

**INVERTEBRATES - I**

Under CBCS – Credit 4

Time: 3 Hours

Max. Marks: 75

**SECTION – A****Answer ALL Questions :****(10 × 1 = 10)**

1. Endoerythrocytic cycle of Plasmodium occurs within the
  - a) RBC    b) Liver    c) Mosquito    d) Spleen
2. Which of the following spicules are needle like with pointed ends?
  - a) Triaxon    b) Monaxon    c) Tetraxon    d) None of the above
3. The nutritive zooids of Obelia colony are.
  - a) Medusa    b) Blastostyles    c) Polyps    d) Nematocyst
4. *Fasciola hepatica* causes a disease in sheep called
  - a) Ascariasis    b) Taeniasis    c) Schistosomiosis    d) Liver-rot
5. The larva of *Ascaris* is
  - a) Miracidium larva    b) Cercaria larva
  - c) Rhabditiform larva    d) Hexacanth larva
6. \_\_\_\_\_ are filamentous pointed pseudopodia.
7. \_\_\_\_\_ are endogenous buds produced by sponges.
8. Chemically coral reefs are formed of \_\_\_\_\_.
9. The animals exhibiting bilateral symmetry are known as \_\_\_\_\_.
10. \_\_\_\_\_ is a nematode parasite causing elephantiasis in man.

**SECTION – B****Answer ALL Questions :****(5 × 7 = 35)**

11. a) Give a brief note on types of nutrition exhibited by protozoans.  
(OR)  
b) Explain the life cycle of Entamoeba with a neat sketch.
12. a) Write short notes on spicules of sponges.  
(OR)  
b) What are the features and significance of gemmules of sponges?
13. a) List out the general characters of the phylum Coelenterata.  
(OR)  
b) Briefly explain polymorphism in Obelia colony.
14. a) Give an account of origin of metazoan from Volvox like colony.  
(OR)  
b) Differentiate between Trochophore and Syncytial theory for the origin of Bilateria.
15. a) Write down the general characters of the phylum Aschelminthes.  
(OR)  
b) Elucidate the pathology and control measures of *Enterobius*.

**SECTION – C****Answer any THREE Questions :****(3 × 10 = 30)**

16. Give a detailed account on Paramecium conjugation and its significance.
17. Write an elaborate account on canal system in sponges.
18. Explain in detail about composition, types and significance of coral reefs.
19. Describe the morphology of liver fluke with a neat labelled diagram.
20. Elaborate the life cycle of *Ascaris lumbricoides*.





**VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST**

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**B.Sc. Zoology** Degree (Semester) Examinations, November 2017

Part – III : Core Subject : First Semester : Paper – II

**INVERTEBRATES - II**

Under CBCS – Credit 4

Time: **3** Hours

Max. Marks: **75**

**SECTION – A**

**Answer ALL Questions :**

**(10 × 1 = 10)**

- The coelom arising from the gut is called
  - Enterocoelom
  - Haemocoelom
  - Acoelom
  - Pseudocoelom
- The last segment of the prawn bears a conical projection called
  - Carapace
  - Telson
  - Rostrum
  - Coxa
- Which of the following Arthropods are called as living fossils?
  - Millipedes
  - Centipedes
  - Scorpion
  - None of the above
- The coils of Pila shell are called
  - Sinistral
  - Suture
  - Lip
  - Whorls
- The commonly found starfish is
  - Asterias rubens*
  - Labeo rohita*
  - Catla catla*
  - Pinctada vulgaris*
- \_\_\_\_\_ is a side-foot of Nereis.
- \_\_\_\_\_ is the first hatched larva in most of the Crustaceans.
- Insects which yield useful products are called \_\_\_\_\_.
- The reversion of torsion is called \_\_\_\_\_.
- \_\_\_\_\_ is the fundamental larva of all echinoderms.

**SECTION – B**

**Answer ALL Questions :**

**(5 × 7 = 35)**

- Briefly explain the types of metamerism.
 

**(OR)**

  - Write short notes on burrowing forms of Polychaetes.
- Write down the general characters of the phylum Arthropoda.
 

**(OR)**

  - Comment on a typical appendage of prawn with a neat sketch.
- Explain the external characters of Centipede.
 

**(OR)**

  - List out the salient features of Social life in Insects.
- Write about Shell of Pila.
 

**(OR)**

  - What are the advantages and disadvantages of Torsion?
- List out the general characters of the phylum Echinodermata.
 

**(OR)**

  - Elucidate the salient features of Dipleurula and Bipinnaria larva.

**SECTION – C**

**Answer any THREE Questions :**

**(3 × 10 = 30)**

- Describe the morphology of Nereis with a neat labelled diagram.
- Elaborate the various larval forms occur in the life cycle of Crustaceans.
- Explain in detail about economic importance of Insects.
- Discuss- Cephalopods are advanced Molluscs.
- Write an elaborate account on water-vascular system in Star fish.




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**B.A./B.Sc.** Degree (Semester) Examinations, November 2017

Part – IV : NME Subject : First Semester : Paper – I

**HUMAN ANATOMY**

Under CBCS – Credit 2

Time: 2 Hours

Max. Marks: 75

**SECTION – A**
**Answer ALL Questions:**
**(10 × 1 = 10)**
**Choose the best option:**

- Which one is the epidermal derivative?  
 a) Hair      b) Blood Vessel      c) Muscle      d) Nerve
- Which one of the following is not a part of small intestine?  
 a) Caecum      b) Duodenum      c) Jejunum      d) Ileum
- During the process of respiration in human beings, the exchange of gases takes place in  
 a) Alveoli      b) Bronchi      c) Bronchiole      d) Pleura
- Which blood group is called universal Donor?  
 a) O      b) A      c) B      d) AB
- Which is the photoreceptor of human?  
 a) Eye      b) Ear      c) Tongue      d) Mouth

**Answer all:**

- Which is the liquid portion of blood?
- Which tissue initiate the heart beat?
- Name the functional unit of kidney.
- Name the hearing organ of ear.
- State the white calcareous material is coated in tooth crown.

**SECTION – B**
**Answer ALL Questions:**
**(4 × 10 = 40)**

- a) Explain the structure of skin with neat sketch.  
 (OR)  
 b) Draw the structure of tooth and give its functions.
- a) Comment on the blood groups.  
 (OR)  
 b) Give an account on human heart with neat diagram.
- a) Describe the structure of alimentary canal of human.  
 (OR)  
 b) Comment on the structure of lungs with neat sketch.
- a) Draw the structure of eye and mechanism of vision.  
 (OR)  
 b) Sketch and comment on male reproductive system of human.

**SECTION – C**
**Answer any Two Questions:**
**(2 × 12  $\frac{1}{2}$  = 25)**

- Write an essay on composition of blood.
- Draw the structure of human ear with neat labels and explain the mechanism of hearing.
- Give a detailed account on kidney of man and formation of urine with neat diagram.



**CELL BIOLOGY**

Under CBCS – Credit 4

Time: 3 Hours

Max. Marks: 75

**SECTION – A****Answer ALL Questions :****(10 × 1 = 10)**

- The first microscope was designed by
  - Hertwig
  - Jenssen and Hans
  - Schleiden
  - Von Mohl
- Lipid bilayer is
  - Hydrophilic
  - Hydrophobic
  - Hydrophilic & Hydrophobic
  - depends on the medium
- Highly convoluted folding in mitochondria are
  - Thylakoids
  - lamelle
  - Cristae
  - grana
- The haploid set of chromosomes is called
  - proteome
  - Gametes
  - genome
  - genes
- Genetic mutation occurs in
  - protein
  - RNA
  - DNA
  - Nucleus
- 1 Angstrom unit is \_\_\_\_\_ cm.
- Plasma membrane is impermeable to \_\_\_\_\_ molecule.
- In 70S ribosomes 'S' stands for \_\_\_\_\_.
- In \_\_\_\_\_ phase of cell division the arrangement of equatorial plane is observed.
- The type of sugar in DNA molecule is \_\_\_\_\_.

**SECTION – B****Answer ALL Questions :****(5 × 7 = 35)**

- Compare and contrast light and electron microscopes.  
(OR)  
b) Write short note on isolation of cellular components.
- Brief the structure of endoplasmic reticulum.  
(OR)  
b) Explain the functions of lysosome.
- Describe the ultra structure of nucleus.  
(OR)  
b) Explain different types of cancer.
- Explain why the mitochondria is the power house of cell.  
(OR)  
b) Write a short note on ribosomes.
- Brief the different types of RNAs.  
(OR)  
b) How are protein synthesized?

**SECTION – C****Answer any THREE Questions :****(3 × 10 = 30)**

- Give an account on the types of centrifugation and its application.
- Briefly explain structure and functions of plasma membrane.
- Explain the steps involved in Krebs cycle.
- Describe the structure and functions of giant chromosome.
- Give an account on Replication of DNA.





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**B.Sc. Zoology** Degree (Semester) Examinations, November 2017

Part – III : Core Subject : Third Semester : Paper – II

**GENETICS**

Under CBCS – Credit 5

Time: **3** Hours

Max. Marks: **75**

**SECTION – A**

**Answer ALL Questions :**

**(10 × 1 = 10)**

- The Test Cross is used to determine the
  - Genotype of the plant
  - phenotype of the plant
  - both a & b
  - none of these
- Polygenic inheritance is very common in determining characteristics
  - Quantitative in nature
  - Qualitative in nature
  - primarily hidden
  - not in keeping with mendelian genetics
- Who coined the term linkage?
  - Correns
  - Mendel
  - Morgan
  - deVries
- What would be the sex of an XXY individual?
  - Male
  - Female
  - Hermaphrodite
  - Mosaic
- Basic cause of Alzheimer's disease is
  - accumulation of acetylcholine mimics
  - degeneration of cholinergic nerve terminals
  - degeneration of adrenergic nerve terminals
  - accumulation of adrenaline mimics
- \_\_\_\_\_ represent a pair of contrasting characters.
- Theory of inheritance of the acquired character was proposed by \_\_\_\_\_.
- Crossing over occurs during \_\_\_\_\_ stage of cell division.
- Male pattern baldness is a \_\_\_\_\_ trait.
- Human chromosome banding patterns match most closely those of \_\_\_\_\_.

**SECTION – B**

**Answer ALL Questions :**

**(5 × 7 = 35)**

- Briefly explain about Mendel's law of inheritance.
 

**(OR)**

  - Write short notes on lethal genes.
- Write short note on Rh factor.
 

**(OR)**

  - Define the law of segregation. Explain it with an example.
- Explain in brief about linkage.
 

**(OR)**

  - Add note on Chromosomal mapping.
- Give an account on colour blindness.
 

**(OR)**

  - Explain in short about sex linked inheritance.
- Discuss about extra chromosomal inheritance.
 

**(OR)**

  - Significance of pedigree analysis.

**SECTION – C**

**Answer any THREE Questions :**

**(3 × 10 = 30)**

- Explain complementary gene with an example.
- Give an account on crossing over and its mechanism.
- Explain ABO blood grouping and its application.
- Discuss in detail about sex determination in animals.
- Write an essay on inborn error metabolism.




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**B.Sc. Zoology** Degree (Semester) Examinations, November 2017

Part – IV : Skill Based Subject : Third Semester : Paper – I

**PUBLIC HEALTH AND HYGIENE**

Under CBCS – Credit 2

Time: 2 Hours

Max. Marks: 75

**SECTION – A**
**Answer ALL Questions:**
**(10 × 1 = 10)**

- The science of well being of humans and preventing disease is called
  - Washing
  - Bathing
  - Hygiene
  - Well-being
- The cheapest method of refuse disposal is:
  - Sanitary fills
  - Incineration
  - Dumping at sea
  - Composting
- The best vaccine for rabies in human is:
  - Sheep brain vaccine
  - Inactivated duck embryo vaccine
  - Human diploid cell vaccine
  - Inactivated chick embryo vaccine
- Which is the symptom of Japanese encephalitis?
  - High Fever
  - Bloody stools
  - Stomach pain
  - All the above
- The Headquarter of World Health Organization (WHO) is located.
  - Geneva
  - Congo
  - Manila
  - New York
- Define: Public health and hygiene.
- What is personal hygiene?
- Mention the symptoms of Mumps.
- Define mental health?
- What is first Aid?

**SECTION – B**
**Answer ALL Questions:**
**(4 × 10 = 40)**

- Write a note on dietary role of proteins. Mention its significance.
 

**(OR)**

  - What is balanced diet? Give the importance of balanced diet in human health.
- Write short notes on effects of water pollution on human health.
 

**(OR)**

  - Give a brief account of causative agent, symptoms and control measures of Dengue fever.
- Describe the pathology, causative agent and symptoms of Tetanus.
 

**(OR)**

  - Discuss briefly the causes of Coronary Heart Disease (CHD).
- Explain the National Health Programmes in India.
 

**(OR)**

  - Give a brief account of occupational health hazards.

**SECTION – C**
**Answer any TWO Questions:**
**(2 × 12  $\frac{1}{2}$  = 25)**

- Explain the dietary constituents of foodstuffs.
- Give a detailed account on mode of transmission, incubation period, pathology, symptoms, and control measures of Diphtheria.
- Explain in detail the role and responsibilities of WHO and UNICEP.



**ANIMAL ORGANISATION**

Under CBCS – Credit 4

Time: 3 Hours

Max. Marks: 75

**SECTION – A****Answer ALL Questions:****(10 × 1 = 10)**

- Which one of the following is a fresh water organism of phylum Cnidaria and class Hydrozoa  
a) Hydra      b) Sponges      c) Amoeba      d) Euglena
- Basic unit of biological classification and a taxonomic rank  
a) Cell      b) Species      c) Genus      d) Order
- The process of engulfing \_\_\_\_\_ particle by a cell  
a) Phagocytosis      b) Pinocytosis  
c) Microcytosis      d) Macrocytosis
- Contractile vacuole is a subcellular structure involved in osmoregulation in  
a) Earthworm      b) Cockroach      c) Amoeba      d) Pila
- The respiratory pigment of earthworm is  
a) Haemoglobin      b) WBC      c) Chlorophyll      d) Platelets
- The locomotory organ of Amoeba \_\_\_\_\_.
- A nerve cell cluster is \_\_\_\_\_.
- Antennae are appendages used for \_\_\_\_\_ in arthropods.
- The excretory organ of earthworm \_\_\_\_\_.
- Ovaries are part of \_\_\_\_\_ reproductive system.

**SECTION – B****Answer ALL Questions:****(5 × 7 = 35)**

- Write about the coelom and its types.  
**(OR)**  
b) Classify chordate upto class with examples.
- Give an account on gills in fish.  
**(OR)**  
b) How respiration occurs in Fish?
- Write a short note on Calotes circulatory system.  
**(OR)**  
b) Give an account on locomotion in Paramecium.
- Highlight the nervous system in earthworm.  
**(OR)**  
b) Draw the structure of human ear and explain.
- With a neat labelled sketch explain the kidney of man.  
**(OR)**  
b) Discuss the male reproductive structure of Rabbit.

**SECTION – C****Answer any THREE Questions:****(3 × 10 = 30)**

- Enumerate the salient features of phylum Protozoa.
- How digestion occurs in Frog?
- Discuss about flight mechanism in Pigeon.
- Explain the photoreceptors in man.
- Describe the urine formation in man.




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**B.Sc. Zoology** Degree (Semester) Examinations, November 2017

Part – III : Core Subject : Fifth Semester : Paper – I

**BIOCHEMISTRY AND BIOPHYSICS**

Under CBCS – Credit 5

 Time: **3** Hours

 Max. Marks: **75**
**SECTION – A**
**Answer ALL Questions:**
**(10 × 1 = 10)**

- In biological systems which one of the following is an intermediate in carbohydrate and lipid metabolism  
 a) Glucose      b) Glycine      c) Glycerol      d) Glycogen
- "Molecular unit of currency" of intracellular energy transfer is  
 a) ATP      b) GTP      c) UTP      d) TTP
- The metabolic pathway in which cells use enzymes to oxidize nutrients,  
 a) Reductive phosphorylation      b) Oxidative phosphorylation  
 c) phosphorylation      d) all the above
- Measurement of energy in a thermodynamic system.  
 a) Enthalpy      b) Entropy      c) A & B      d. None of the above
- A measure of the tendency of a chemical species to acquire electrons and thereby be reduced is  
 a) Redox potential      b) Kinetic potential  
 c) Oxidative potential      d) None of the above
- \_\_\_\_\_ is a substance that dissociates into ions in solution acquires the capacity to conduct electricity.
- \_\_\_\_\_ is a numeric scale used to specify the acidity or basicity of an aqueous solution.
- \_\_\_\_\_ are macromolecular biological catalysts that accelerate chemical reactions.
- \_\_\_\_\_ are organic nonprotein molecules that bind with the protein molecule to form the active enzyme
- \_\_\_\_\_ is a metabolic pathway that results in the generation of glucose from non-carbohydrate carbon substrates

**SECTION – B**
**Answer ALL Questions:**
**(5 × 7 = 35)**

- a) Write about biologically important chemical bonds.  
 (OR)  
 b) List down the properties of amino acids.
- a) What are the functions of cholesterol?  
 (OR)  
 b) Classify enzymes with examples.
- a) Discuss the metabolic reactions of protein.  
 (OR)  
 b) Explain the metabolic steps in Beta oxidation.
- a) What are High energy compounds? Mention its importance.  
 (OR)  
 b) Give an account on biological oxidation.
- a) Enumerate the properties of colloidal solution.  
 (OR)  
 b) Discuss about thermodynamics law.

**SECTION – C**
**Answer any THREE Questions:**
**(3 × 10 = 30)**

- Classify protein and mention its properties.
- Describe the factors affecting enzyme action.
- Write down the metabolic steps in glycolysis.
- Explain the energy budget in the metabolism of major nutrients.
- Discuss the transport across cell membrane.






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**B.Sc. Zoology** Degree (Semester) Examinations, November 2017

Part – III : Core Subject : Fifth Semester : Paper – II

**BIOTECHNOLOGY**

Under CBCS – Credit 5

 Time: **3** Hours

 Max. Marks: **75**
**SECTION – A**
**Choose the correct answer :**
**(10 × 1 = 10)**

- The vectors which can replicate two or more hosts are
  - YACs
  - BACs
  - Shuttle vectors
  - Expression vectors
- The process of introducing the plasmid in to a suitable bacterial host cell is known as
  - Conjugation
  - Transduction
  - Transcription
  - Transformation
- In animal cell culture, glucose is added as for
  - carbon source
  - hydrogen source
  - oxygen source
  - hydroxyl group source
- Which of the following bacteria is being used as biopesticides?
  - Bacillus subtilis*
  - Bacillus thuringiensis*
  - Bacillus coccus*
  - Bacillus coenosporum*
- Use of microbes to reduce or eliminate toxic pollutants from contaminated sites is called
  - bioremediation
  - bio augmentation
  - biomagnifications
  - bio filtration

**Fill in the blanks:**

- Production of artificial vaccine, MAB, interferon and insulin are notable achievements in \_\_\_\_\_ biotechnology.
- A genomic library is screened for the presence of a particular gene done by a process called \_\_\_\_\_ hybridization.
- The in vitro techniques was first developed to demonstrate the totipotency of plant cell by \_\_\_\_\_ in 1902.
- The first cloned sheep was known as \_\_\_\_\_.
- Super bug (*pseudomonas putida*) was first developed by \_\_\_\_\_.

**SECTION – B**
**Answer ALL Questions :**
**(5 × 7 = 35)**

- a) Biotechnology is an interdisciplinary pursuit – Justify.  
(OR)  
b) Critically analyze mode of action and advantages of restriction enzymes.
- a) Discuss the procedure for construction of cDNA library.  
(OR)  
b) Summarize the procedure of southern blotting techniques to identify recombinants.
- a) Analyze the DNA finger printing method and its uses in forensic science.  
(OR)  
b) Evaluate the different steps involved in PCR.
- a) Expound the applications of transgenic Sheep and Fish.  
(OR)  
b) Enlist the different types of bio - pesticides used to insect control.
- a) Explain how bio gas is produced at large scale?  
(OR)  
b) Write an account on bio-mining.

**SECTION – C**
**Answer any THREE Questions :**
**(3 × 10 = 30)**

- Trace out different kinds of vectors with their applications.
- Critically examine procedure for DNA sequencing.
- Illustrate Agarose gel electrophoresis techniques.
- Give the detail account on mass production of SCP.
- Critically analyze the production of monoclonal antibodies production.





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**09EP51**

**B.Sc. Zoology** Degree (Semester) Examinations, November 2017

Part – III : Core Subject : Fifth Semester : Paper – I

**BIostatistics, Computer Applications & Bioinformatics**

Under CBCS – Credit 5

Time: **3** Hours

Max. Marks: **75**

**SECTION – A**

**Answer ALL Questions: (10 × 1 = 10)**

- A significant difference between the expected frequencies and the observed frequencies in one or more categories can be determined by
  - Chi square test
  - Probability
  - Standard deviation
  - Standard error
- A method of exchanging messages between people using electronics
  - Pager
  - Search engine
  - Telegram
  - e-mail
- A mathematical notation for representing numbers using digits or other symbols in a consistent manner
  - Digital system
  - Number system
  - Mathematical system
  - Analog system
- BLAST is an algorithm for comparing primary biological sequence information, such as.
  - the amino-acid sequences of proteins
  - the nucleotides of DNA sequences
  - A & B
  - None
- The study of the evolutionary history and relationships among individuals or groups of organisms is.
  - Pedigree analysis
  - Phylogenetic analysis
  - Genetic analysis
  - All the above
- \_\_\_\_\_ is a branch of mathematics dealing with the collection, analysis, interpretation, presentation, and organization of data.
- In computing, \_\_\_\_\_ is the information that has been translated into a form that is efficient for movement or processing.
- The difference between the lowest and highest value is \_\_\_\_\_.
- \_\_\_\_\_ is slightly better measure of absolute dispersion than the range.
- \_\_\_\_\_ is the measure of the likelihood that an event will occur.

**SECTION – B**

**Answer ALL Questions: (5 × 7 = 35)**

- Elaborate on different types of data.
 

(OR)

 Comment on frequency distribution.
- Calculate Range and Quartile deviation for the following.

Age	20	30	40	50	60	70	80
Nos.	3	61	132	153	140	51	3

- (OR)
- Enumerate the merits and demerits of Mean, Median and Mode.
  - Explain the different theorems of probability.
 

(OR)

 A bag contains 8 white and 3 red balls. If two balls are drawn at random what is the probability for
    - both are white
    - one in each colour.
  - What are the uses and applications of MS Office?
 

(OR)

 Comment on different types of web browsers.
  - Explain pair wise sequence alignment.
 

(OR)

 Explain Multiple sequence alignment.

**SECTION – C**

**Answer any THREE Questions: (3 × 10 = 30)**

- Explain the different types of diagrammatic representation of data.
- The marks of ten students are given below calculate mean, median, mode and standard deviation.
 

40, 41, 55, 48, 58, 60, 72, 35, 43, 48.
- Explain student's test and its application with an example.
- Explain history and generations of computer.
- Describe biological databases and its types.




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**B.Sc. Zoology** Degree (Semester) Examinations, November 2017

Part – IV : Skill Based Subject : Fifth Semester : Paper – I

**SERICULTURE**

Under CBCS – Credit 2

Time: 2 Hours

Max. Marks: 75

**SECTION – A**
**Answer ALL Questions:**
**(10 × 1 = 10)**
**Choose the best option:**

- The technique of joining of the parts of two plants is called
  - Grafting
  - Cutting
  - Transplantation
  - Layering
- The unwinding of silk thread from the cocoon is called
  - Silk reeling
  - Pruning
  - Mulching
  - Irrigation
- The Root rot disease of mulberry is caused by
  - Fungi
  - Bacteria
  - Virus
  - Nematode
- Which is the common pest of silkworm?
  - Uzi fly
  - House fly
  - Dragon fly
  - tse-tse fly
- Which part of silk gland draws out silk in the form of fine filament?
  - Spinneret
  - Prothoracic gland
  - Scent glands
  - Lyonnet gland

**Answer ALL:**

- Which method is used to cut off the branches of mulberry in periodically?
- Expand NSP
- What is flotation test?
- What is the role of Chandrika?
- How many instars are in the life cycle of *Bombyx mori*?

**SECTION – B**
**Answer ALL Questions:**
**(4 × 10 = 40)**

- Discuss the silk gland of silkworm with neat labelled diagram.  
(OR)
  - Explain different methods of Irrigation.
- Discuss the different types of defective cocoons.  
(OR)
  - What is pruning? Give its advantages.
- Describe the life cycle of *Bombyx mori*.  
(OR)
  - State the significance of Seedling propagation.
- what are the symptoms and causes of powdery mildew diseases and root rot disease of mulberry?  
(OR)
  - Expand and list out the functions of CSB.

**SECTION – C**
**Answer any TWO Questions:**
**(2 × 12½ = 25)**

- Write an essay on different methods of vegetative propagation in mulberry.
- Enumerate the physical characteristics of cocoons.
- Write an essay on rearing appliances used in sericulture.

