

2020

**MICROBIOLOGY — HONOURS**

**Paper : SEC-A-1**

**(Microbial Quality Control in Food and Pharmaceutical Industries)**

**Full Marks : 80**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

Answer **question no. 1 & 2** and **any four** questions from the rest.

1. Answer **any ten** questions : 2×10
- (a) What is meant by biosafety level (BSL)?
  - (b) What is MPN?
  - (c) How hazardous effect of biowastes can be neutralized?
  - (d) What is the difference between sterilization and disinfection?
  - (e) Will coliforms grow on XLD agar medium? Give reasons for your answer.
  - (f) What is grading of milk?
  - (g) What medium is used for isolation of *salmonella* sp. in food samples and why?
  - (h) Why bile salt is used in McConky agar?
  - (i) What is the purpose of using Eosin and methylene blue in EMB agar?
  - (j) Which types of microorganisms grow best in Sabouraud agar?
  - (k) What is meant by 'Infectious dose' of a pathogen? Cite an example.
  - (l) Name two essential chemical components required for performing PCR in laboratory.
  - (m) What is BOD? How it is related with pollution level in water?
  - (n) What is HEPA filter? Why it is used?
  - (o) Name one biochemical and one immunological test for determining presence of microbes in pharmaceutical samples.
  - (p) Why 70% ethanol is preferably used for disinfection purpose?
2. Write short notes on **any four** of the following : 5×4
- (a) Dye reduction test
  - (b) Application of nucleic acid probes in food microbiology

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- (c) Principle of autoclaving
  - (d) Limulus lysate test for endotoxin.
  - (e) Detection of coliforms in water
  - (f) Enrichment culture technique.
3. (a) What is incineration? Where is it used and why? What precautions should be taken during incineration?
- (b) How osmolarity of the surrounding medium affects the cell?
- (c) What is Tyndallization? (1+2+2)+3+2
4. (a) Describe one method for the quantitative examination of milk.
- (b) What is COB test of milk? How is it performed?
- (c) Write down the principle of Resazurin assay. 4+(1+2)+3
5. (a) What are the common requirements in a BSL-3 laboratory?
- (b) A specialized research laboratory deals with highly dangerous and deadly microorganisms. – Which type of BSL laboratory is required and why?
- (c) Which factors determine the BSL laboratory levels?
- (d) What is PPE? 3+(1+2)+2+2
6. (a) How the biological response of the biosensor is determined?
- (b) What is the basic principle behind the home blood glucose sensor?
- (c) “Immunosensor combines both ELISA and biosensor.” – Explain.
- (d) How sterility of pharmaceutical products are tested? 2+2+3+3
7. (a) What does HACCP stand for and why is it used?
- (b) What are the limitations of HACCP?
- (c) “A prerequisite and preliminary set-up is necessary before HACCP can be put into place.” – Justify.
- (d) Why determination of critical control point is important in HACCP? (1+2)+2+3+2
8. Distinguish between the following : 2½×4
- (a) Selective media and Differential media
  - (b) ISI and BIS
  - (c) Total count and Viable count of microorganisms in a sample.
  - (d) Cationic and anionic detergents as germicidal agents.
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