



FACULTY OF SCIENCE

DEPARTMENT OF BIOTECHNOLOGY **B-Tech: BIOTECHNOLOGY**

MODULE BTN1Y14
CAMPUS INDUSTRIAL BIOTECHNOLOGY IV
 DFC

NOVEMBER EXAMINATION

DATE: 08.11.2014

SESSION: 12:30-14:30

ASSESSOR(S)

MS V KESHAV

EXTERNAL MODERATOR

DR PETER STEGMANN

DURATION **2 HOURS**

MARKS **120**

NUMBER OF PAGES: 4 PAGES

REQUIREMENTS: 2 ANSWER SCRIPTS PER STUDENT

QUESTION 1**[25]**

1. Producing enzymes industrially (large scale production) is quite an expensive procedure, name an alternative source (1) and state why is it the preferred alternative (9)
2. Name the purpose of labeling a product (7)
3. Draw and label four different immobilization systems used to immobilize enzymes. (8)

QUESTION 2**[65]**

4. Write the substrate used and product(s) formed to prepare beer. (2)
5. Name the molecular compound and ingredient used in beer that is known to prevent Osteoporosis. (2)
6. Brewing water is used for: (5)
Brewing & process dilution → 6.1
Cleaning & CIP → 6.2
Bottle washing & past → 6.3
General cleaning e.g. floors → 6.4
Boiler feed water → 6.5
7. Write the basic qualities of barley used to assess seeds prior to malting (14)
8. Explain this reaction: $3\text{Ca}^{2+} + 2\text{HPO}_4^{2-} \rightarrow 2\text{H}^+ + \text{Ca}_3(\text{PO}_4)_2$ in beer (4)
9. Name an advantage and disadvantage for the equation above. (2)
10. The 10.1 receives the 10.2 and uses the 10.3 produced in the malt to convert the 10.4 to 10.5. The 10.6 is separated from the solids, boiled to increase its 10.7 along with 10.8 which add 10.9 and 10.10 to the beer. The boiled wort is 10.11 and 10.12, from where it goes on to act as the 10.13 for 10.14 to fuel the 10.15. (15)
11. At what point does the malster stop germination (2)
12. Name the process that inhibits embryo growth but not enzymes during malting. (1)
13. How is this process achieved? (3)
14. What is produced from the above process? (1)
15. Aeration of beer in the fermenter creates foam; name an ingredient use that overcomes this problem. (1)

16. How would you test the completion of starch breakdown during mashing? (1)
17. You do not require DMS in your beer, how would you modify the barley (malt) so that no DMS is produced during boiling? (2)
18. What precursor is responsible for butterscotch flavor in beer? (1)
19. Answer the questions in True or False give the correct characteristic for the false options; based on *saccharomyces cerevisiae* (8)
- a. Light flavor
 - b. Skimming
 - c. Poorer fining
 - d. Ferment melibiose
 - e. Ale beers
20. Which would be the quickest way to detect non brewer's yeast contamination? (1)

QUESTION 3**[20]**

21. Briefly name the basic nutrients used to produce penicillin (3)
22. If the temperature fluctuated above 100°C would this affect the penicillin production? (1)
23. Why is it important to monitor the temperature (2)
24. How would you control the temperature? (4)
25. What is the difference (in biological terms) between immunity and resistance? (5)
26. In the laboratory, 26.1 are exposed to the 26.2 which after a few days results in the production of a 26.3 in response to the antigens responsible. 26.4 are then extracted from the animal and fused with cells taken from a 26.5. (5)

QUESTION 4**[10]**

27. With the growing pollutants and contaminants; name the areas of concerns for an environmental biotechnologist (10)

Total Marks [120]