C 21550 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION APRIL 2022

Microbiology

MBG 4C 09 C—LANGUAGE, DATABASE MANAGEMENT SYSTEM AND SQL

(2019 Admission onwards)

Time : Two Hours Maximum : 60 Marks

Section A

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. Define Algorithm.
2. Write the use of scanf function.
3. Write the relevance of break statements.
4. What is an array ?
5. What are pointers ?
6. Discuss about switch statement.
7. Define entity.
8. Write the use of DCL commands.
9. What are null values ?
10. Explain any three symbols in flowchart.
11. How will you declare a local variable ?
12. What is a domain ?

(8 × 3 = 24 marks)

Section B

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. Write the purpose of function in programming.

14. What are escape characters? Explain with examples.

15. Discuss DDL and DML commands with suitable examples.

16. Write the basic concepts of ER model.

17. Write a note on nested subquery.

18. Discuss for loop in detail.

19. Define structure. Write its general syntax. Explain with an example.

(5 × 5 = 25 marks)

Section C

Answer any **one** *question.*
The question carries 11 *marks.*

20. Discuss different operators in C with suitable examples.

21. What is normalization ? Discus 1NF, 2NF, 3NF.

(1 × 11 = 11 marks)

C 21549 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2022

Microbiology

MBG 4C 04—IMMUNOLOGY AND MEDICAL MICROBIOLOGY

(2019 Admission onwards)

Time : Two Hours Maximum : 60 Marks

Section A

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. Tetanolysin.
2. Hepatitis B virus.
3. ID 50 and LD 50.
4. Prosodemic diseases.
5. Botulism.
6. Cholera toxin.
7. ARC.
8. Toxic shock syndrome.
9. Nosocomial infections.
10. Ig M.
11. Tinea Nigra.
12. TI antigens.

(8 × 3 = 24 marks)

Section B

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. Explain the pathogenesis of rabies.

14. Discuss deep mycoses giving any two examples.

15. Explain the pathogenesis of HIV infection.

16. Describe the structure of immunoglobulins with the help of a neat diagram.

17. What is Syphilis ? Explain its pathogenesis.

18. Explain the clinical features and pathogenesis of amoebiasis.

19. How Chikungunya is transmitted ? Write on its clinical features.

(5 × 5 = 25 marks)

Section C

Answer any **one** *question.*
The question carries 11 *marks.*

20. Explain the life cycle of malarial parasite. Write the clinical features of malaria.

21. Explain the pathogenesis of botulism. Add a note on infant botulism.

(1 × 11 = 11 marks)

C 21548 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION, APRIL 2022

Microbiology

MBG 4B 04—SOIL AND AGRICULTURAL MICROBIOLOGY

(2019 Admission onwards)

Time : Two Hours and a Half Maximum : 80 Marks

Section A

Answer atleast **ten** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall ceiling 30.

1. Causative agent of bunchi top of banana.
2. Gloeocapsa.
3. Write examples of any bacterial pesticides.
4. Synergism.
5. Nematophagus fungi.
6. Rhizosphere.
7. Symbiont.
8. Ectendo Mycorrhiza.
9. Humus.
10. Denitrification.
11. Associative symbiosis.
12. Azolla.
13. Amensalism.
14. Angular leaf spot of cotton.
15. Luminescent bacteria.

(10 × 3 = 30 marks)

Turn over

Section B

Answer atleast **five** *questions.*
Each question carries 6 *marks.*
All questions can be attended.
Overall ceiling 30.

16. Biofertilizer.
17. Role of microbes in ruminants.
18. Phosphorus cycle.
19. Soil fertility test.
20. Write on any two viral plant diseases.
21. Symbiotic nitrogen fixation.
22. Mycorrhiza.
23. Microbe-animal interactions.

(5 × 6 = 30 marks)

Section C

Answer any **two** *questions.*
Each question carries 10 *marks.*

24. Explain various factors affecting microbial populations in soil.
25. Explain on microbe-microbe interactions.
26. Explain on Biopesticides and their types and significance.
27. Explain nitrogen cycle.

(2 × 10 = 20 marks)

C 21305 (Pages : 3) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2022

Microbiology

MBG4C09—C-LANGUAGE, DATABASE MANAGEMENT SYSTEM AND SQL

(2018 Admissions)

Time : Three Hours Maximum : 64 Marks

Part A (Objective/ One word/ Fill in the blanks)

Answer **all** *questions.*

Each question carries ½ mark.

1. ———— data type in C language does not require memory.
2. ———— operator works on bits and perform bit-by-bit operation.
3. C+=A is equivalent to ————.
4. ———— is built in function used to terminate the program.
5. Which one of the following C commands transfer the program control to a labelled statement ?

   (a) For. (b) while.

   (c) break. (d) goto.

6. What is the value of mark[3] based on the following declaration statement int mark[5] = {80,85,90,95,99} :

   (a) 85. (b) 90.

   (c) 95. (d) 99.

7. To access any member of a structure, we use the ———— operator.

   (a) &. (b) *.

   (c) . (d) +

8. The basic object that the ER model represents is an ————.
9. ———— operation is used to combine related tuples from two relations into single tuples.
10. ———— function returns the number of tuples or values as specified in a query.

11. DML stands for ————————.

(a) Data Modification Language. (b) Data Manipulation Language.

(c) Definition Modification Language. (d) Data Manipulation Level.

12. BCNF Stands for :

(a) Boys-Codd Normal Form. (b) Boyce-Coded Normal Form.

(c) Boyce-Codd Normal Form. (d) Boyce-Codd Natural Form.

(12 × ½ = 6 marks)

Part B (Short Answer Type Questions)

Answer **all** *questions.*
Each question carries 2 *marks.*

13. What is the use of Rhombus symbol in flowchart ?

14. Write the use and syntax of conditional operator (?:).

15. Write the syntax of switch() statement.

16. How many bytes are required to store the int a[4][5]; array ?

17. What is recursive function ?

18. What is a pointer ?

19. What do you mean by defining a database ?

20. Define functional dependency.

21. Name the aggregate functions used in SQL.

22. What do you mean by embedded SQL ?

(10 × 2 = 20 marks)

Part C (Short Essay Type Questions)

Answer any **six** *questions.*
Each question carries 3 *marks.*

23. Write an algorithm to add two numbers entered by user.

24. Draw the flow chart to find the area of a rectangle.

25. Describe the logical operators in C language with example.

26. Distinguish between break and continue statements in C language.

27. Illustrate the concept of two dimensional arrays.

28. What are the categories of end users?

29. Describe the meaning of symbols used in E-R diagrams.

30. Discuss the basic structure of SQL expression.

(6 × 3 = 18 marks)

Part D (Essay Type Questions)

Answer any **two** *questions.*
Each question carries 10 *marks.*

31. Explain the looping statements in C language with example.

32. Draw the flowchart and write the program for the given number is even or not.

33. Explain first three forms of Normalization in detail.

(2 × 10 = 20 marks)

C 21304 (Pages : 3) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION APRIL 2022

Microbiology

MBG 4C 04—IMMUNOLOGY AND MEDICAL MICROBIOLOGY

(2018 Admissions)

Time : Three Hours Maximum : 64 Marks

Part A

Answer all the **twelve** *questions.*

Each question carries ½ mark.

1. ———— is a substance that enhances the immune system's response to the presence of an antigen.
2. The community immunity occurs when a large part of the population of an area is immune to a specific disease is termed as ————.
3. A measure of the amount of a substance that is needed to kill half of a test population of animals is ————.
4. The substances that are non-immunogenic but enhance the immunogenicity of any added immunogen is known as ————.
5. The disease occurring at irregular intervals or only in a few places and which is scattered or isolated are termed as ————.
6. The infections transmitted during the administration of injection and catheterisation is called ————.
7. The antibody which can cross placental barrier is ————.
8. The organism which appears in the form of grapelike cluster in microscopy is ————.
9. *Mycobacterium tuberculosis* was first identified by ————.
10. Botulism is caused by ————.

11. Typhoid is caused by ———.

12. A disease transmitted directly from person to person rather than spread generally is known as ———

(12 × ½ = 6 marks)

Part B

Answer all **ten** *questions in one* **or** *two sentences.*
Each question carries 2 *marks.*

13. Alloantigens.

14. Septicemia.

15. Congenital infection.

16. Hapten.

17. Inhalation.

18. Morphology of *Vibrio cholerae.*

19. WIDAL test.

20. Chikungunya.

21. Superficial mycoses.

22. HIV.

(10 × 2 = 20 marks)

Part C

Answer briefly any **six** *questions.*
Each question carries 3 *marks.*

23. What are the different types of immunogens ? Discuss.

24. Discuss various type of infection with examples.

25. Examine the pathogenicity of *Clostridium tetani.*

26. Inspect the infections caused by *Treponema pallidum.*

27. Outline the salient features of Rabies.

28. Differentiate between MID and MLD.

29. Write a relevant note on malarial parasite.

30. Examine the clinical implications of hepatitis.

(6 × 3 = 18 marks)

Part D

Answer any **two** *questions in details.*

Each question carries 10 *marks.*

31. Critically investigate the bacteriology involved in tuberculosis.

32. Outline various methods of transmission of infection with examples.

33. Discuss the structure of Antibody G. Classify various types of antibody G with brief overview.

(2 × 10 = 20 marks)

C 21303 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION APRIL 2022

Microbiology

MBG 4B 04—SOIL AND AGRICULTURAL MICROBIOLOGY

(2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer all the **twelve** *questions.*

Each question carries ½ mark.

1. The pioneer of microbial ecology is ————.
2. The major nutrients that can be checked by the soil fertility test are ————.
3. The organism which derives its energy from chemicals, and needs to consume other organisms for their growth is known as ————.
4. The bacteria which oxidize ammonia to nitrite is ————.
5. The symbiotic association between algae and fungi are known as ————.
6. The first free living non-symbiotic microorganism that could fix free nitrogen identified was ————.
7. The interaction between organisms of two different species in which one is inhibited or destroyed and the other is unaffected is known as ————.
8. Cyclohexane metabolism by *Mycobacterium* and *Pseudomonas* is an example of ————.
9. The fungi that are externally associated with the plant root are termed as ————.
10. Fungal wilt on tomatoes is caused by ————.
11. The simultaneous degradation of two compounds, in which the degradation of the second compound depends on the presence of the first compound is termed as ————.
12. A Gram-positive species of actinomycete that lives in symbiosis with actinorhizal plants in the genus Alnus is ————.

(12 × ½ = 6 marks)

Turn over

Part B

Answer all **ten** *questions in one* **or** *two sentences.*
Each question carries 2 *marks.*

13. Ecological cycles.
14. Fixation of atmospheric carbon.
15. Variants of nitrogen enters into nitrogen cycle.
16. Humus formation.
17. Principle of competitive exclusion.
18. Protocooperation.
19. Nematophagus fungi.
20. Rhizoplane.
21. Potato blight.
22. Nif genes.

(10 × 2 = 20 marks)

Part C

Answer briefly any **six** *questions.*
Each question carries 5 *marks.*

23. Discuss the properties of soil.
24. Describe carbon cycle.
25. Inspect various types of sulfur reduction.
26. Differentiate parasitism and predation.
27. Write a relevant note on mycorrhizae.
28. Write a note on symbiotic relationship among bioluminescent bacteria.
29. Discuss the causes and consequences of crown gall disease.
30. What are bioinsecticide bioinsectides? Discuss the applications of the same.

(6 × 5 = 30 marks)

Part D

Answer any **two** *questions in details.*
Each question carries 12 *marks.*

31. Illustrate the biogeochemical cycling of phosphorous.
32. Discuss the major types of microbial interactions between soil microorganisms with relevant examples.
33. Elaborate the need and scope of biofertilizers with relevant examples.

(2 × 12 = 24 marks)

C 21302 (Pages : 4) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2022

Microbiology

MBY 4C 16 (P)—BIOSTATISTICS (PRACTICAL)

(2014—2017 Admissions)

Time : Three Hours Maximum : 32 Marks

Part A

Answer **all** *questions.*
Each question carries ½ mark.
Fill in the blanks (Questions 1-3*)*

1. With the usual notations if $b_{xy} = -0.9$ and $b_{yx} = -0.4$, what is correlation co-efficient between X and Y ?

2. The degrees of freedom for the Chi-Square test statistic when testing for independence of two attributes in a 4 × 4 contingency table is _____.

3. If the variance due to the independent variable is 100 and the residual variance is 50, what is F ?

Choose the correct answer (Questions 4-6*)*

4. The relationship between the quantity of beers consumed (X) and blood alcohol content (Y) was studied in 16 men by using regression analysis. The following standardized regression equation was obtained from this study :

$$Y = 0.0180\,X - 0.0127$$

The above equation implies that :

(A) Each beer consumed increases blood alcohol by 1.27 %.

(B) On average it takes 1.8 beers to increase blood alcohol content by 1 %.

(C) Each beer consumed increases blood alcohol by an average of amount of 1.8 %.

(D) Each beer consumed increases blood alcohol by exactly 0.018.

5. If the sample means for each of k treatment groups were identical, what would be the observed value of the ANOVA test statistic ?

   (A) 1. (B) 0.

   (C) Value between 0 and 1. (D) Infinity.

6. Which of the following values could not represent a correlation co-efficient ?

   (A) 0.90. (B) – 1.2.

   (C) – 0.25. (D) 0.

(6 × ½ = 3 marks)

Part B (Short Answer Type Questions)

Answer **all** *questions.*
Each question carries 2 *marks.*

7. Fill in the blanks of following ANOVA table :

Sources of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F-Statistic
Between Samples	—	2	—	—
Within Samples	26	—	2.17	
Total	36	14		

8. The co-efficient of rank correlation of the marks obtained by 10 students in two particular subjects was found to be 0.2. It was then detected that the difference of ranks in the two subjects obtained by one of the students was wrongly taken to be 9 in place of 7. What should be the correct coefficient of rank correlation ?

9. The lines of regression of a bivariate population are :

   $2Y - X - 50 = 0$
   $3Y - 2X - 10 = 0.$

   Find the mean values of X and Y.

10. If $r_{12} = 0.6, r_{13} = r_{23} = 0.8$ compute $r_{23.1}$.

11. Compute $R_{1.23}$ for the correlation co-efficients given in Question no. 10.

(5 × 2 = 10)

Part C (Short Essays)

Answer any **three** *questions.*
Each question carries 3 *marks.*

12. In a cross-breeding with plants at certain spices 240 offsprings were classified into four classes with respect to the structure of their leaves :

Class	I	II	III	IV	Total
Frequency	21	127	40	52	240

According the theory of heredity, the probabilities of the four classes should be in the ratio 1 : 9 : 3 : 3. Are these data consistent with the theory ?

13. From a sample of 18 pairs of observations the correlation is 0.5 and the corresponding population correlation co-efficient is 0.7. Is the difference significant ?

14. You are given the following data :

	X	Y
Mean	36	85
Standard Deviation	11	8

Karl Pearson correlation between X and Y is 0.66.

(i) Find the two regression lines ; and

(ii) Estimate the value of X when Y = 75.

15. Out of 8000 graduates in a town 800 are females; out of 1600 graduate employees 120 are females. Determine whether any distinction is made in the appointment on the basis of sex.

(3 × 3 = 9 marks)

Part D (Essay)

Answer any **one** *question.*
Each question carries 10 *marks.*

16. (i) Find Karl Pearson correlation co-efficient between sales (in thousand units) and expenses (in thousand rupees) of the following ten firms :

Firm	1	2	3	4	5	6	7	8	9	10
Sale	50	50	55	60	65	65	65	60	60	50
Expenses	11	13	14	16	16	15	15	14	13	13

(ii) The ranks of the same 15 students in two subjects A and B are given below. The two numbers within the brackets are the ranks of same students in A and B respectively.

(1, 10), (2, 7), (3, 2), (4, 6), (5, 4), (6, 8), (7, 3), (8, 1), (9, 11), (10, 15), (11, 9), (12, 5), (13,14), (14, 12), (15,13).

Find Spearman rank correlation co-efficient.

17. The following table gives the number of units of production per day turned out by four different types of machines :

Employee	Machine			
	A	B	C	D
I	40	36	45	30
II	38	42	50	41
III	36	30	48	35
IV	46	47	52	44

Perform a two-way ANOVA on the data given above.

(1 × 10 = 10 marks)

C 21301 (Pages : 4) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2022

Microbiology

MBY 4C 15—BIOSTATISTICS—II

(2014—2017 Admissions)

Time : Three Hours Maximum : 64 Marks

Use of Calculator is permitted.

Part A

Answer **all** *questions.*
Each question carries ½ mark.

Fill in the blanks (Questions 1-4) :

1. Probability of type I error is called ————————.
2. Test procedure used to compare several population mean ————————.
3. The two regression lines for the variables X and Y intersect at the point ————————.
4. In case of three variables X_1, X_2, X_3 the multiple correlation coefficient $R_{1.23}$ in terms of simple correlation co-efficient is equal to ————————.

Choose the correct answer (Questions 5-8) :

5. If the two lines of regression coincides, the co-efficient of correlation can be ————————.

   (a) 0. (b) – 1.

   (c) + 1. (d) Both (b) and (c).

6. The range of χ^2 variate is :

   (a) – 1 to 0. (b) 0 to ∞.

   (c) 0 to 1. (d) – 1 to + 1.

7. Degrees of freedom of Chi-square in case of contingency table of order (4 × 3) are :

   (a) 12. (b) 9.

   (c) 8. (d) 6.

8. The ———— sum of squares measures the variability of the observed values around their respective treatment means.

(a) Treatment. (b) Error.

(c) Total. (d) Interaction.

State True *or* False (Questions 9-12) :

9. Type II error occurs, when we reject the null hypothesis which is true.
10. The error deviations within the SSE statistic measure distances within groups.
11. $r_{xy} = 0$ this implies X and Y are independent.
12. If $R_{1.23} = 0$, all regression residuals are zero.

(12 × ½ = 6 marks)

Part B (Short Answer Type Questions)

Answer **all** *questions.*
Each question carries 2 *marks.*

13. Define simple and composite hypothesis.
14. What are the conditions for the validity of χ^2 -test ?
15. Explain one-way ANOVA model.
16. State the properties of regression coefficients.
17. Write the formula for partial correlation coefficient $r_{12.34}$ case of four variables.
18. What is a contingency table ? Give the χ^2 statistic for a 2 × 2 contingency table.
19. Define two types of errors in testing of hypotheses.
20. Define Spearman's rank correlation.
21. State the basic assumptions of linear regression model.
22. Define confidence interval and confidence co-efficient.

(10 × 2 = 20 marks)

Part C (Short Essays)

Answer any **six** *questions.*
Each question carries 3 *marks.*

23. Discuss power of test and level of significance.
24. Describe the procedure of testing the significance of regression coefficient.

25. If the line of regression Y on X is Y = 2X+1 and of X on Y is 6X = Y – 3, then find correlation between X and Y; also find mean values of X and Y.

26. Explain Chi-square test of goodness of fit.

27. Elucidate the concept of multiple correlation. State the properties of multiple correlation coefficient.

28. Consider three variables X_1, X_2 and X_3 ; following correlation coefficients were obtained $r_{12} = 0.77$, $r_{13} = 0.72$ and $r_{23} = 0.52$. Find partial correlation coefficient $r_{12.3}$ and multiple correlation coefficient $R_{1.23}$.

29. Briefly explain the steps in solving testing of hypothesis problem.

30. A random sample of 625 pairs of observations gives a correlation coefficient of 0.2. Test the significance of r.

(6 × 3 = 18 marks)

Part D (Essays)

Answer any **two** *questions.*
Each question carries 10 *marks.*

31. (i) Use χ^2 test to determine if any distinction is made in employment on the basis of sex. χ^2 value at 5% level for 1 df is 3.84 :

	Employed	Not employed
Male	1480	5720
Female	120	680

(ii) Consider the following paired observations. Find correlation and comment on independence of X and Y :

X	– 3	– 2	– 1	0	1	2	3
Y	9	4	1	0	1	4	9

32. (i) Explain the analysis of variance technique for two way classified data with one observation per cell.

(ii) Define power of test. Explain the role of critical region in testing of hypothesis.

33. (i) Complete the following one-way ANOVA table :

Source	df	SS	MS	F
Between groups	—	—	196.60	—
Error	16	103.2	—	
Total	19	—		

(ii) The ratio of offsprings in four classes in an experiment was expected to be 1:3:3:9. the experiment yielded data as follows :

Classes	AA	Aa	aA	aa
No. of offsprings	8	29	37	102

Test whether the given data is in agreement with the hypothetical ratio.

(2 × 10 = 20 marks)

C 21300 (Pages : 3) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2022

Microbiology

MBY 4C 07—MEDICAL MICROBIOLOGY AND IMMUNOLOGY

(2014—2017 Admissions)

Time : Three Hours Maximum : 64 Marks

Section A

Answer **all** *question.*

Each question carries ½ mark.

1. Physician induced infection resulting from investigative, therapeutic or other procedures are called ————————.
2. Serologic test used to diagnose enteric fever is ————————.
3. The dermatophyte causing hair perforation is :

   (Trichophyton mentagrophytes, Trichophyton rubrum, Microsporum audonii, Microsporum canis)
4. Name the vector transmitting malaria.
5. The congenital infection leading to malformations in developing foetus is called ———————— infection.
6. The T_H cells recognize antigens presented on ———————— cells.

   (APCs, Tc cells, NK cells, Ts cells)
7. The heavy chain present in human sIgA is ————————.

   (γ-chain, α-chain, μ-chain, ε-chain)
8. The human immunoglobulin crossing the placental barrier is :

   (IgG, IgA, IgM, IgE)
9. Give one example for passive agglutination test.
10. 'Pigeon fancier's lung' is a clinical condition developed due to ———————— hypersensitivity.

    (Type I, Type II, Type III, Type IV)

11. Pernicious anaemia is caused due to the production of autoantibodies against ————————.

12. The process of transformation of cyst to trophozoite in human alimentary canal is called ————————.

(12 × ½ = 6 marks)

Section B

Write briefly on **all** *questions.*
Each question carries 2 *marks.*

13. Differentiate secondary infection and recurrent infection.

14. Lowenstein-Jensen's medium.

15. Negri bodies.

16. 'Window period' of HIV infection.

17. Haematopoiesis.

18. NK cells.

19. Thymus dependant antigens.

20. Affinity and Avidity of antigen - antibody interaction.

21. Rheumatoid factor.

22. Grave's disease.

(10 × 2 = 20 marks)

Section C

Write short essays on any of **six** *questions.*
Each question carries 3 *marks.*

23. Sources of infection.

24. Tetanus.

25. Pathogenesis of rabies.

26. Amoebic dysentery.

27. Mechanisms of innate immunity.

28. Production and applications of monoclonal antibodies.

29. Immunodiffusion tests.

30. Mechanisms of autoimmunity.

(6 × 3 = 18 marks)

Section D

Write essays on any **two** *questions.*
Each question carries 10 *marks.*

31. Write a note on Type I hypersensitivity reactions.

32. Write a note on cells of immune system.

33. Discuss the etiology, pathogenesis and laboratory diagnosis of cholera.

(2 × 10 = 20 marks)

C 21299 (Pages : 3) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2022

Microbiology

MBY 4B 06—SOIL AND AGRICULTURAL MICROBIOLOGY

(2014—2017 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer **all** *questions.*
Each carries ½ mark.

Fill in the blanks :

1. ———— protects nitrogenase from oxygen in root nodules of leguminous plants.
2. The outermost layer of earth that is composed of soil is known as ————.
3. *Xanthomonas oryzae* causes ———— disease of rice.
4. Plant root surface is known as ————.
5. The process of oxidation of ammonia to nitrite and then to nitrate by soil microorganisms is known as ————.
6. ———— is the cyanobacteria associated symbiotically with aquatic fern azolla.
7. ———— is the nutritional form of nitrogen that is assimilated by plants from soil.
8. Banana bunchy top is a ———— disease of plants.
9. ———— is the cofactor of nitrogenase enzyme.
10. The term dark organic matter formed in the soil when plant and animal matter decays is called-- ————.
11. Citrus canker of plants is a ———— disease.
12. The symbiotic association between fungi and algae is known as ————.

(12 × ½ = 6 marks)

Part B

Answer **all** *questions.*
Each carries 2 *marks.*

Comment on the following :

13. Wilt of tomato.
14. *Thiobacillus thioxidans.*
15. Bacteroids.
16. Azospirillum.
17. Crown gall disease of plants.
18. Biopesticides.
19. Nematophagus fungi.
20. Mutualism.
21. Tomato yellow leaf curl.
22. Actinorhizae.

(10 × 2 = 20 marks)

Part C

Answer any **six** *questions.*
Each carries 5 *marks.*

Write briefly :

23. Mycorrhiza.
24. Sulfur cycle.
25. Rhizosphere effect.
26. Rhizobium as biofertilizer.
27. Carbon cycle.
28. Azolla as biofertilizer.
29. Fungal diseases of plants.
30. Nitrogenase enzyme.

(6 × 5 = 30 marks)

Part D

Answer any **two** *questions.*
Each carries 12 *marks.*

31. Explain microbial transformations of nitrogen and phosphorus with the micro-organisms involved.

32. Discuss about various microbe-microbe interactions.

33. Comment on soil microflora. Explain the factors affecting the distribution of soil micro-organisms.

(2 × 12 = 24 marks)