gibberellins. 4
- (b) Define pollution. Write a note on Air or Atmospheric pollution. 4
8. (a) Compare sexual reproduction with asexual reproduction. 4
- (b) Describe the process of sex determination in plants and yeast. 4
9. (a) Write a note on the development of chick upto gastrulation stage. 4
- (b) Discuss natural selection and artificial selection. 4



Roll No. _____ (To be filled in by candidate)
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(For all sessions)

Paper Code	8	4	6	7
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## Biology (Objective Type)

**Time: 20 Minutes****Marks: 17**

NOTE: Write answers to the questions on the objective answer sheet provided. Four possible answers A,B,C and D to circle A,B,C or D given in front of each each question are given. Which answer you consider correct, fill the corresponding question with Marker or pen ink on the answer sheet provided.

- 1.1. The vernolic acid and ricinolic acid can be used as hardness in:
 

(A) paints	(B) plastics	(C) Paints and plastics	(D) Rubber
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2. Darwin's "Origin of species" was published in:
 

(A) 1840	(B) 1859	(C) 1865	(D) 1890
----------	----------	----------	----------
3. Study of relationship of different communities to environment is called:
 

(A) Synecology	(B) Autecology	(C) Embryology	(D) Zoology
----------------	----------------	----------------	-------------
4. Which one is not a desert?
 

(A) Thal	(B) Thar	(C) Sahara	(D) Taiga
----------	----------	------------	-----------
5. The steady internal state of homeostasis is known as:
 

(A) Disorder	(B) Disease	(C) Normal health	(D) Abnormal health
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6. Pressure filtration is associated with the:
 

(A) Glomerular Part	(B) Collecting tubule
(C) Distal convulated tabule	(D) Collecting duct
7. The diameter of thick filament in muscle is:
 

(A) 7-8 nm	(B) 4 nm	(C) 16 nm	(D) 10 nm
------------	----------	-----------	-----------
8. At the place of attachment of leaf with the shoot a swollen part is called:
 

(A) Pitch	(B) Pit	(C) Cortex	(D) Pulvinus
-----------	---------	------------	--------------
9. Intelligence is under the control of:
 

(A) Cerebrum	(B) Cerebellum	(C) Thalamus	(D) Hypothalamus
--------------	----------------	--------------	------------------
10. Diploid parthenogenesis may occur in:
 

(A) Bees	(B) Aphid	(C) Wasp	(D) Honey Bee
----------	-----------	----------	---------------
11. The hypoblast is mainly presumptive:
 

(A) Endoderm	(B) Epiderm	(C) Mesoder	(D) Blastoderm
--------------	-------------	-------------	----------------
12. It is one of the prominent structure in the chick embryo of 18 hours:
 

(A) Primitive streak	(B) Neurocoel
(C) Notochord	(D) Coelom
13. Initiation codes for every protein coding gene is AUG which encodes for:
 

(A) Leucine	(B) Serine	(C) Alanine	(D) Methionine
-------------	------------	-------------	----------------
14. The term Bivalent means:
 

(A) One chromosome	(B) Two chromosomes	(C) Two chromatids	(D) Four Chromosomes
--------------------	---------------------	--------------------	----------------------
15. Mongolism is phenotypically:
 

(A) Male	(B) Female	(C) Male or Female	(D) None
----------	------------	--------------------	----------
16. How many possible alleles of ABO blood group are present in an individual?
 

(A) 1	(B) 2	(C) 3	(D) 300
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17. Dopamine producing cells can be grafted in the brain in order to cure:
 

(A) Haemophilia	(B) Epilepsy	(C) Parkinson's disease	(D) Alzheimer's
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Roll No. _____ (to be filled in by the candidate)
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## Biology (Essay Type)

Time: 2:40 Hours

## Section - I

Marks: 68

2. Write short answers of any eight parts from the following.

2x8=16

- |  |  |
|--|--|
| i. Why do marine fishes retain trimethylamine oxide in their body? | ii. Give the significance of tubular secretion in filterate. |
| iii. How do aldosterone and ADH help in concentration of urine?    | iv. Differentiate between heart wood and sap wood:           |
| v. What is Nutation?   | vi. Name the bones of pectoral girdle.                       |
| vii. Give the role of foetus during the timing of delivery.        | viii. What is the cause and symptoms of Syphilis?            |
| ix. Differentiate between climate and weather:                     | x. What is Taiga? Give conditions in Taiga.                  |
| xi. Define soil. Give its composition.                             | xii. What are the effects of global warming?                 |

3. Write short answers of any eight parts from the following.

2x8=16

- |  |   |
|--|---|
| i. Discuss the effect of age and emotions on epilepsy. | ii. Why the Hypothalamus is a main Coordination center? |
| iii. What type of behaviour is Kinesis?                | iv. What is Product Rule?                               |
| v. Discuss Dominance relation. Give one example.       | vi. What is Rh-factor?                                  |
| vii. What is Gene Pharming?                            | viii. What is cystic fibrosis?                          |
| ix. Discuss importance of Tissue-culture.              |   |
| x. What are decomposers?                               |   |
| xi. What is Food Chain?                                |   |
| xii. What type of trophic level exists in Food Chain?  |   |

4. Write short answers of any six parts from the following.

2x6=12

- |   |   |
|---|---|
| i. How increase in length of plant body occurs? Discuss it.                         |   |
| ii. Can aging be slowed down in human? Comment on it.                               |   |
| iii. Differentiate between Template and coding strands of DNA during transcription. |   |
| iv. Give role of promoter in transcription.   | v. Why DNA replication cannot complete without DNA Helicase?                      |
| vi. Distinguish Convergent Evolution from Divergent Evolution.                      | vii. Differentiate between Endangered species and Extinct species. Give examples. |
| viii. Differentiate between Karyokinesis and cytokinesis.                           | ix. What is crossing over? Give its significance.                                 |

## Section - II

NOTE: Answer any three questions from the following.

8x3=24

- |   |   |
|---|---|
| 5. (a) How osmoregulation takes place in terrestrial environment?   | 4 |
| (b) Write a note on synecology and autecology.  | 4 |
| 6. (a) Demonstrate the antagonistic working of hinge joint of elbow.  | 4 |
| (b) Describe the process of transcription emphasizing initiation, elongation and termination steps. (Post transcriptional modifications are not required) | 4 |
| 7. (a) Describe the mechanism of synaptic transmission.   | 4 |
| (b) How acid rain is produced? What are the causes and effects of acid rain?  | 4 |
| 8. (a) Describe human menstrual cycle's primary steps.  | 4 |
| (b) Write a note on Sex determination in plants   | 4 |
| 9. (a) Define regeneration with two examples. Discuss the mechanism of regeneration in planaria and salamander.   | 4 |
| (b) Do the anatomical similarities between species bring any evidence in the support of evolution? If yes, explain.                                       | 4 |