AT–342

B.Sc. Part—II (Semester—III) Examination

3S : INDUSTRIAL MICROBIOLOGY

(Industrial Fermentation, Metabolism and Bioinstrumentation)

Time : Three Hours] [Maximum Marks : 80

Note :— (1) **ALL** questions are compulsory.

(2) Draw well labelled diagrams wherever necessary.

1. (A) Fill in the blanks :

(i) Chemically, enzymes are _____ in nature.

(ii) Hops are used as fermentation medium components in production of _____.

(iii) In batch fermentation, autotitrator is used for control of _____.

(iv) _____ invented the process of Pasteurization. 2

(B) Choose the correct alternative :

(i) Raw materials used for the production of alcohol is _____.

(a) Molasses

(b) Starch

(c) Sulphite waste water

(d) All of these

(ii) Industrial microbiology, mainly depends on the phenomenon _____.

(a) Vaccination

(b) Pasteurization

(c) Fermentation

(d) Both (a) and (c)

(iii) BCG vaccine is a type of _____.

(a) Killed vaccine

(b) Live attenuated vaccine

(c) Recombinant vaccine

(d) All of the above

(iv) Genetic Engineering vaccine is used for _____.

(a) Polio

(b) Small pox

(c) Rabies

(d) Hepatitis-B 2

(C) Answer the following in one sentence :

(i) Define wine.

(ii) Spectroscopy.

(iii) Single cell protein

(iv) Apoenzyme. 4

2. (a) Define the terms :

(i) Enzyme

(ii) Active site

(iii) Apoenzyme

(iv) Isoenzyme. 4

(b) Give the diagramatic sketch of ETC. 4

(c) Describe in brief lock and key model to know mechanism of enzyme action. 4

OR

(d) Define the terms :

(i) Substrate

(ii) Prosthetic group

(iii) Immobilized enzymes

(iv) Co-enzyme. 4

(e) What is metabolism ? Give the four functions of metabolism. 4

(f) Write down the sequence of ten enzyme catalysed reactions involved in EMP pathway. 4

3. Describe in brief industrial production of biomass production :

(a) Bacterial Biomass 4

(b) Fungal Biomass 4

(c) Yeast Biomass. 4

OR

Describe in brief industrial production of :

(d) Bacterial Biofertilizer. 4

(e) Fungal Insecticide. 4

(f) Mycorrhizal biofertilizer. 4

4. What do you mean by antibiotic ? Describe in detail industrial production of antibiotic pencillin. 12

OR

What is an enzyme ? Describe the manufacturing process of fungal amylase in detail. 12

5. (a) What is formulation ? Explain in brief. 4

(b) Discuss in brief chromatography and its role in purification of fermented product. 4

(c) Explain liquid-liquid extraction and distillation to get concentrated finished product by fermentation. 4

OR

(d) What is pretreatment ? How is it carried out by flocculation ? 4

(e) Briefly give the role of filtration and sedimentation in the process of solid liquid separation. 4

(f) Define the terms related to downstream processing :

(i) Formulation

(ii) Purification

(iii) Concentration

(iv) Distillation. 4

6. What do you mean by live vaccine ? Describe in detail the process of industrial production of BCG vaccine. 12

OR

Name the person who discovered first antibiotic-penicillin and describe the entire process of pencillin production at pharmaceutical industry. 12

7. Describe in brief the following :

(a) Working and application of colourimeter. 4

(b) Components and application of paper chromatography. 4

(c) Role of radioactive isotopes in microbiology. 4

OR

(d) Working and application of gel electrophoresis. 4

(e) Beer Lambert's Law and its application. 4

(f) Working and application of UV visible spectrophotometer. 4