

Code No. : 5911

Sub. Code : WMBM 11

M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2024.

First Semester

Microbiology — Core

GENERAL MICROBIOLOGY AND MICROBIAL DIVERSITY

(For those who joined in July 2023 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (15 × 1 = 15 marks)

Answer ALL questions.

Choose the correct answer:

1. Resolving power of a microscope is a function of
 - (a) Wavelength of light used
 - (b) Numerical aperture of lens system
 - (c) Refractive index
 - (d) Wavelength of light used and numerical aperture of lens system

2. Oil immersion objective lens has an NA value of _____
 - (a) 0.65
 - (b) 0.85
 - (c) 1.33
 - (d) 1.00
3. In fluorescence microscopy, which of the following performs the function of "removing all light except the blue light"?
 - (a) Exciter filter
 - (b) Barrier filter
 - (c) Dichroic mirror
 - (d) Mercury arc lamp
4. Choose the method concerned with anaerobic bacteria cultivation.
 - (a) Candle jar method
 - (b) Anaerobic jar method
 - (c) Anaerobic chamber
 - (d) All the above
5. Advantage(s) of Automated Microbial Identification System.
 - (a) Reduce human errors & Improve turn around time
 - (b) Human safety & Run More tests
 - (c) Increased Productivity & Operate with less instruments
 - (d) All the above

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6. The dye eosinate of methylene blue belongs to which group?
 - (a) Acidic dye
 - (b) Basic dye
 - (c) Neutral dye
 - (d) Oxantne dye
7. Which among the following is a pathogenic algae for humans?
 - (a) Prototheca
 - (b) Chlorella
 - (c) Cephaleuros
 - (d) Acanthopeltis
8. Regarding Ectocarpus sp, Choose the FALSE statement(s)
 - (a) Green algae
 - (b) It could be cultivated in artificial sea water
 - (c) It is a model organism.
 - (d) It is a shelter for several marine invertebrates
9. Select algal culture from the following.
 - (a) Auxenic culture
 - (b) Clonal culture
 - (c) Unialgalculture
 - (d) All the above

10. Which of the following is the best definition of generation time in a bacterium?
 - (a) The length of time it takes to reach the log phase
 - (b) The length of time it takes for a population of cells to double
 - (c) The time it takes to reach stationary phase
 - (d) The length of time of the exponential phase
11. Which of the following amino acids require sulphur for their synthesis?
 - (a) Tryptophan
 - (b) Methionine
 - (c) Cystine
 - (d) Methionine and cysteine
12. Which one of the following is / are the application of actinomycetes?
 - (a) They produce a compound called geosmin. that gives the earthy colour to the soil.
 - (b) They can degrade complex molecules such as cellulose and chitin.
 - (c) The genus Frankia is a diazotroph that is capable of biological nitrogen fixation.
 - (d) All the above

13. Which one of the following is a barophiles ?
- Thermusaquaticus
 - Thiomargaritarnagnifica 1
 - Pyrolobussp
 - Moritellasp
14. Which of the following features differs archaeobacteria from eubacteria?
- Cell shape
 - Mode of nutrition
 - Mode of reproduction
 - Cell membrane structure
15. Which of the following enzyme(s) is / are produced by alkalophiles.
- Cellulases
 - Lipases
 - Xylanases
 - All the above

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PART B — (5 × 4 = 20 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

16. (a) Explain bright field microscopy.
- Or
- (b) Describe the applications of phase contrast microscopy.
17. (a) Write down the features of autoclave.
- Or
- (b) Sketch about the national level culture collection centres.
18. (a) Examine the media used for culturing algae.
- Or
- (b) Outline the importance of *Nostoc*-cyanobacteria.
19. (a) Quote the economic importance of fungi.
- Or
- (b) What do you know about growth curve?
20. (a) Assess the properties of alkalophiles.
- Or
- (b) Report the feature of methanogens.

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PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

21. (a) Illustrate the principle and applications of SEM with neat sketch.
- Or
- (b) Discuss in detail about Micrometry with neat sketches.
22. (a) Assess the principle, methodology and possible results of Gram's staining with neat diagrams.
- Or
- (b) How do we cultivate anaerobes? Explain in detail.
23. (a) Classify algae in detail.
- Or
- (b) Evaluate diverse types of spores produced by algae along with their significance.
24. (a) Explain in detail about the classification of fungi.
- Or
- (b) Describe in detail about microbial growth kinetics.
25. (a) Write down the strategies followed by microbes to manage different stress.
- Or
- (b) Sketch the general characters of halophiles along with their applications.

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