

2016

MICROBIOLOGY

[Honours]

PAPER – I

Full Marks : 90

Time : 4 hours

*The figures in the right hand margin indicate marks
Candidates are required to give their answers in their
own words as far as practicable*

Illustrate the answers wherever necessary

[NEW SYLLABUS]

GROUP – A

Answer any two questions : 15 x 2

1. (a) Discuss the contributions made by the following scientists.

(i) Winogradsky (ii) Paul Ehrlich.

(Turn Over)

(b) Name the microorganism associated with the following :

- (i) Nitrifying bacteria
- (ii) Denitrifying bacteria
- (iii) Ethanol production
- (iv) Milk spoilage
- (v) Citric acid production.

(c) Define bioremediation and bioleaching with example. $(3 + 3) + (1 \times 5) + (2 + 2)$

2. (a) Diagrammatically represent the stages of endospore formation.

(b) Write the general characters of Actinomycetes and Rickettsia.

(c) Differentiate between the following :

(i) Selective medium and enriched medium

(ii) Eubacterial and archaeobacterial membranes. $4 + (3 + 3) + (2 \frac{1}{2} \times 2)$

3. (a) Differentiate between pinnate and centric diatoms. What is diatomaceous earth ?
- (b) Write a short note on parasexual mechanism in fungi. Name one microscopic and one macroscopic edible fungus.
- (c) Write a short note on classification as proposed by Carl Woese. (4 + 2) + (4 + 2) + 3
4. (a) On what factors does the length of the lag phase in a growth curve depends.
- (b) Name one symbiotic and one non-symbiotic N_2 -fixing bacteria.
- (c) Differentiate between SEM and TEM.
- (d) Write down the principle of Gram staining. (3 + 3) + 2 + 3 + 4

GROUP -B

Answer any five questions : 8 × 5

5. (a) Draw and describe the structure of a T-even phage.
- (b) What are viroids ? Name one disease caused by viroids. 5 + (2 + 1)

6. (a) Describe in brief the ultrastructure of bacterial flagella.
- (b) What is continuous culture ? Differentiate chemostat and turbidostat. $4 + (1 + 3)$
7. (a) Define phenol coefficient.
- (b) What is lyophilization ?
- (c) Write down mode of action of depth filters and membrane filters. $2 + 2 + 4$
8. (a) Classify protozoa according to Levine et al and mention the class characters.
- (b) What do you mean by selective toxicity ? $7 + 1$
9. (a) What do you mean by diauxic growth ?
- (b) Discuss the molecular basis of motility. $3 + 5$
10. What is prion ? Write short note on Mycoplasmas. How would you grow bacteria in anaerobic condition ? $2 + 3 + 3$

11. Write short notes on :

2 x 4

- (i) Generation time
- (ii) Teichoic acid
- (iii) Chlorobium vesicle
- (iv) Capsule.

12. (a) Describe the fruit body of *Agaricus* with suitable diagram.

(b) Differentiate bacterial and archaeal cell wall.

5 + 3

GROUP -C

Answer any five questions :

4 x 5

13. Write a note on fungal cell wall composition.

4

14. Write down the disadvantages of pour plate technique. How does penicillin inhibit the murein biosynthesis ?

2 + 2

15. Define the following : 1 × 4

(a) MIC,

(b) MBC,

(c) Sanitizer,

(d) Germicide.

16. Define prosthecae. Write down the mode of action of sterilizing gases. 2 + 2

17. (a) What is agar ? Mention its source.

(b) What is shadow casting ? 2 + 2

18. Name diseases caused by the following organisms : 4 × 1

(a) *Entamoeba*

(b) *Mycoplasma*

(c) *Plasmodium*

(d) *Chlamydia*.

19. Write in brief Koch's postulates, Name the microorganism on which he performed the experiment to demonstrate his postulates. 3 + 1
20. (a) What do you mean by enriched media ?
- (b) What is 'budding yeast' ? 2 + 2
-