



**RAFFLES  
UNIVERSITY**

**TEACHING PLAN:** Course Name: Fundamentals of Plant Pathology

|                                                           |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                        |                                |          |
|-----------------------------------------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------|----------|
| SCHOOL:<br>(SOAS)<br>SCHOOL OF<br>Agricultural<br>Science |                    | ACADEMIC SESSION: 2023 – 2024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                        | FOR STUDENTS’ BATCH: 2023-2027 |          |
| 1                                                         | Course Code.       | APP-101/APP-P-101                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                        |                                |          |
| 2                                                         | Course Title       | Course name: Fundamentals of Plant Pathology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                        |                                |          |
| 3                                                         | Credits            | 4 (3+1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                        |                                |          |
| 4                                                         | Learning Hours     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Contact Hours                                                          | 36                             |          |
|                                                           |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Assessment                                                             |                                |          |
|                                                           |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Guided Study                                                           |                                |          |
|                                                           |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Total hours                                                            | 100                            |          |
| 5                                                         | Course Objective   | 1. To understand the basic knowledge of plant pathology and related subjects in the current scenario of Indian and world Agriculture.<br>2. Develop an understanding of communication methods, resources utilization, identification and isolation of plant pathogens, and their economic management.<br>3. To study living, non-living and environmental causes of diseases or disorders of the plants.<br>4. To study the mechanism of plant disease development.<br>5. To study interaction between host/susceptible and the pathogens.<br>6. To develop systems of management of plant diseases and reducing losses caused by them. |                                                                        |                                |          |
| 6                                                         | Course Outcomes    | 1. Imparting concepts, nomenclature, classification and characters of pathogens.<br>2. Understanding of disease identification, nature of pathogens and different strategies for management of plant diseases.<br>3. Applying different principles and methods for plant disease management.<br>4. Able to distinguish the fungicides and antibiotics (mode of action and formulations) on the basis of Nature of pathogen.<br>5. Develop the skills of crops diseases identification and marketing of relevant pesticides.                                                                                                             |                                                                        |                                |          |
| 7                                                         | Outline syllabus:  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                        |                                |          |
| 7.01                                                      | Paper Code         | Units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Syllabus                                                               | Page Number s <sup>1</sup>     | Lectures |
| 7.02                                                      | APP-101/AP P-P-101 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Plant Pathology                                                        |                                |          |
|                                                           |                    | Unit –I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                        |                                |          |
|                                                           |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Importance of plant diseases, scope and objectives of Plant Pathology. | 1-7                            | 3        |
|                                                           |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Terms and concepts in Plant Pathology.                                 | 245-267                        | 4        |
|                                                           |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | History of Plant Pathology with special reference to Indian            | 1-7                            | 2        |

[illegible]

|      |                                  |                                                                                                              |  |  |
|------|----------------------------------|--------------------------------------------------------------------------------------------------------------|--|--|
|      |                                  | Defence mechanism in plants.                                                                                 |  |  |
|      |                                  | Epidemiology: Factors affecting disease development.                                                         |  |  |
|      |                                  | Principles and methods of plant disease management.                                                          |  |  |
|      |                                  | Nature, chemical combination, classification, mode of action and formulations of fungicides and antibiotics. |  |  |
|      |                                  | Nematodes: General morphology and reproduction.                                                              |  |  |
|      |                                  | Classification of Nematodes                                                                                  |  |  |
|      |                                  | Symptoms and nature of damage caused by plant nematodes ( <i>Heterodera</i> and <i>Meloidogyne</i> )         |  |  |
|      |                                  | Symptoms and nature of damage caused by plant nematodes<br><i>Anguina</i> and <i>Radopholus</i>              |  |  |
|      |                                  |                                                                                                              |  |  |
|      |                                  |                                                                                                              |  |  |
| 7.04 | <b>Unit -III<br/>(Practical)</b> | <b>Topic to be taught</b>                                                                                    |  |  |
|      |                                  | Acquaintance with various laboratory equipments and microscopy.                                              |  |  |
|      |                                  | Collection and preservation of disease specimen.                                                             |  |  |
|      |                                  | Preparation of media, isolation and Koch's postulates.                                                       |  |  |
|      |                                  | General study of different structures of fungi. Study of symptoms of various plant diseases.                 |  |  |
|      |                                  | Study of representative fungal genera.                                                                       |  |  |
|      |                                  | Staining and identification of plant pathogenic bacteria.                                                    |  |  |
|      |                                  | Transmission of plant viruses                                                                                |  |  |
|      |                                  | Study of phanerogamic plant parasites.                                                                       |  |  |
|      |                                  | Study of morphological features and identification of plant parasitic nematodes.                             |  |  |
|      |                                  | Sampling and extraction of nematodes from soil and plant material, preparation of nematode mounting.         |  |  |
|      |                                  | Study of fungicides and their formulations.                                                                  |  |  |
|      |                                  | Methods of pesticide application and their safe use.                                                         |  |  |
|      |                                  | Calculation of fungicide sprays concentrations.                                                              |  |  |
|      |                                  |                                                                                                              |  |  |
| 8    | <b>Course Evaluation</b>         |                                                                                                              |  |  |
| 8.1  | <b>CA: 30%</b>                   |                                                                                                              |  |  |
| 8.11 | <b>Attendance</b>                |                                                                                                              |  |  |
| 8.12 | <b>Home work</b>                 | 4 Assignments, 10%                                                                                           |  |  |
| 8.13 | <b>Quizzes</b>                   | 4 Quizzes, 80%                                                                                               |  |  |
| 8.14 | <b>Projects</b>                  | 1 Project, 5%                                                                                                |  |  |
| 8.15 | <b>Presentat ion</b>             | 1 Presentation, 5%                                                                                           |  |  |
| 8.16 | <b>Any other</b>                 | --                                                                                                           |  |  |
| 8.2  | <b>MTE</b>                       | 20%                                                                                                          |  |  |

|     |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8.3 | <b>End-term examination: 50%</b>     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 9   | <b>Text Books &amp; References</b>   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 9.1 | <b>Text book</b>                     | <ol style="list-style-type: none"> <li>1. Fundamental of Plant pathology, A.N. Chaubey, Rama Publishing house Meerut.</li> <li>2. A Text Book of plant Pathology, D.P. tripathi and H.P Shukla, Aman Publishing house Meerut.</li> <li>3. Plant Pathology, D. Alice and C. Jeyalaxmi, A.E. Publications Coimbatore.</li> <li>4. Principles of Plant pathology, P. Vidhyasekran., CBS Publishers &amp; Distribution and private limited.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 9.2 | <b>Journal and E-Book References</b> | <ol style="list-style-type: none"> <li>1. Plant pathogens &amp; principles of plant pathology, E-book, ICAR.</li> <li>2. Introduction to plant pathogens, E-book, Acharya N.G. Ranga agricultural university.</li> <li>3. Principles of plant pathology, E-book, Dr. P. Kishore Varma, Assistant Professor, Department of Plant Pathology Agricultural College, Aswaraopet.</li> <li>4.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 9.3 | <b>Video References</b>              | <a href="https://www.youtube.com/watch?v=5vH_4_5-WGs">https://www.youtube.com/watch?v=5vH_4_5-WGs</a><br><a href="https://www.youtube.com/watch?v=liHnCDVzRCA">https://www.youtube.com/watch?v=liHnCDVzRCA</a><br><a href="https://www.youtube.com/watch?v=dko_P0uZpW4">https://www.youtube.com/watch?v=dko_P0uZpW4</a><br><a href="https://www.youtube.com/watch?v=Iy0I5PrhVTc">https://www.youtube.com/watch?v=Iy0I5PrhVTc</a><br><a href="https://www.youtube.com/watch?v=SGhIRCSE8U8">https://www.youtube.com/watch?v=SGhIRCSE8U8</a><br><a href="https://www.youtube.com/watch?v=9Svtqi10P-k">https://www.youtube.com/watch?v=9Svtqi10P-k</a><br><a href="https://www.youtube.com/watch?v=fihc7LQp4G0">https://www.youtube.com/watch?v=fihc7LQp4G0</a><br><a href="https://www.youtube.com/watch?v=00E0kB7r7fE">https://www.youtube.com/watch?v=00E0kB7r7fE</a><br><a href="https://www.youtube.com/watch?v=6pqEwpAHsPs">https://www.youtube.com/watch?v=6pqEwpAHsPs</a><br><a href="https://www.youtube.com/watch?v=ZrogAKO3dhI">https://www.youtube.com/watch?v=ZrogAKO3dhI</a><br><a href="https://www.youtube.com/watch?v=MOsMQKmSDCY">https://www.youtube.com/watch?v=MOsMQKmSDCY</a> |
| 9.4 | <b>For Video lectures</b>            | Subscribe the channel. Agri Coaching Chandigarh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

#### Mapping of Outcomes v. Topics

| Outcome no. →<br>Syllabus topic↓ | 1 | 2 | 3 | 4 | 5 |
|----------------------------------|---|---|---|---|---|
| Paper Code. Unit I (a)           | ✓ |   |   |   |   |
| Paper Code. Unit I (b)           |   | ✓ |   |   |   |
| Paper Code. Unit I (c)           |   |   | ✓ |   |   |
| Paper Code. Unit II (a)          |   |   |   | ✓ |   |
| Paper Code. Unit II (b)          |   |   |   | ✓ |   |
| Paper Code. Unit II (c)          |   |   |   | ✓ |   |
| Paper Code. Unit III (a)         |   |   |   | ✓ |   |
| Paper Code. Unit III (b)         |   |   |   | ✓ |   |
| Paper Code. Unit III (c)         |   |   |   | ✓ |   |
| Paper Code. Unit IV (a)          |   |   |   | ✓ |   |
| Paper Code. Unit IV (b)          |   |   |   | ✓ |   |
| Paper Code. Unit IV (c)          |   |   |   | ✓ |   |
| Paper Code. Unit V (a)           |   |   |   | ✓ |   |
| Paper Code. Unit V (b)           |   |   |   | ✓ |   |
| Paper Code. Unit V (c)           |   |   |   |   | ✓ |

## QUESTION BANK

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1. **“Plant pathology” deals with the study of:-**
  - A. Causal organism and management
  - B. Causal organism and disease cycle
  - C. Disease cycle and management
  - D. Causal organism, disease cycle and management of plant diseases
2. **Factors responsible for disease occurrence :-**
  - A. Host and pathogen
  - B. Susceptible host and pathogen
  - C. Susceptible host ,virulent pathogen and favorable environment
  - D. Susceptible host and virulent pathogen
3. **The first book on plant pathology, entitled “Diseases of Cultivated Crops, their causes and their control” was written by :-**
  - A. Kuhn
  - B. Tillet
  - C. De Bary
  - D. Micheli
4. **The journal “Phytopathology” was begin to published in the year :-**
  - A. 1891
  - B. 1895
  - C. 1911
  - D. 1918
5. **In 1963 concept of vertical and horizontal resistance was given by :-**
  - A. Eriksson
  - B. Orton
  - C. Stakman
  - D. Vanderplank
6. **Gene for gene theory H.H. Flor worked with the rust of :-**
  - A. Wheat
  - B. Barley
  - C. Linseed
  - D. Pea
7. **Cedar-apple rust is caused by :-**
  - A. Hemileia vastatrix
  - B. Melampsora lini
  - C. Uromyces appendiculatus
  - D. Gymnosporangium juniperi-virginianae
8. **Mushrooms belongs to order :-**
  - A. Agaricales
  - B. Exobasidiales
  - C. Uredinales
  - D. Ustilaginales

9. **Generalized loss of turgidity and drooping of leaves or shoots are the symptoms of :-**  
A. Rust  
B. Smut  
C. Wilt  
D. Mildew
10. **Slimy molds belong to phylum :-**  
A. Myxomycota  
B. Zygomycota  
C. Oomycota  
D. Ascomycota
11. **Late blight of tomato is caused by :-**  
A. *Phytophthora cactorum*  
B. *Phytophthora cambivora*  
C. *Phytophthora infestans*  
D. *Phytophthora citrophthora*
12. **Special structures "rhizoids" are produced in the fungus:-**  
A. *Aspergillus*  
B. *Penicillium*  
C. *Mucor*  
D. *Rhizopus*
13. **Downy mildew of grapes is caused by :-**  
A. *Plasmopara halstedii*  
B. *Plasmopara viticola*  
C. *Peronospora destructor*  
D. *Peronospora effusa*
14. **The fungi, causing powdery mildews, are:-**  
A. Obligate parasites  
B. Facultative parasites  
C. Obligate saprophytes  
D. Facultative saprophytes
15. **"Sigatoka disease" of banana is caused by :-**  
A. *Mycosphaerella fragariae*  
B. *Mycosphaerella musicola*  
C. *Mycosphaerella citri*  
D. *Magnaporthe grisea*
16. **Smut of bajara is :**  
A. Seed borne  
B. Soil borne  
C. Air borne  
D. Seed and soil borne
17. **"Whip smut" of sugarcane is caused by :-**  
A. *Ustilago scitaminea*  
B. *Ustilago nuda*  
C. *Ustilago maydis*  
D. *Ustilago hordei*
18. **Heterocious nature of stem rust of wheat was demonstrated by :-**  
A. Anton De Bary

- B. Eriksson
  - C. Stakman
  - D. Craigie
- 19. . Long smut of sorghum is caused by :-**
- A. Sphacelotheca cruenta
  - B. Sphacelotheca reiliana
  - C. Sphacelotheca sorghi
  - D. tolyposporium ehrenbergii
- 20. . In black rust of wheat zero (0) stage of fungus is known as :-**
- A. Basidial
  - B. Uredial
  - C. Telial
  - D. Pycnidial
- 21. . Which one is poisonous mushroom ?**
- A. Pleurotus
  - B. Agaricus
  - C. Volvariella
  - D. Amnita
- 22. . “Mycorrhiza” is the association of :-**
- A. Fungi and Higher plants
  - B. Fungi and Algae
  - C. Fungi and Bacteria
  - D. Fungi and Insects
- 23. . “Lichens” shows which type of association :-**
- A. Symbiosis
  - B. Commensalism
  - C. Synergism
  - D. Antibiosis
- 24. . The smallest pathogenic agent is:-**
- A. Virus
  - B. Viroid
  - C. Virusoid
  - D. Prion
- 25. . Filters used in Laminar air flow are known :-**
- A. HEPA -filters
  - B. Asbestos-filters
  - C. Porcelin-filters
  - D. Sintered glass filters
- 26. . The “Quarantine laws” in USA were first enacted in :-**
- A. 1896
  - B. 1912
  - C. 1950
  - D. 1972
- 27. . “Grassy shoot” disease of sugarcane is caused by :-**
- A. Fungi
  - B. Bacteria

- C. Phytoplasma
  - D. Virus
28. . L-form bacteria do not possess:-
- A. Cell membrane
  - B. Cell wall
  - C. Mesosome
  - D. Ribosome
29. . Which bacterium is a flagellate:-
- A. Pseudomonas
  - B. Xanthomonas
  - C. Agrobacterium
  - D. Xylella
30. . Typical “stem-pitting symptoms are produced in the disease:-
- A. Citrus exocortis
  - B. Citrus tristeza
  - C. Citrus greening
  - D. Citrus canker
31. . Alternate host of Bajra rust is :-
- A. Tomato
  - B. Pea
  - C. Brinjal
  - D. Chilli
32. . The conversion of whole thallus into reproductive structure, is called:-
- A. Holocarpic
  - B. Eucarpic
  - C. Endocarpic
  - D. Mesocarpic
33. . Counter stain for gram positive bacteria as:-
- A. Crystal violet
  - B. Iodine
  - C. Saffranin
  - D. cotton blue
34. . Minimum magnification power of “Electron microscope” is :-
- A. 100 times
  - B. 1000 times
  - C. 10000 times
  - D. 100000 times
35. . The enlargement of host tissues due to excess cell division is called :-
- A. Hyperplasia
  - B. Hypertrophy
  - C. Hypoplasia
  - D. Hypotrophy
36. . Dispersal of plant pathogens through wind is known :-
- A. Hydrochory
  - B. Zoochory
  - C. Anemochory
  - D. Anthorochory

37. . Browning of vascular bundles occurs in the disease :-  
A. Wilt  
B. Smut  
C. Rust  
D. Bunt
38. . Sterilization of culture medium is done at a pressure of :-  
A. 10 psi  
B. 15 psi  
C. 20 psi  
D. 25 psi
39. . Van Everdingen (1933) evolved “Dutch rules” for the fungus :-  
A. *Puccinia striiformis*  
B. *Albugo candida*  
C. *Phytophthora infestans*  
D. *Pythium debaryanum*
40. . “Indian type culture collection” for fungi is located at :-  
A. Kolkata  
B. Hyderabad  
C. New Delhi  
D. Mumbai
41. . ” Striga” is a plant parasite:-  
A. Total stem parasite  
B. Total root parasite  
C. Partial stem parasite  
D. Partial root parasite
42. . “Pyricularin” is produced by the fungus :-  
A. *Pyricularia oryzae*  
B. *Fusarium oxysporum*  
C. *Helminthosporium maydis*  
D. *Helminthosporium victoriae*
43. . Fastidious vascular bacteria are mainly restricted to the region :-  
A. Epidermis  
B. Vascular bundles  
C. Cortex  
D. Pith region
44. . First plant pathogenic nematode was discovered by :-  
A. Needham  
B. Cobb  
C. Kuhn  
D. Devaine
45. . Bengal famine is related with the crop:-  
A. Wheat  
B. Paddy  
C. Potato  
D. Maize
46. . Pycnia with acervuli production is the feature of class:-  
A. *Hyphomycetes*

- B. Coelomycetes
  - C. Blastomycetes
  - D. Pyrenomycetes
47. . The ratio of copper sulphate and ammonium sulphate in “Cheshunt” compound is:-
- A. 2:11
  - B. 3:11
  - C. 5:11
  - D. 10:11
48. . Coenocytic mycelium is present in fungus :-
- A. Phytophthora
  - B. Ustilago
  - C. Puccinia
  - D. Alternaria
49. . Naked asci are produced in the class :-
- A. Discomycetes
  - B. Pyrenomycetes
  - C. Plectomycetes
  - D. Hemiascomycetes
50. 50. First produced systemic fungicide is :-
- A. Bordeaux mixture
  - B. Captan
  - C. Thiram
  - D. Carboxin
51. . Parasexuality phenomenon was first observed in the fungus :-
- A. Aspergillus nidulans
  - B. Aspergillus flavus
  - C. Aspergillus niger
  - D. Penicillium notatum
52. . The perfect stage of Helminthosporium is :-
- A. Thanatephorus
  - B. Mangnaporthe
  - C. Cochliobolus
  - D. Talaromyces
53. . Leaf smut of rice is caused by :-
- A. Entyloma oryzae
  - B. Urocystis tririci
  - C. Ustilago tririci
  - D. Ustilago nuda
54. . The total stem parasite is :-
- A. Loranthus
  - B. Orobanche
  - C. Striga
  - D. Cuscuta
55. . The cause of “black heart” disease of potato is :-
- A. Water stress
  - B. Frost injury

- C. High light intensity
  - D. Lack of oxygen
56. . The disease which takes more than one year to complete the disease cycle is known as :-
- A. Polyetic
  - B. Monocyclic
  - C. Polycyclic
  - D. Demicyclic
57. . Tundu disease of wheat is caused by Clavibacter with nematode:–
- A. Anguina tritici
  - B. Meloidogyne graminicola
  - C. Heterodera avenae
  - D. Ditylenchus angustus
58. . Viruses are mainly transmitted by :-
- A. Insects
  - B. Fungi
  - C. Bacteria
  - D. Nematodes
59. . The term “Boom & Burst cycle” for disease resistance was given by :-
- A. Flor
  - B. Priestley
  - C. Prusiner
  - D. Voinnet
60. . First resistance (R) gene cloned and sequenced in 1992 from maize is :-
- A. Hm – 1
  - B. Cf – 9
  - C. Pt – 0
  - D. Xa – 21
61. . Mycorrhiza supplies which nutrient in the plants :-
- A. Iron
  - B. Sulphur
  - C. Phosphorus
  - D. Nitrogen
62. . Pasteurization is done at temperature:-
- A. 62.8 °C
  - B. 80.0 °C
  - C. 90.7 °C
  - D. 100.0 °C
63. . The perfect stage of Aspergillus is :-
- A. Erotium
  - B. Thanetophorus
  - C. Glomerella
  - D. Gibberella
64. . “Khaira disease ” of rice is caused by deficiency of :-
- A. Nitrogen
  - B. Zinc
  - C. Potash
  - D. Phosphorus

65. . The organisms lacking a well defined nucleus are known as:-  
A. Fungi  
B. Protozoa  
C. Eukaryotes  
D. Prokaryotes
66. . Conidia and sporangia are produced by :-  
A. Viruses  
B. Fungi  
C. Bacteria  
D. Phytoplasma
67. . Solar heat treatment for the control of loose smut of wheat was given by :-  
A. Jensen  
B. Mitra  
C. Butler  
D. Luthra and Sattar
68. . Which toxin is host specific:-  
A. Tabtoxin  
B. Tentoxin  
C. Victorin  
D. Phaseotoxin
69. . Peach leaf curl disease is caused by :-  
A. Virus  
B. Bacterium  
C. Fungus  
D. Phytoplasma
70. . “Kresk phase” symptoms found in :-  
A. Latiblight of potato  
B. Black arm of cotton  
C. Bacterial leaf blight of rice  
D. Moko disease of banana
71. . Club root disease of cabbage was first reported by :-  
A. N.A.Cobb  
B. E.J.Butler  
C. Woronin  
D. K.C.Mehta
72. . Tungro disease of rice is caused by :-  
A. Bacteria  
B. Fungi  
C. Virus  
D. Phytoplasma
73. . Eriophyde mite is transmitting :-  
A. Little leaf of brinjal  
B. Bunchy top of banana  
C. Sterility mosaic of pigeon pea  
D. citrus greening
74. . Phytoplasma contains :-  
A. Only RNA

- B. Only DNA
  - C. Both RNA and DNA
  - D. Only protein coat
75. . Red leaf of cotton is a deficiency disease due to :-
- A. Copper
  - B. Iron
  - C. Boron
  - D. Nitrogen
76. 76. Ooze test is the diagnostic test for :-
- A. Bacteria
  - B. Virus
  - C. Nematode
  - D. Fungi
77. . Match the correct of the following Imperfect Stage Perfect Stage
- A. Aspergillus — a. Mycosphaerella
  - B. Cercospora— b. Cochliobolus
  - C. Cercospora— c. Glomerella
  - D. Bipolaris——d. Eurotium
- A. A-(a), B-(b), C-(c), D-(d)
  - B. A-(d), B-(a), C-(b), D-(c)
  - C. A-(d), B-(c), C-(b), D-(a)
  - D. A-(d), B-(c), C-(a), D-(b)
78. . The two important compounds of cell wall in most of the fungi are :-
- A. Glucan and cellulose
  - B. Peptidoglycan and cellulose
  - C. Chitin and cellulose
  - D. Peptidoglycan and Chitin
79. . Some pathogens secrete an iron chelating agent known as :-
- A. P.R.Proteins
  - B. Siderophores
  - C. Phytoalexins
  - D. Elicitors
80. . Which Fungicide is specific for downy mildew fungi :-
- A. Chlorothalonil
  - B. Plantvax
  - C. Metalaxyl
  - D. Vitavax
81. . An example of compound interest disease is :-
- A. Wilt of gram
  - B. Root rot of cotton
  - C. Stem rust of wheat
  - D. Club root of cabbage
82. . Local and systemic both infection are found in :-
- A. Covered smut of barley
  - B. Karnal bunt of wheat
  - C. White rust of Mustard
  - D. Black rust of wheat

83. . Virus is transmitted by which nematode?
- A. Globodera
  - B. Meloidogyne
  - C. Heterodera
  - D. Xiphinema
84. . Which of the following fungi is called weed of the laboratory?
- A. *Fusarium solani*
  - B. *Cercospora personata*
  - C. *Pyricularia oryzae*
  - D. *Aspergillus niger*
85. . Characteristic H-shaped structure of primary sporidia is found in :-
- A. *Neovossia*
  - B. *Ustilago*
  - C. *Sphaerotheca*
  - D. *Tilletia*
86. . White one is commonly known as grey mold fungus?
- A. *Penicillium italicum*
  - B. *Penicillium notatum*
  - C. *Botrytis cinerea*
  - D. *Aspergillus niger*
87. . *Gossypium arboreum* species of cotton are found resistant against disease :-
- A. Root rot
  - B. Wilt
  - C. Bacterial leaf blight
  - D. Leaf curl
88. . In which of the following fungi zoospores are formed inside vesicle?
- A. *Phytophthora*
  - B. *Phythium*
  - C. *Rhizoctonia*
  - D. *Albugo*
89. . *Taphrina maculans* causes the disease :-
- A. Leaf spot of turmeric
  - B. Tikka of groundnut
  - C. Powdery mildew of pea
  - D. Wilt of pigeon pea
90. . Perithecia with single ascus and simple appendages are found in the genus :-
- A. *Erysiphe*
  - B. *Uncinula*
  - C. *Sphaerotheca*
  - D. *Podosphaera*
91. . Coffee rust was first reported in 1868 from:-
- A. Brazil
  - B. Ceylon
  - C. India
  - D. Indonesia
92. . Which is of the following fungi is commonly known as white mold/stem rotting:-
- A. *Rhizoctonia solani*

- B. *Sclerotinia sclerotiorum*  
 C. *Fusarium solani*  
 D. *Albugo candida*
93. . Red onion is resistant to smudge due to presence of :-  
 A. Phenolic contents  
 B. Catechol and protocatechuic acid  
 C. Chlorogenic acid  
 D. Wax
94. . Anthracnose of grapes is caused by :-  
 A. *Elsinoe ampelina*  
 B. *Greenaria viticola*  
 C. *Plasmopara viticola*  
 D. *Uncinula necator*
95. . The symbiont bacterial genus is :-  
 A. *Xanthomonas*  
 B. *Clavibacter*  
 C. *Bacillus*  
 D. *Rhizobium*
96. . On culture media, mycoplasmal colonies appear as :-  
 A. Rod shaped  
 B. Helical  
 C. Spiral  
 D. Fried-egg appearance
97. . Tomato leaf curl virus is transmitted by:-  
 A. *Myzus persici*  
 B. *Bemisia tabaci*  
 C. *Thrips tabaci*  
 D. Infected plant material
98. . Match the correct of the following  
 A. Potassium dichromate —(a). Fixative  
 B. Agar-agar —(b). Cleaning solution  
 C. Lactophenol—(c). Mounting medium  
 D. Formalin acetic acid——(d).Solidifying agent  
 A. A-(a), B-(b), C-(c), D-(d)  
 B. A-(d), B-(b), C-(a), D-(c)  
 C. A-(a), B-(c), C-(d), D-(b)  
 D. A-(b), B-(d), C-(c), D-(a)
99. . Stem galls of coriander is caused by :-  
 A. *Fusarium*  
 B. *Alternaria*  
 C. *Protonaria*  
 D. *Cercospora*
100. . Which among the following is commonly known as oyster mushroom?  
 A. *Volvariella*  
 B. *Agaricus*  
 C. *Pleurotus*  
 D. *Lentinus*

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**Projects / Assignment (To be given to group of students)**