

## **CERTIFICATE COURSE IN VERMICULTURE**

**(Non-Semester)**

**(With effect from the academic year 2013-14)**

### **Eligibility for the Course**

Candidates for admission to Certificate course in Vermiculture could possess a Higher Secondary school Education in Science subjects with Biology

### **Duration of the Course**

One year Certificate course in Vermiculture course non-semester for One Year duration

### **Examination**

All the theory papers are of 3 hours duration each for a maximum of 100 marks with passing minimum of 35 marks. Practical examinations are also for 3 hours duration for a maximum of 100 marks and passing minimum of 35 marks.

#### Question Paper Pattern

Maximum marks: 100

Time: 3 hours

Part A (5 x 3 = 15)

Five short answer questions (One question from each unit)

Part B (5 x 8 = 40)

Paragraph questions (Total questions 8, out of which answers are to be given for any five questions;

Part C (3 x 15 = 45)

Total questions 5, out of which answers are to be given for any Three questions;

S.No	Theory & Practicals	Maximum Marks	Minimum Marks
1.	Biology Of Earthworms	100	35
2.	Vermitechnology	100	35

### **PAPER I: BIOLOGY OF EARTHWORMS**

#### **UNIT I - Morphology & Anatomy:**

Earthworms – Taxonomic position ,external features- shape, size,colour,segmentation, setae & clitellum. Body wall, coelom, locomotion, digestive, circulatory ,respiratory, excretory & nervous system.

#### **UNIT II - Biology:**

Reproductive system-Male & Female, copulation, cocoon formation & fertilization, development of earth worm.

#### **UNIT III - Habitat Ecology:**

Burrowers, casts, nocturnal, poikilothermal, ecological grouping – Epigeic species, Endogeic species and Anecics.

#### **UNIT IV - Diversity of species:**

Detailed study of *Lumbricus terrestris*, *Eisenia eugenia*, *Eudrilus Eugenia*, *Amyntas gracilus*, *Perionyx excavates*.

#### **UNIT V - Economic importance of Earthworms:**

In sustainable agriculture, organic farming, earthworm activities, soil fertility & texture, soil aeration, water impercolation, decomposition & moisture, bait & food.

#### **Text Book:**

- 1.Sultan Ahmed Ismail, 2005. The Earthworm Book, Second Revised Edition. Other India Press, Goa, India.
- 2.Bhatnagar & Patla,2007. Earthworm vermiculture and vermin-composting, Kalyani Publishers, New Delhi.
- 3.Jordan & Verma,2009. Invertebrate Zoology , Chand & Company Ltd.

#### **Reference Books:**

1. Edwards, C.A & P.J Bohlen, 1996. Biology and ecology of earthworms III Edn. Chapman & Hall N.Y.U.S.A.
2. Edwards, C.A & J.R Lofty Vermicology – The Biology of earthworm, 1997 Chapman & Hall Publications N.Y.U.S.A.
3. Lee, K.E. 1985. Earthworms their ecology and relationships
- 4.Aravind Kumar, 2005.Verms & Vermitechnology, A.P.H. Publishing Corporation, New Delhi.

## **PAPER II: VERMITECHNOLOGY**

### **UNIT – I**

Vermitechnology- Definition, history, growth and development in other countries & India, significance.

### **UNIT – II**

Vermiculture – definition, scope and importance; common species for culture; Environmental parameters; culture methods – wormery – breeding techniques; indoor and out door cultures - monoculture and polyculture – merits and demerits.

### **UNIT – III**

Vermicomposting of wastes in field pits, ground heaps, tank method, roof shed method, static pile windrows, top fed windrows, wedges & bin method, harvesting the compost, storage, Vermiwash-Preparation and application.

### **UNIT – IV**

Applications of vermiculture – Vermiculture Bio-technology, vermicomposting, use of vermicastings in organic farming/horticulture, earthworms for management of municipal/selected biomedical solid wastes; as feed/bait for capture/culture fisheries; forest regeneration.

### **UNIT – V**

Future perspectives – Predator / pathogen control in wormeries; Potentials and constraints for vermiculture in India. Marketing the products of vermiculture – quality control, market research, marketing techniques – creating the demand by awareness and demonstration, advertisements, packaging and transport, direct marketing. Visit to relevant Labs/Field Visits

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2. Bhatnagar & Patla, 2007. Earthworm vermiculture and vermin-composting, Kalyani Publishers, New Delhi

### **Reference Books:**

1. Mary Violet Christy, 2008. Vermitechnology, MJP Publishers, Chennai.

2. Aravind Kumar, 2005. Verms & Vermitechnology, A.P.H. Publishing Corporation, New Delhi.