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63/2 (SEM-3) BOT-301

2022

(Held in 2023)

BOTANY

(Theory Paper)

Paper Code : BOT-301

(Microbiology and Plant Pathology)

Full Marks - 80

Pass Marks - 32

Time - Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following Multiple choice Questions : 1×4=4

(a) Bacterial resistance to antibiotics is transmitted by

- | | |
|------------------|---------------------|
| (i) Transduction | (ii) Transformation |
| (iii) Mutation | (iv) Plasmids |

(b) Archaea is considered as a separate group from bacteria and eukaryotes, based on

- (i) Genome sequence
- (ii) 16S rRNA gene sequence

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(iii) 23S rRNA gene sequence

(iv) EFTu sequence

(c) The domain Eukarya includes all the following except

(i) Fungi

(ii) Algae

(iii) Animals

(iv) Archaeal cells

(d) The process of controlled heating that was used to keep the wine from spoiling is called

(i) Curdling

(ii) Fermentation

(iii) Pasteurization

(iv) Tyndillization.

2. Answer the following questions : $2 \times 6 = 12$

(a) Write in brief about the chemical constituent of peptidoglycan.

(b) State two functions of complement proteins.

(c) Write definition of enriched media and selective media with suitable examples.

(d) What is the causal organism of Bovine spongiform encephalopathy? Write briefly on the causal organism of BSE disease.

(e) State the properties that indicator organism of contaminated water should have.

(f) What is appressorium? Write its function.

3. Write short notes on any six of the following :

$5 \times 6 = 30$

(a) Food preservation techniques

(b) Rhizosphere

(c) Waste water treatment

(d) Effect of pathogen on translation and transcription of host plant

(e) Structural and genetic features of virus

(f) Types of immune system

(g) Antigen presenting cells

(h) Causes of plant diseases

(i) Growth kinetics of Bacteria in growth media.

4. Answer any two of the following : $10 \times 2 = 20$

(a) Discuss in detail about the process of disease development in plants. What role does the environment play in disease development ?

$6 + 4 = 10$

- (b) Explain why the genetic recombination is called Horizontal gene transfer in bacteria. Write in brief about the different mechanisms of Horizontal gene transfer.

4+6=10

- (c) What is the region of antibody that binds with compatible epitopes of antigen called? Discuss the basic structure and functions of antibody molecule. Enumerate and discuss about the different classes of immunoglobins?

1+5+4=10

5. Answer any *one* of the following : $14 \times 1 = 14$

- (a) What is fermentation technology? What is the mechanism behind the production of ethanol? What types of micro-organisms are involved in it? Discuss the various steps involved in industrial production of alcohol (ethanol). Mention the uses of ethanol.

1+2+1+8+2=14

- (b) What is gene for gene concept? How do plants defend themselves from pathogens? Explain the molecular basis of defense mechanism in plants.

2+6+6=14