(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID : 154513 Roll No. | | | | | | | | | | |

B.Tech.

(SEM. V) THEORY EXAMINATION 2015-16

BIOPROCESS ENGINEERING-I

[Time:3 hours] **[MaximumMarks:100]**

SECTION-A

Note : Attempt all parts. All parts carry equal marks. Write answer of each part in short. (2×10=20)

Q1. (A) Indicate True **(T)** or False **(F)** :

(a) Wattmeter is a device for measurement of agitatior power. ( )

(b) Penicillin production is an anaerobic process. ( )

(c) Acetic acid production from sugary raw material involves two stage fermentation. ( )

(d) Ethanol production is an aerobic fermentation. ( )

(e) Distillation is used to separate the liquids that have different boiling points. ( )

(B) Fill in the gap with one suitable word:

(f) All the ..... required for the ..... is stored in DNA.

(g) In microbiology lab, agar-agar is used as a.....

(h) Residence time in CSTR is a function of.....

(i) Supply of oxygen to bioreactor depends on ..... of oxygen by the .....

(j) In sterilization $\left(\frac{NE}{NO}\right)$ is known as ..... of.....

SECTION-B

Note: Attempt any <u>five</u> questions from this section.

(10×5=50)

Q2. Discuss the importance of the Del factor (∇)

Q3. Give a brief account of air sterilization in a bioprocess.

Q4. Explain the 'yield coefficients" terms used in bio process.

Q5. How do you express growth of the micro organisms in a batch culture system?

Q6. Enumerate the steps involved in an industrial bio process.

Q7. Give a brief mention of demand and supply of oxygen in an industrial bioprocess.

Q8. Discuss the classification of product formation in bioporcess(fermentation) due to consumption of sulotrate.

Q9. How do you explain the environmental control of a bioreactor?

SECTION-C

Note: Attempt any <u>two</u> questions from this section.

(15×2=30)

Q10. Develop temperature -time profile of batch sterilization of media using steam sparging as a heat source as given below:

$$T = To(1+\frac{\alpha\theta}{1+\nu\theta}$$

Q11. Discuss the various resistences that are possible in a gas-sparged bioprocess.

Q12. 100 Kg per hour of a liquid containing 12% total solid is concentrated to produce a liquid containing 32% total solid. Calculate the quantity of water removed per hour.

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