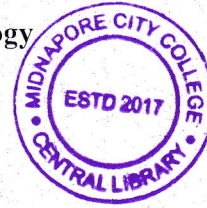


The West Bengal University of Health Sciences
B.Sc. in Medical Microbiology 2nd Semester September, 2023
Examination

Subject : Microbial Physiology



Time : 2 hrs.

Full Marks : 50

Attempt *all* questions

1. Attempt all the questions : 10 x 1
- a) An example of basal media is :
 - i) Nutrient agar.
 - ii) MRS agar.
 - iii) EMB agar.
 - iv) MacConkey agar.
 - b) Secondary metabolites produced in which phase of the bacterial growth cycle :
 - i) Long term stationary phase.
 - ii) Death phase.
 - iii) Lag phase.
 - iv) Stationary phase.
 - c) What is the general mode of bacterial cell division?
 - i) Budding.
 - ii) Fragmentation.
 - iii) Binary division.
 - iv) Conjugation.
 - d) An example of protein that is not involved chemotaxis :
 - i) MCP.
 - ii) CheW.
 - iii) FtsZ.
 - iv) CheR.
 - e) A chemical modification involved flagellar rotation :
 - i) Glycosylation.
 - ii) Myristoylation.
 - iii) Ribosylation.
 - iv) Methylation.
 - f) Give an example of chemical specifically utilized for the culture of anaerobic bacteria :
 - i) Peptone.
 - ii) Bile salt.
 - iii) Methylene blue.
 - iv) Thioglycollate.
 - g) Name the protein responsible for initiation of sporulation :
 - i) Spo0A.
 - ii) SpoF.
 - iii) σ^G .
 - iv) KinA.
 - h) What is the synonym of response regulator?
 - i) Ligand.
 - ii) Cell surface receptor.
 - iii) Antagonist.
 - iv) Second messenger.
 - i) An example of compatible solute is :
 - i) NiCl_2 .
 - ii) ZnSO_4 .
 - iii) TiO_2 .
 - iv) KCl.
 - j) Rubrerythrin and rubredoxin oxidoreductase are involved in :
 - i) Hydrogenation of OH.
 - ii) Oxidation of O_2^- .
 - iii) Reduction of ONOO^- .
 - iv) Reduction of H_2O_2 .
2. Answer *any four* of the following questions : 4 x 2
- a) How enrichment media is differing from the selective media?
 - b) What is the significance of exponential phase?
 - c) What is the significance of quorum sensing?
 - d) What is the fenton reaction?
 - e) What is the function of flow cytometer?
 - f) State the role of superoxide dismutase.
3. Answer *any four* of the following questions. 4 x 4
- a) Cellular mechanism of bioluminescence in *Vibrio fischeri*.
 - b) Methods of culturing anaerobic bacteria.
 - c) Role of divisome in cell division.
 - d) Bacterial peptidoglycan synthesis
 - e) Mechanisms of *Helicobacter pylori* survival in stomach
 - f) Molecular mechanisms behind the high osmolarity maintenance by *Escherichia coli*.
4. Answer *any two* of the following questions :
- a) A bacterial culture initially maintain at 30°C , later it kept in 40°C -what are the different changes observed at molecular level? How cellular metabolism is related to pH and temperature? 5+3
 - b) An egg sandwich got contaminated with 10 cells of a bacterium. It was left open at 37°C for 4 hours. It was found to contain 40960 cells. What is the generation time of the bacterium? What is the significance of long-term stationary phase? 5+3
 - c) Depicted a suitable diagram of growth cycle and state the significance of each step. How various enzymes protects bacteria from oxidative stress? 5+3