

[A-42]

SL

No. of Printed Pages: 2

Sardar Patel University

M.Sc. (Integrated) Biotechnology, Tenth Semester Examination

Thursday, 23<sup>rd</sup> April, 2015

10:30 a.m. to 1:30 p.m.

PS10CIGEB2: Bio-renewable Energy resources

Total Marks: 70

Note:

1. Figures to the right indicate marks.
2. Draw neat and labeled diagram, wherever necessary.

**Q.1 Attempt the following (08)**

- I** ----- is the primary green house gas.  
(a) NO<sub>2</sub> (b) CO (c) CO<sub>2</sub> (d) NO
- II** ----- is formed by ABE ( Acetone, Butanol, Ethanol) fermentation.  
(a) Butanol (b) methanol (c) Both a and b (d) None of these
- III** ----- is the predominant methanogenic bacteria in cattle dung fed digester.  
(a) *Methanobacterium* (b) *Methanosarcina* (c) *Methanosaeta* (d) All of these
- IV** In SSB biogas fermenter, SSB stands for  
(a) Solid-phase stratified bed (b) Startoified phases solid bed  
(c) Straight-phase solid bed (d) None of these
- V** Which of the following fuel cells operates at high temperature 600-1000°C?  
(a) Alkaline fuel cells (b) Solid oxide fuel cell  
(c) Regenerative fuel cell (d) Molten carbonate fuel cell
- VI** Proton exchange membrane fuel cells, also known as-----  
(a) Polymer electrolyte membrane fuel cells (b) Alkaline electrolyte membrane fuel cells  
(c) Non polymer electrolyte membrane fuel (d) All of these
- VII** ..... Species have the capacity to accumulate oil in the form of triacylglycerols.  
(a) Non oleaginous green microalgae (b) Oleaginous green microalgae  
(c) Both (a) and (b) (d) None of these
- VIII** Most common fatty acid in micro algae are..... carbon fatty acid.  
(a) 1 and 5 (b) 7 and 12 (c) 13 and 16 (d) 16 and 18

**Q.2 Attempt the followings. (Attempt any Seven) (14)**

- 1 Write the methods for conversion of biomass to electricity in brief.
- 2 What is syngas?
- 3 What do you mean by biomethanation?
- 4 What is pretreatment and why it is required for biogas production?
- 5 Write the advantages of enzymatic biofuel cell.
- 6 What do you mean by biofuel cell?
- 7 Write a short note on direct methanol cell.
- 8 Write the short note on algae as a source of biofuel production.
- 9 What are the biofuels products derived from algae.

- Q.3 A Write a detailed note on Biodiesel. (06)  
B Write the classification of biofuel in detail. (06)  
OR
- Q.4 B Give a note on pros and cons of biofuel. (06)  
A Discuss the factors affecting biogas production. (06)  
B Write a detailed note on types of bioreactors for biogas production. (06)  
OR
- Q.5 B Give an account on benefits and draw backs of biogas system. (06)  
A Write a detail note on solid oxide cell and proton exchange membrane cell (06)  
B What do you mean by biological hydrogen production? Discuss in detail about bio-hydrogen production pathway. (06)  
OR
- B Explain the principle and mechanism of acid and alkaline cells. (06)
- Q.6 A Give a detail account on metabolic engineering and molecular biology of algae for fuel production.. (06)  
B Discuss the factors affecting lipid and oil production in micro and macro algae. (06)  
OR
- B Write short notes on the following: (06)  
(i) Photobioreactor for microalgae.  
(ii) Scale- up and commercialization.

**ALL THE BEST**