

Roll No. ....

Total No. of Questions : 9]  
(2041)

[Total No. of Printed Pages : 4

**UG (CBCS) IIIrd Year (Annual) Examination**

**2549**

**B.Sc. ZOOLOGY**

(Sericulture)

(SEC-III)

**Paper : ZOOL 303 TH**

**Time : 3 Hours]**

**[Maximum Marks : 70**

*Note :-* Attempt *five* questions in all, selecting at least *one* question from each of the Section B, C, D and E. Question No. 1 of Section A is compulsory.

**Section-A**

**(Compulsory Question)**

1. (a) Do as directed :

(i) Scientific name of Muga silkworm is

.....

(ii) Silk is a secretion of silkworm from specialized ..... glands.

(iii) Full form of RKO is .....

**CH-374**

( 1 )

Turn Over

- (iv) ..... disease of mulberry plants is caused by a nematode.
- (v) Young age silkworms upto second instar are called .....
- (vi) Assam is famous for which type of silk ?  
(a) Muga silk      (b) Butterfly silk  
(c) Tasar silk      (d) None of these
- (vii) Which one of the following mountages is most commonly used in South India and West Bengal ?  
(a) Bottle brush mountage  
(b) Chandrika mountage  
(c) Plastic mountage  
(d) Rotary mountage
- (viii) Most common and worst disease of silkworm is :  
(a) Grasserie      (b) Flacherie  
(c) Muscardine      (d) Pebrine
- (ix) Muga silkworm is :  
(a) Univoltine      (b) Bivoltine  
(c) Polyvoltine      (d) Multivoltine

- (x) "Silk Mark Scheme" was started in :
- (a) 1994                      (b) 1998  
(c) 2004                      (d) 2008                      1×10=10
- (b) Differentiate the following (at least *two* differences) :
- (i) Bombyx mori and Antheraea paphia  
(ii) Antheraea assamensis and Puposomia ricini  
(iii) Histogenesis and histolysis  
(iv) Plastic mountage and Bamboo strip mountage                      2×4=8

### Section-B

2. Explain in detail the origin and history of sericulture. 13
3. What is Silk ? Explain in detail the various types of silkworms and the types of silk they produce. 13

### Section-C

4. (a) Discuss the taxonomic position of silkworm.  
(b) Enumerate the life cycle of Bombyx mori with the help of neat and labelled diagrams. 3,10
5. (a) Explain in detail the different types of mountages.  
(b) What are the infectants recommended for sericulture. 8,5

### Section-D

6. Name the various diseases of silkworms. Explain the causative agent, epidemiology, symptoms, prevention and control of any *two* of them. 13
7. (a) Explain in detail about Cocoon harvesting.  
(b) Explain in detail about Cocoon drying and storage of Cocoons. 6½, 6½

### Section-E

8. (a) Compare the causative agent and symptoms of powdery mildew and root knot diseases of mulberry plants.  
(b) Describe the establishment and functions of CSRTI and NSSO. 5,8
9. (a) Write the full form of the following :  
(i) SMOI  
(ii) CSGRC  
(iii) SBRL 1×3=3
- (b) What are the prospects of sericulture in India ? Also highlight the challenges for the future of Indian Sericulture Industry. 10

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**UG (CBCS) Ist Year Annual Examination**

**3012**

**B.Sc. ZOOLOGY**

**(Comparative Anatomy and Developmental  
Biology of Vertebrates)**

(Core)

Paper : ZOOL-102 TH

**Time : 3 Hours]**

**[Maximum Marks : 50**

*Note* :- Attempt *five* questions in all, selecting *one* question from each Section. Section A is compulsory.

**Section-A**

**(Compulsory Question)**

1. Do as required :

(i) Integumentary system includes :

(a) Skin

(b) Hair

(c) Nails and Hooves (d) All of these

(ii) Mucous glands predominate in frogs while  
..... glands predominate in toads.

**CA-212**

( 1 )

Turn Over

(iii) Male lizards have tubular ..... glands  
undersurface of thighs.

(iv) What is Diastema ?

(v) Scroll valve occurs in shark intestine.

(True/False)

(vi) Milk dentition in mammals lacks :

(a) Premolars

(b) Molars

(c) Canines

(d) Incisors

(vii) Sound producing chamber in birds is called  
.....

(viii) A pacemaker of heart is :

(a) SA Node

(b) A-V node

(c) Purkinje fibres

(d) Bundle of HIS

(ix) Cerebrum is not divided into hemispheres in the  
brain of .....

(x) What is Spermiogenesis ?

1×10=10

### Section-B

2. (a) Draw a well labelled diagram of V.S. Skin  
(Mammals).

(b) Describe different types of skin glands of  
vertebrates according to their structure.

(c) Discuss in brief about the pseudobranch. 4+4+2=10

3. (a) Draw a well labelled diagram showing respiratory system of a bird.
- (b) Draw a well labelled diagram of a ruminant stomach. Explain the role of each part.  $5+5=10$

### Section-C

4. (a) Draw well labelled diagrams of brains of fish and amphibians. Tabulate the major differences between them.
- (b) The wall of ventricles of heart is much thicker than the atrial wall. Comment.  $8+2=10$
5. (a) Draw a well labelled diagram of amphibian heart. Discuss how is it advanced over fish heart.
- (b) Draw a well labelled diagram of V.S. Eye (human).  $6+4=10$

### Section-D

6. (a) What are morphogenetic movements ? Describe different types of morphogenetic movements that occur during gastrulation.
- (b) What is a fate map ? Draw a fate map for any animal you have studied.  $6+4=10$

7. (a) Draw a well labelled diagram of mammalian sperm. Also describe the details of acrosomal reaction.
- (b) Write brief notes on the following :
- (i) Superficial cleavage
  - (ii) Block to polyspermy 6+4=10

### Section-E

8. (a) What is Placenta ? Discuss the mechanism of implantation in humans.
- (b) What is Vitellogenesis ? Discuss the process of vitellogenesis elaborately. 5+5=10
9. (a) What is Metamorphosis ? Explain this process with reference to frog along with hormonal regulation.
- (b) Write notes on any *two* of the following :
- (i) Deciduate Placenta
  - (ii) Diffused Placenta
  - (iii) Syndesmochorial Placenta
  - (iv) Haemoendothelial Placenta 6+4=10



Total No. of Questions : 9]  
(2033)

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## UG (CBCS) Ist Year Annual Examination

# 3011

### B.Sc. ZOOLOGY

#### (Animal Diversity)

(Core)

Paper : ZOOL-101 TH

Time : 3 Hours]

[Maximum Marks : 50

*Note* :- Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is compulsory.

### Section-A

#### (Compulsory Question)

1. Do as directed :

(i) The main function of contractile vacuole is :

- (a) Excretion                      (b) Respiration  
(c) Osmoregulation              (d) None of these

(ii) Gemmules play a role in :

- (a) Perennation                      (b) Dispersal  
(c) Reproduction                      (d) All of these

- (iii) Give an example of class Hydrozoa.
- (iv) Bladder worm is a larval form present in the life cycle of :
- (a) Taenia (b) Fasciola  
(c) Ascaris (d) Schistosoma
- (v) The juvenile of *Ascaris lumbricoides* undergoes moulting ..... times.
- (vi) Division of body into anteroposterior row of similar parts is called .....
- (vii) ..... is the rasping organ in the buccal cavity of mollusca.
- (viii) Tail of cartilaginous fishes is :
- (a) Homocercal (b) Heterocercal  
(c) Diphyccercal (d) Protocercal
- (ix) Which of the following represents sub-class Apoda ?
- (a) Ichthyophis (b) Necturus  
(c) Rhacophorus (d) Phrynosoma
- (x) Birds are :
- (a) Ureotelic (b) Uricotelic  
(c) Ammonotelic (d) Aminotelic

**Section-B**

5 each

2. (a) What is a Pseudopodia ? Briefly discuss its types giving suitable examples.
- (b) Write the general characters of Phylum Porifera.
3. (a) Briefly explain the life cycle of *Taenia solium*.
- (b) List the parasitic adaptations of *Ascaris lumbricoides*.

**Section-C**

5 each

4. (a) Differentiate pseudometamerism and metamerism giving suitable examples.
- (b) Explain the structure and function of an ommatidium in insects.
5. (a) Write a brief note on torsion in Mollusca.
- (b) List the general characters of Phylum Echinodermata.

**Section-D**

5 each

6. (a) Write a brief note on Ammocoete larva of petromyzon.
- (b) Briefly discuss the theory of Echinodermal origin of Chordates.

7. (a) Give an outline of classification of class Amphibia upto orders with examples.

(b) How osmoregulation differs in fresh and marine water fishes ?

**Section-E**

5 each

8. (a) How can different poisonous snakes be identified ?

(b) Give the scientific names and classification of the following birds :

(i) Peacock

(ii) Duck

9. (a) Explain the following giving examples :

(i) Marsupium

(ii) Patagium

(b) Tabulate the differences between Ratitae and Carinatae.

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Total No. of Questions : 9]  
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**UG (CBCS) IInd Year Annual Examination**

**3115**

**B.Sc. ZOOLOGY**

(Physiology and Biochemistry)

(DSC-IC)

Paper : ZOOL 201 TH

**Time : 3 Hours]**

**[Maximum Marks : 50**

*Note :-* Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is compulsory.

**Section-A**

**(Compulsory Question)**

1. Multiple Choice Questions :

(i) Gall Bladder releases bile juice after stimulation from :

(a) Anterocrinin

(b) Vilikinin

(c) Renin

(d) Mucous

**CA-315**

( 1 )

Turn Over

- (ii) Structures present in neuron and involved in protein synthesis are :
- (a) Neurofibrils
  - (b) Gated channels
  - (c) Nissl's granules
  - (d) Permeases
- (iii) The volume of air taken in and given out at each normal inspiration and capiration is known as :
- (a) Vital capacity
  - (b) Residual volume
  - (c) Tidal capacity
  - (d) Tidal volume
- (iv) The functional unit of the contractile system in a striated muscle is :
- (a) Sarcomere
  - (b) Aband
  - (c) Zline
  - (d) Myofibril
- (v) Growth hormone is secreted by :
- (a) Thyroid
  - (b) Thymas
  - (c) Adrenal
  - (d) Pituitary
- (vi) Luteal phase is the other name of :
- (a) Follicular phase
  - (b) Proliferative
  - (c) Menstrual flow phase
  - (d) Secretory phase

- (vii) Enzymes with two active sites are known as :
- (a) Apoenzyme (b) Holoenzyme  
(c) Allosteric enzyme (d) Proenzyme
- (viii) The Primer Molecule in the process of Biosynthesis of Palmitic acid is :
- (a) Acetic acid (b) Pyruvic acid  
(c) Oxaloacetic acid (d) Acetyl Co-A
- (ix) Removal of amino group from an aminated compound like amino acids is called :
- (a) Deamination  
(b) Transamination  
(c) Both (a) and (b)  
(d) None of these
- (x) A nerve impulse leaves a neuron through the :
- (a) Dendrite (b) Cyton  
(c) Axon (d) Niss's bodies
- $1 \times 10 = 10$

### Section-B

2. (a) Explain how a nerve impulse is propagated along a nerve fibre ?
- (b) Describe the physical and chemical changes in the muscle during its contraction. 5+5
- Or*
3. (a) What are different secretory products in different parts of alimentary canal ? Discuss the nervous and hormonal regulations of these secretions.
- (b) Discuss the different factors which influence oxygen transport by haemoglobin. 5+5

### Section-C

4. (a) Explain the countercurrent multiplier theory. How is concentrated urine excreted by the kidney?

(b) What is Cardiac Cycle? Describe different stages of cardiac cycle. 5+5

*Or*

5. (a) What is Menstrual Cycle? Explain the various changes that occur during the cycle.

(b) Why Pituitary gland is known as master gland? Explain the hormone secreted by pituitary gland. 5+5

### Section-D

6. (a) Explain Krebs Cycle in detail.

(b) Explain in detail the process of Gluconeogenesis. 5+5

*Or*

7. (a) Discuss in detail Pentose Phosphate Pathway.

(b) Explain  $\beta$ -oxidation of palmitic acid. 5+5

### Section-E

8. (a) Explain Urea Cycle with the enzymes involved in it.

(b) Discuss induced fit theory of Enzyme Action. 5+5

*Or*

9. (a) Write down the various properties of enzymes.

(b) Explain Oxidative deamination and Transamination. 5+5



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**UGC (CBCS) IInd Semester (New)  
Examination**

**471**

**B.Sc. ZOOLOGY**

**(Comparative Anatomy and Developmental Biology  
of Vertebrates)**

**(Core)**

**Paper : ZOOL-201**

**Time : 3 Hours]**

**[Maximum Marks : 50**

**Note :-** Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is compulsory.

**Section-A**

**(Compulsory Question)**

1. (A) Do as required :

- (i) Holocrine glands are also called as  
..... glands.

**CH-371**

( 1 )

Turn Over

(ii) Dermal scales are absent in :

(a) Amphibians

(b) Reptiles

(c) Aves

(d) Mammals

(iii) Frog's teeth are :

(a) Pleurodont

(b) Acrodont

(c) Thecodont

(d) Monophyodont

(iv) Schneiderian membrane is also known as

.....

(v) Largest number of Aortic arches are found

in .....

(vi) The optic lobes are solid in :

(a) Birds

(b) Mammals

(c) Both (a) and (b)

(d) None of these

(vii) Receptor of pain are :

(a) Pacinian corpuscles

(b) Merkel's discs

(c) Free nerve endings

(d) Meissner's corpuscles

(viii) Pupil is regulated by ..... muscles.

(ix) Transformation of spermatid into a spermatozoon is called .....

(x) Placenta in humans is :

(a) Discoidal

(b) Metadiscoidal

(c) Diffuse

(d) Cotyledonary

1×10=10

(B) Write short notes on the following :

(i) Holoblastic cleavage

(ii) Sperm of frog

(iii) Structure of nail

(iv) Functions of cerebral hemisphere

4×2=8

### Section-B

2. (a) Name the types of feathers and explain the structure of quill in detail.

(b) Give the structure of simple horn.

6+2=8

3. (a) Give the detailed account of visceral arches in *Scoliodon*.

(b) Write a short note on the Tooth of Frog.

6+2=8

### Section-C

4. (a) Describe the heart of Frog. How does it differ from reptilian heart.
- (b) Draw the buccopharyngeal cavity of birds. 6+2=8
5. (a) Describe the respiratory system in birds.
- (b) Give different Aortic Arches in Amphibia. 6+2=8

### Section-D

6. (a) Give the evolution of kidneys in mammals.
- (b) Draw the structure of taste buds. 7+1=8
7. (a) Describe the brain of any mammal. How is it advanced over birds ?
- (b) Describe the ampulla of Lorenzini briefly. 6+2=8

### Section-E

8. (a) What is Gametogenesis ? Describe the process of spermatogenesis in detail.
- (b) Define :
- (i) Fertilization
- (ii) Fate maps 6+2=8
9. (a) What is Metamorphosis ? Describe in Frog.
- (b) Write a short note on Human Placenta. 6+2=8

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Total No. of Questions : 9]  
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**UG (CBCS) IIIrd Year (Annual) Examination**

**3248**

**B.Sc. ZOOLOGY**

(Reproductive Biology)

(DSE-IB)

Paper : ZOOL 302 (C) TH

**Time : 3 Hours]**

**[Maximum Marks : 50**

**Note :-** Attempt *five* questions in all, selecting *one* question from each of the Sections B, C, D and E. Question No. 1 of Section A is compulsory. Attempt all parts of a question together. Support your answers with suitable diagrams.

**Section-A**

**(Compulsory Question)**

1. Do as required :

(i) Implantation involves attachment of :

(a) Fertilized egg to endometrium

(b) Blastocyst to endometrium

**CH-48**

( 1 )

Turn Over

- (c) Blastocyst to perimetrium  
 (d) Gastrula to endometrium
- (ii) In all the mammals, the testes are Extra-abdominal and lie in Scrotal Sacs. (True/False)
- (iii) Polocytes are formed during :
- (a) Spermatogenesis  
 (b) Oogenesis  
 (c) Ovulation  
 (d) None of these
- (iv) Maternal tissue shed after birth is called .....
- (v) Name few oral contraceptive pills for birth control.
- (vi) Proliferated epithelial lining of uterus is called .....
- (vii) What are Ovotestes ?
- (viii) Fertilization of sperm and ovum takes place in isthmus of Fallopian tube. (True/False)
- (ix) Obtaining of sperms from testes by fine needle aspiration technique is called as :
- (a) TESA (b) PESA  
 (c) IVF (d) POST

(x) Manchette is formed in the :

(a) Ovum

(b) Polar bodies

(c) Spermatid

(d) Ootid  $1 \times 10 = 10$

### Section-B

2. (a) Describe development and differentiation of gonads in mammals.

(b) Give an account of female gonadal hormones.  $5 \times 2 = 10$

3. (a) Explain in detail hypothalamic-hypophysial gonadal axis.

(b) Discuss the mechanism of sex differentiation.  $5 \times 2 = 10$

### Section-C

4. (a) Explain the process of spermatogenesis along with its hormonal regulation.

(b) Give an account of male accessory glands associated with the reproductive system.  $5 \times 2 = 10$

5. (a) Explain androgen synthesis in males.

(b) With the help of diagram, explain the structure of mature human sperm and give a brief account of the hormone responsible for their production.

$5 \times 2 = 10$

### Section-D

6. (a) Explain in detail the formation of corpus luteum and its regression.
- (b) Give a brief account of reproductive cycle and their regulation in human.  $5 \times 2 = 10$
7. (a) Define Implantation. Explain the hormonal control of implantation.
- (b) Explain the mechanism of Fertilization.  $5 \times 2 = 10$

### Section-E

8. (a) What are the causes of infertility in males and females ?
- (b) Describe in detail the procedure of *In-vitro* fertilization.  $5 \times 2 = 10$
9. (a) What are assisted reproductive technologies ? Explain Endometrial function test in detail.
- (b) Explain GIFT and give its limitations.  $5 \times 2 = 10$



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**UG (CBCS) IInd Year Annual Examination**

**3116**

**B.Sc. ZOOLOGY**

**(Genetics and Evolutionary Biology)**

**(DSC-ID)**

**Paper : ZOOL 202 TH**

**Time : 3 Hours]**

**[Maximum Marks : 50**

**Note :-** Attempt *five* questions in all. Attempt *one* question each from Sections–B, C, D and E. Question No. 1 (Section–A) is compulsory.

**Section–A**

**(Compulsory Question)**

1. (i) Mendel's conclusions were published in year

.....

(ii) Position of gene on a chromosome is called

.....

**CA–316**

( 1 )

Turn Over

- (iii) If a single gene affects more than one phenotypic expression. This phenomenon is called .....
- (iv) Define Multiple Allelism.
- (v) What is extra-chromosomal inheritance ?
- (vi) How many linkage groups are present in maize ?
- (vii) Unit of distance between linked gene is .....
- (viii) Mutational unit of DNA is .....
- (ix) ..... extinction is caused by unplanned human activities.
- (x) ..... era is called age of mammals and angiosperms. 1×10=10

### Section-B

2. (a) Describe Mendel's Laws of genetics giving examples.
- (b) In humans, blue eye colour is recessive to brown eye colour, brown eyed male and a blue eyed mother :

- (i) What is the genotype of man and his mother ?
- (ii) What are possible genotypes of his father ? 7+3
3. (a) Describe the chromosomal theory of inheritance giving examples.
- (b) What is multiple allelism ? Explain it with examples. How it differs from lethal alleles ? 5+5

### Section-C

4. (a) What are chromosomal mutations ? Explain in detail.
- (b) Describe XX (g) - XX type ( $\sigma$ ) sex determination. 8+2
5. (a) How will you differentiate linkage and crossing over ?
- (b) Briefly describe phenomenon of crossing over. 5+5

### Section-D

6. (a) Describe major events in History of life giving theories of origin of life. 5+5
- (b) What is Neo-Darwinism ? Explain. 5+5
7. (a) Explain Phylogeny of Horse.
- (b) Describe Natural selection giving example of Industrial Melanism. 5+5

### Section-E

8. (a) Write short notes on any *one* of the following :
- (i) Allopatric species and sympatric species
- (ii) Role of extinction in evolution
- (b) Explain Darwin's Finches. 5+5
9. (a) What are the major advantages of Biological species concept ? Give disadvantages also.
- (b) Describe Mass Extinction Concept in detail. 5+5

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**UGC (CBCS) IIIrd Semester (New)  
Examination**

**1454**

**ZOOLOGY**

**(Physiology and Biochemistry)**

(Core)

**ZOOL 301**

**Time : 3 Hours]**

**[Maximum Marks : 50**

**Note :-** Question No. 1 of Section-A is compulsory. Attempt *five* questions in all, selecting *one* question from each of the Sections-B, C, D and E. Attempt all parts of a question together. Make well labelled diagrams to supplement your answer wherever necessary.

**Section-A**

**(Compulsory Question)**

1. (A) Answer in a single word or single line or fill in the blanks or choose the correct option or write True or False. Do as required :

**C-54**

( 1 )

Turn Over

(i) Enzymes with two active sites are known

as :

- (a) Holoenzyme
- (b) Proenzyme
- (c) Allosteric enzyme
- (d) Apoenzyme
- (e) None of these

(ii) Sliding filament theory of muscle contraction was proposed by :

- (a) H. E. Huxley
- (b) A. F. Huxley
- (c) R. E. Davies
- (d) Both (a) and (b)
- (e) None of these

(iii) Active sites of actin protein are covered

by :

- (a) Tropomyosin
- (b) Troponin
- (c) Heads of Myosin
- (d) G actin molecules
- (e) None of these

(iv) Intestinal juice is also called .....

(v) Glycolysis occurs in :

- (a) Ribosomes
- (b) Mitochondrial Matrix
- (c) Intermembrance Space
- (d) Cytoplasm





**B)** Write brief notes on the following :

- (i) SA Node
- (ii) Menopause
- (iii) Vital capacity of lungs
- (iv) Role of calcium in muscle contraction  $2 \times 4 = 8$

### Section-B

- 2. (a) What is a Synapse ? Explain the transmission of nerve impulse across a synapse.
- (b) Draw a well labelled diagram of a sarcomere.  $5+3=8$
- 3. (a) Explain the physiology of digestion of proteins in alimentary canal of man.
- (b) What is Bohr's effect ?  $5+3=8$

### Section-C

- 4. (a) Explain the counter-current mechanism of urine formation in detail. Also give its significance.
- (b) Explain the internal structure of Human Heart.  $4+4=8$

Roll No. ....

Total No. of Questions : 9]  
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**UG (CBCS) IIIrd Year (Suppl.) Examination**  
**2258**

**B.Sc. ZOOLOGY**  
**(Reproductive Biology)**  
**(DSE-IB)**  
**Paper : ZOOL 302(C) TH**

**Time : 3 Hours]**

**[Maximum Marks : 50**

*Note* :- Attempt *five* questions in all, selecting *one* question from each Sections B, C, D and E. Q. No. 1 of Section-A is compulsory. Attempt all parts of a question together. Draw a labelled diagram wherever necessary.

**Section-A**

1. Do as required :

- (i) ..... is the pregnancy sustaining hormone.

- (ii) The enzyme secreted by acrosome is ..... that help the penetration of sperm inside the ovum.
- (iii) At the time of ovulation, the female gamete is at ..... stage.
- (iv) The failure of testosterone hormone secretion causes..... .
- (v) The process of release of mature sperms into the lumen of seminiferous tubules is called .....
- (vi) Which hormone is secreted by placenta at the time of child birth ?
- (vii) In pregnancy, the corpus luteum start degenerating after 13th to 17th week and changes into a white coloured endocrine gland is called..... .
- (viii) Which protein help in the fusion of the sperm with the egg membrane ?
- (ix) Which hormone is the precursor for the synthesis of estrogens ?
- (x) Which endocrine gland secretes female sex hormone, progesterone ?

1×10=10

### Section-B

2. (a) Discuss the role of chromosomes in sex differentiation.
- (b) Give comparative account of gonoducts and their separation from urinary ducts in male chordates. 5,5
3. (a) Discuss the role of hormones in the development and differentiation of sex in vertebrates.
- (b) Give an account of hypophyseal-hypothalamic-gonidial axis in females. 5,5

### Section-C

4. (a) Explain the process of spermatogenesis and its hormonal regulation.
- (b) Discuss the associated reproductive glands in male. 7,3
5. (a) Describe the male reproductive system of rat.
- (b) Discuss the role of epididymis in male reproductive system. 7,3

### Section-D

6. (a) Discuss the process of fertilization.
- (b) Give an account on the transport of gametes in female genital tract. 5,5

7. (a) Write a detailed account of lactation and its hormonal regulation.
- (b) Discuss the implantation of human blastocyst. 7,3

### Section-E

8. (a) Write about the various methods of contraception and birth control.
- (b) Give the main causes of infertility in males. 7,3
9. Write short notes on the following :
- (i) Sperm bank
  - (ii) Endometrial function test
  - (iii) Frozen embryo
  - (iv) GIFT
- 2.5×4=10

Roll No. ....

Total No. of Questions : 9]  
(2042)

[Total No. of Printed Pages : 4

**UGC (CBCS) IVth Semester (New)  
Examination**

**153**

**B.Sc. ZOOLOGY**

**(Genetics and Evolutionary Biology)**

**(Core)**

**Paper : ZOOL 401**

**Time : 3 Hours]**

**[Maximum Marks : 50**

**Note :-** Attempt *five* questions in all. Question No. 1 in Section-A is compulsory. Attempt *one* question each from Section-B, C, D and E. Different parts of a question must be attempted at one place together.

**Section-A**

**(Compulsory Question)**

1. (A) Do as required :

- (i) The type of genetic interaction when the activity of one gene is suppressed by a non-allelic gene is called as .....

(ii) Allelomorphs represent a pair of contrasting characters. (True/False)

(iii) Gene complement of an individual is called .....

(iv) Holandric genes are present on .....

(v) Who coined the term crossing over ?

(vi) Exposure to which of the following radiations results in thymine dimer formation.

(a) X-rays (b) UV-rays

(c) Cosmic rays (d) None of these

(vii) Which of the following gases was not used by Miller in his experiment :

(a) Oxygen (b) Hydrogen

(c) Methane (d) Ammonia

(viii) Name the island where Darwin's finches were observed.

(ix) The intermediate population between two ecotypes is called as :

(a) Species (b) Deme

(c) Cline (d) All of these

(x) The probable cause of extinction of dinosaurs was meteorite striking.

(True/False)

(B) Explain the following :

- (i) Barr eye
- (ii) Pseudodominance
- (iii) Episomes
- (iv) Chiasmata

4×2=8

### Section-B

2. (a) Explain different postulates of the chromosome theory of inheritance and draw a parallelism between chromosomes and Mendelian factors.
- (b) Give a brief account of complimentary genes with example. 5,3
3. (a) Give a comprehensive account of extrachromosomal inheritance. How is it different from nuclear inheritance ?
- (b) Explain polygenes and their inheritance with any example you have studied. 4,4

### Section-C

4. (a) Define inversion and explain different types with the help of diagrams.
- (b) What do you mean by dosage compensation. 4,4
5. (a) Give a detailed account of different chemical mutagens and add a note on tautomerization.
- (b) What mechanism control sex determination in birds. 5,3



### Section-D

6. (a) Citing suitable examples explain the theory of inheritance of acquired characters about evolution.
- (b) Write a short note on Neo-Darwinism. 5,3
7. (a) What are Fossils ? How carbon dating can be used to determine the age of these.
- (b) Name different evolutionary forms of horse and give morphology of ruminating horse. 5,3

### Section-E

8. (a) What do you understand by speciation. Discuss how a homogeneous population can lead to the formation of different species.
- (b) Explain adaptive radiation. 5,3
9. (a) What is mass extinction. Explain briefly the different causes.
- (b) Differentiate between monotypic and polytypic species. 5,3

Roll No. ....

Total No. of Questions : 9]  
(2041)

[Total No. of Printed Pages : 4

**UG (CBCS) IIIrd Year (Annual) Examination**  
**2543**

**B.Sc. ZOOLOGY**  
(Applied Zoology)  
(DSE-IA)

Paper : ZOOL 301(A)TH

Time : 3 Hours]

[Maximum Marks : 50

*Note* :- Attempt *five* questions in all. Q. No. 1 in Section A is compulsory. Attempt *one* question from each Section. Attempt all Parts of a question together.

**Section-A**

**Compulsory Question**

1. Do as directed :

(i) The host in which the parasite passes its sexual phase of life is called :

- (a) Definitive Host      (b) Secondary Host  
(c) Carrier Host      (d) Obligate Host

(ii) Causative organism of Typhoid is .....

(iii) Secondary host of *Trypanosoma gambiesis* is :

(a) *Glossina palpalis*

- (b) Man  
 (c) Anopheles Mosquito  
 (d) Plasmodium
- (iv) Infective stage in the life cycle of *Ancylostoma duodenale* is :  
 (a) Rhabditiform larva (b) Filariform larva  
 (c) Planula (d) None of these
- (v) The synchronisation of the estrous cycle is done by using :  
 (a) GnRH and FSH (b) L.H.  
 (c) Progesterone (d) All of these
- (vi) ..... is used instead of pituitary extract in induced breeding in fish.
- (vii) Vector for yellow fever is :  
 (a) *Aedes aegyptii* (b) *Anopheles*  
 (c) *Culex* (d) None of these
- (viii) *Sitophilus oryzae* is the pest of :  
 (a) Wheat (b) Rice  
 (c) Sugarcane (d) Lemon
- (ix) In 'Higher Welfare' system, chickens are kept indoors but with more space *i.e.* :  
 (a) 14 to 18 birds per square meter  
 (b) 14 to 16 birds per square meter  
 (c) 15 to 19 birds per square meter  
 (d) 18 to 20 birds per square meter
- (x) Fish is rich in ..... which prevents coronary heart diseases.

1×10=10

### Section-B

2. (a) Explain in brief the treatment, prevention and control measures of the following :
- (i) Tuberculosis
  - (ii) Typhoid
- (b) Write points of differences between :
- (i) Symbiosis
  - (ii) Commensalism 6+4=10
3. (a) Name the causative agent and mode of infection of the following :
- (i) Epidemic typhus
  - (ii) Syphilis
  - (iii) Relapsing fever
- (b) Explain diagnosis and treatment of the following pathogenic bacteria :
- (i) Rickettsia
  - (ii) Borrelia 6+4=10

### Section-C

4. (a) Describe the life cycle and cytostructure of *Plasmodium vivax*.
- (b) Discuss in detail Morphology and life cycle of *Wuchereria bancrofti*. 5+5=10
5. (a) Write short notes on the following :
- (i) Life cycle of *Helicoverpa*
  - (ii) Damage caused by larva of *Papilio*
  - (iii) Control of *Tribolium*

(b) Discuss the distribution, host plants and control measures of the following :

(i) *Callosobruchus*

(ii) *Pyrilla*

(iii) *Perpusilla*

6+4=10

**Section-D**

6. (a) Discuss in detail distribution, biology and medical importance of *Pediculus*.

(b) Describe in detail the methodology of artificial insemination in cattle.

5+5=10

7. (a) Discuss in detail the methods of Estrous synchronization in cattle.

(b) Discuss taxonomic position, life cycle and medical importance of *Xenopsylla cheopis*.

5+5=10

**Section-E**

8. (a) Write in detail on the egg processing function.

(b) Explain breeding of fish in bundhs.

5+5=10

9. Write notes on the following :

(i) Induced breeding in fish.

(ii) Health hazards faced by poultry farmers.

(iii) Give the composition of diluting fluid used for storing sperm.

(iv) Which *two* mosquitoes act as vectors of Zika virus ?

(v) What are Peyer's patches ?

2×5=10

Roll No. ....

Total No. of Questions : 9]  
(1049)

[Total No. of Printed Pages : 4

**UG (CBCS) Ist Year Annual Examination**  
**2011**

**B.Sc. ZOOLOGY**

(Animal Diversity)

(Core)

Paper : ZOOL 101 TH

**Time : 3 Hours]**

**[Maximum Marks : 50**

*Note* :- Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is compulsory.

**Section-A**

**(Compulsory Question)**

1. Do as directed :

- (i) The flagellum arises from the ..... within the cell.
- (ii) Coral reef forming coelentrates belong to the class .....

(iii) An anti-coagulant extracted from leeches is known as :

- (a) Hypnotoxin
- (b) Hirudin
- (c) Filamin
- (d) Actinin

(iv) Extinct arthropods belong to the subphylum .....

(v) What is Autotomy ?

(vi) What is Paedomorphosis ?

(vii) List *two* mammalian characters of Crocodiles.

(viii) Thirteen vertebra in pelvic region of Aves unite to form .....

(ix) Under which order Bats are included ?

(x) Write down *three* classes of Phylum Porifera.

### Section-B

2. (a) What is flagellar propulsion and write in detail a note on swimming in *Euglena*.
- (b) Give a detail account of canal system of *Sycon*. 5+5=10

*Or*

3. (a) Discuss in detail and draw a well labelled diagram showing polymorphism in *Physalia*.
- (b) Classify phylum platyhelminthes, giving characteristics features and at least *two* examples of each group. 5+5=10

### Section-C

4. (a) Elaborate in detail the origin of metameric segmentation in Annelids.
- (b) Write a note on vision in Arthropoda. 5+5=10

*Or*

5. (a) Discuss general characters of Mollusca.
- (b) Discuss water vascular system in Echinoderms. 5+5=10



### Section-D

6. (a) Discuss the affinities between Chordates and Urochordates.
- (b) Discuss in detail *two* major groups of living agnathans. 5+5=10

*Or*

7. (a) Discuss classification of fish upto orders, giving characters and examples of each group.
- (b) Write an essay on parental care in Amphibians. 5+5=10

### Section-E

8. (a) Draw a well labelled diagram of biting mechanisms in poisonous snakes.
- (b) Discuss flight adaptations in Class Aves. 5+5=10

*Or*

9. (a) Discuss origin of mammals in detail.
- (b) Discuss general characters of Class Aves. 5+5=10

Roll No. ....

Total No. of Questions : 9]  
(2111)

[Total No. of Printed Pages : 4

**UGC (CBCS) Ist Semester (New)  
Examination**

**1406**

**ZOOLOGY**

**(Animal Diversity)**

(Core)

**ZOOL 101**

**Time : 3 Hours]**

**[Maximum Marks : 50**

**Note :-** Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is compulsory.

**Section-A**

**(Compulsory Question)**

1. (A) Choose the correct option or fill in the blanks or write true or false :

(i) Incurrent canals communicate with the radial canals by :

(a) Apopyles (b) Prosopyles

(c) Dermal ostia (d) Gastral ostia

- (ii) Locomotory organelles in Protozoa are ..... pseudopodia and .....
- (iii) The main function of dactylozooids is :  
(a) Reproduction (b) Excretion  
(c) Protection (d) Respiration
- (iv) ..... are concerned with excretion in flatworms.
- (v) Each proglottid of tapeworm has one testis and many ovaries. (True/False)
- (vi) Larva of annelids is .....
- (vii) Which of the following are known as tunicates ?  
(a) Hemichordates  
(b) Urochordates  
(c) Cephalochordates  
(d) Cyclostomes
- (viii) Periodical replacement of exoskeleton is called moulting or .....
- (ix) Scroll valve is present in ..... fishes.
- (x) The only skin gland present in the birds is ..... gland.

**(B)** Write short notes on the following :

(i) Cysticercosis

(ii) Pseudopodia

(iii) Eutely

(iv) Cnidoblasts

2×4=8

### Section-B

2. (a) Give the detailed classification of phylum Porifera up to classes level along with their characters.

(b) Write the unique features of Phylum Cnidaria.  $5+3=8$

3. (a) Give the general characters of Nematelminthes. Also give the parasitic adaptations of *Ascaris lumbriciodes*.

(b) Make a well labelled diagram of a mature proglottid of *Taenia solium*.  $5+3=8$

### Section-C

4. (a) Describe the general characters of Phylum Mollusca.

(b) Give the structure and functions of tube feet of echinoderms.  $5+3=8$

5. (a) Write a detailed note on structure and working of a compound eye in arthropods.

(b) What are the unique features of phylum Annelida ?

5+3=8

### Section-D

6. (a) Enlist the general characters of super class Pisces.

(b) Differentiate between urochordates and cephalochordates.

5+3=8

7. (a) Describe the parental care in Anura and Urodela.

(b) Enlist the diagnostic characters of chordates. 5+3=8

### Section-E

8. (a) Differentiate between poisonous and non-poisonous snakes.

(b) Enlist the unique features of class Aves. 5+3=8

9. (a) Give the classification of mammals only up to infra classes along with their important characters.

(b) Comment upon the statement :

The birds are glorified reptiles.

5+3=8.

Total No. of Questions : 9] [Total No. of Printed Pages : 4  
(1108)

**UG (CBCS) RUSA Ist Semester (Old)  
Examination**

**1213**

**ZOOLOGY  
(Invertebrates-II)**

(Major)

(Minor for IIIrd Semester)

**BSCZOO-0102**

**Time : 3 Hours]**

**[Maximum Marks : 40**

**Note :-** Section A is compulsory. Select *one* question each from Sections B, C, D and E. All questions carry equal marks.

**Section-A**

**(Compulsory Question)**

1. Fill up the following with suitable terms or words :

- (i) Mouth of *Ascaris* is surrounded by .....  
lips.
- (ii) ..... anal styles occur in .....  
cockroach.

- (iii) Larva of *Musca domestica* is called .....
- (iv) Shell in molusca is secreted by .....
- (v) *Asterias* belongs to class .....
- (vi) Which segments comprise clitellar region of *Pheritima* ?
- (a) 8, 9, 10
- (b) 12, 13, 14
- (c) 14, 15, 16
- (d) 16, 17, 18 1×6=6
- (vii) Write a short note on social insects. 2

### Section-B

2. (i) Describe life history of *Ascaris*.
- (ii) Enumerate any four differences between male and female *Ascaris*. 6+2=8
3. (i) Describe the circulatory system of earthworm in the anterior thirteen segments.
- (ii) Write an ecological note on earthworm. 6+2=8

### Section-C

4. (i) Describe siphoning and spongying type of mouth-parts.
- (ii) Explain briefly, nuptial flight and swarming in honey bees. 6+2=8
5. (i) Describe filter feeding in polychaetes.
- (ii) Write short notes on the following :
- (a) Vermiculture
- (b) Metamerism 4+2+2=8

### Section-D

6. (i) Classify Mollusca up to orders with special reference to the classes cephalopoda and scaphoda by giving suitable examples.
- (ii) Write a brief note on foot in decapoda. 6+2=8
7. (i) Discuss the respiratory system of cockroach.
- (ii) Draw well labelled diagram of L.S. of Ommatidium. 6+2=8



### Section-E

8. (i) Describe water vascular system of starfish with the help of a well labelled diagram and also comment upon its significance.
- (ii) Give a brief note on phylogenetic position of echinoderms. 6+2=8
9. (i) Give a detailed account of the larval forms that occur in life history of a star fish.
- (ii) Write short notes on the following w.r.t. star fish :
- (a) Pedicellariae
- (b) Polian vesicles 6+2=8

Total No. of Questions : 9]  
(1048)

[Total No. of Printed Pages : 4

**UGC (CBCS) B.Sc. IVth Semester (New)  
Examination**

**1043**

**ZOOLOGY**

**(Genetics and Evolutionary Biology)**

(Core)

**Paper : ZOOL-401**

**Time : 3 Hours]**

**[Maximum Marks : 50**

**Note :-** Attempt *five* questions in all. Question No. 1 contained in Section-A is compulsory. Attempt *one* question each from Section-B, C, D and E. Different parts of a question must be attempted at one place together.

**Section-A**

**(Compulsory Question)**

1. (A) Do as required :

- (i) Name the scientists who discovered Mendel's law simultaneously.
- (ii) Linked genes are located in ..... chromosomes.
- (iii) ..... genes are transmitted directly from father to sons.

- (iv) The particles that lie in the cytoplasm and control certain traits are called..... .
- (v) Colchicines induce mutation by .....
- (vi) The part of gene that undergo recombination is termed .....
- (vii) Macroevolution is also known as :
- (a) Genetic Drift
  - (b) Adaptive Radiation
  - (c) Random selection
  - (d) Bottleneck's effect
- (viii) The first primitive living systems that appeared on earth are called..... .
- (ix) Ancon sheep is a evidence in favour of :
- (a) Mutation theory
  - (b) Theory of inheritance of acquired character
  - (c) Theory of natural selection
  - (d) None of these
- (x) Natural selection really means :
- (a) Struggle for existence
  - (b) Maintains the number of species
  - (c) Survival of the fittest
  - (d) Elimination of the unfit
- 1×10=10

Write short notes on following :

- (i) Test Cross
- (ii) Interference and Coincidence
- (iii) Dosage Compensation
- (iv) Reproductive isolation

4×2=8

**Section-B.**

2. (a) Define cytoplasmic inheritance. Give difference between cytoplasmic inheritance and chromosomal inheritance. Explain cytoplasmic inheritance with suitable examples. 5
- (b) State and explain law of purity of gametes. Give reason for Mendel's success in formulating clear cut laws of heredity. 3
3. (a) What is crossing over ? Explain its types and mechanism. 5
- (b) Explain Codominance. If a person heterozygous for blood group AB marries a person homozygous for blood group O, what is the blood groups of all their children ? 3

**Section-C**

4. (a) What is Aneuploidy ? Describe various types of aneuploidy. How is aneuploidy produced ? 5
- (b) Differentiate between Paracentric and Pericentric inversions. 3

5. (a) What are different kinds of polyploids ? How will you distinguish between autopolyploids and allopolyploids ? 5
- (b) Define mutation. Differentiate between spontaneous and induced mutation. 3

### Section-D

6. (a) Explain synthetic theory of evolution. 5
- (b) What is Pasteur's experiment to prove theory of Biogenesis ? 3
7. (a) What is Natural selection ? Explain three types of natural selection with one example each. 5
- (b) Explain that the variations are the raw materials for natural selection. 3

### Section-E

8. (a) What is Speciation ? How does it occur ? Give the various modes of speciation. 5
- (b) What are Fossils ? How are they dated ? 3
9. (a) What is mass extinction ? Explain the causes of mass extinction of species. 5
- (b) Define and describe adaptive radiations. 3

Roll No. ....

Total No. of Questions : 5] [Total No. of Printed Pages : 4  
(2043)

**UG (CBCS) RUSA IInd Semester (Old)  
Examination**

**862**

**ZOOLOGY**

**(Biology of Chordata-I)**

(Major/Minor)

**Paper : BSCZOO-0203**

**Time : 3 Hours]**

**[Maximum Marks : 40**

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*Note :- Attempt five questions in all, selecting one question each Section. Question No. 1 is compulsory.*

**(Compulsory Question)**

1. (A) Fill in the blanks :

(i) Larva of Hemichordates is called .....

(ii) ..... is the forerunner of Thyroid gland in Branchiostoma.

(iii) ..... vertebrates are called Agnatha.

(iv) A special type of tail in cartilaginous fishes is .....

(v) Bony fishes have ..... pair of gills.

(vi) The larva of cyclostomes is ..... .  $1 \times 6 = 6$

(B) Write short notes on the following :

(a) Main division of sub-phylum-Vertebrata.

(b) Larva of Balanoglossus.  $2 \times 2 = 4$

### Section-A

2. (a) Name the different theories of origin of chordates and explain the Ascidian theory.

(b) Write a short note on Ammocoetes larva.  $5 + 2\frac{1}{2} = 7\frac{1}{2}$

*Or*

(a) Give the characteristics of sub-Phylum-vertebrata.

(b) Differentiate between sub divisions- Agnathostomata and Gnathostomata in brief.

$5 + 2\frac{1}{2} = 7\frac{1}{2}$

### Section-B

3. (a) Describe the retrogressive metamorphosis met in Urochordata.
- (b) Give the distinguishing characters of class- Ascidacea.  $5+2\frac{1}{2}=7\frac{1}{2}$

*Or*

- (a) Describe the general characters of Cephalochordates.
- (b) Write the economic importance of Fishes.  $5+2\frac{1}{2}=7\frac{1}{2}$

### Section-C

4. (a) Describe the Nervous system of Scoliodon in detail.
- (b) Enlist atleast three similarities between cyclostomes and cephalochordates.  $5+2\frac{1}{2}=7\frac{1}{2}$

*Or*

- (a) Describe the accessory respiratory organs met in bony fishes.
- (b) Write a note on the placoid scale.  $5+2\frac{1}{2}=7\frac{1}{2}$



### Section-D

5. (a) What is Osmoregulation ? Explain it in Fishes.  
(b) Give the characters of the order-Dipnoi.  $5+2\frac{1}{2}=7\frac{1}{2}$

*Or*

- (a) Write an essay on migration of fishes  
(b) Enumerate food fishes of India.  $5+2\frac{1}{2}=7\frac{1}{2}$