microbiology 27/11/

N.B. All questions are compulsory

Numbers to the right indicate marks

Draw neat labeled diagram wherever necessary

Duration: 3 hours **Total marks: 100**

Q.1 A Answer the following (ANY TWO) **12**

(i) Schematically represent a typical fermentation process and explain in brief the component parts of a fermentation process.

(ii) Explain any three techniques used to isolate auxotrophic mutants producing improved yields of primary metabolites.

(iii) What are the key criteria of OECD guidelines for quality control of preserved stock cultures?

(iv) Justify: A mutation to auxotrophy for the primary end product may increase the production of the secondary metabolite.

Q.1 B Answer the following (ANY EIGHT) **8**

(i) State two commercially important enzymes produced by microorganims.

(ii) Write true or false- Secondary metabolites are produced during the idiophase.

(iii) Give one example of single cell protein.

(iv) Give the full form of FDA.

(v) Name one cryoprotective agent used in cryopreservation of cultures.

(vi) What is Cooperative feedback control ?

(vii) State any one application of Gradient plate technique.

(viii) Give the full form of MCB.

(ix) Name one method of primary screening of microorganims.

(x) Write true or false- Microbial cultures grown on agar slopes can stored in a refrigerator (5° C) or freezer (–20°C) for 6 months.

(xi) Biotin ___________ causes an increase in membrane tension resulting in the opening of the mechanosensitive channel, which allows the export of glutamate. (deficiency, abundance, absence)

(xii) Define auxotrophs.

Q.2 A Answer the following (ANY TWO) **12**

(i) Give a detailed account of the various carbon sources used in industrial media formulation.

(ii) With the help of examples discuss the role of inhibitors and precursors in fermentation media

(iii) Write a short on Sterilization of inustrial media.

(iv) Elaborate on the different mechanisms for the separation of suspended soilds using filter sterilization.

Q.2 B Answer the following (ANY EIGHT) **8**

(i) What are scale up fermentations?

(ii) Give any two examples of inducers used in media formulation.

(iii) Define biomass.

(iv) Give any two examples of commonly used nitrogen sources in industrial media

(v) Give an examples of media components which also play a role in buffering of the medium

(vi) Define aseptic operation.

(vii) Give the full form of PTFE ,

(viii) State the equation of DEL factor.

(ix) Name the sporulating organism used as an indicator in the heat sterilization process.

(x) What is batch sterilization ?

(xi) Give any two examples of secondary metabolites.

(xii) Define - inoculum.

Q.3 A Answer the following (ANY TWO) 12

(i) Elaborate on basic function of a fermenter for microbial or animal cell culture.

(ii) With the help of neat diagram, explain different types of agitators used in designing of fermenter.

(iii) Give detailed account on different types of aeration system in fermenter.

(iv) With the help of neat and labeled diagram, explain Airlift fermenter.

Q.3 B Answer the following (ANY EIGHT) 8

(i) Define - Online sensor.

(ii) State one disadvantage of stirred fermenter.

(iii) What are thermistors?

(iv) What is the function of baffles?

(v) Name two antifoaming agents.

(vi) Give one example of sensor which penetrate into the interior of the fermenter.

(vii) Name one instrument used for pressure measurement during fermentation.

(viii) State the disadvantage of mercury in glass thermometer.

(ix) Name two types of valves used in designing of fermenter.

(x) State one method for termperature control during fermentation process.

(xi) Name two types of construction material used for designing of fermenter.

(xii) Give one example of sensor which do not come in contact with the fermenter.

Q.4 A Answer the following (ANY TWO) 12

(i) Give detailed account on vinegar production using submerged fermentation.

(ii) Write a note on raw materials used in beer production.

(iii) With the help of flow sheet, explain red wine production.

(iv) Discuss in brief brewing process.

Q.4 B Answer the following (ANY EIGHT) 8

(i) Define- Malt.

(ii) What are adjuncts?

(iii) Name the yeast strain used for lager beer production.

(iv) What is balling degree?

(v) Why is secondary fermentation essential in beer production?

(vi) Name any two varieties of grapes used for production of wine.

(vii) _______ acid is usually found in diseased wine.(Formic acid/Malic acid).

(viii) How is starter culture prepared during wine production?

(ix) Define- Must.

(x) Vinegar should contain atleast _________ percentage of acetic acid.(10/4/20)

(xi) _________ and _________ are volatile acids found in wine.(Acetic acid,propionic acid/malic acid,tartaric acid)

(xii) Define - sherry.

Q.5 Answer the following (ANY FOUR) 20

(i) Explain in brief the secondary screening method for antibiotic producers.

(ii) Discuss the importance of preservation of industrially important cultures and explain any two methods of culture preservation.

(iii) Write a short note on conseridations essential for medium formulation.

(iv) Write a short note on Deep jet fermenter.

(v) Discuss in brief Foam sensing and control during fermentation process.

(vi) Write a short note on types of vinegar.

****