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SEAT No. \_\_\_\_\_

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Sardar Patel University  
M.Sc. Integrated Biotechnology  
IGEBT- x<sup>th</sup> Semester  
PS10CIGEB2 (Biorenewable Energy Resources)  
Wednesday, 20<sup>th</sup> March 2019  
10:00 am to 1:00 pm

Q.1 Multiple choice questions: (08)

- 1 Oxygenated fuel that act as octane rating enhancers is \_\_\_\_\_.  
(a) Syngas (c) Bioalcohol  
(b) Bioethers (d) Vegetable oil
- 2 A heating process that separates the oil fraction in oil shale mining is called \_\_\_\_\_.  
(a) Retorting (c) Refining  
(b) Crushing (d) Reclamation
- 3 Hydrogen can be recovered through \_\_\_\_\_.  
(a) Membrane separation process (c) Biomethanation process  
(b) Aerobic digestion (d) Incineration process
- 4 Gasification of biomass is which type of conversion process?  
(a) Biochemical (c) Thermochemical  
(b) Chemical (d) Biological
- 5 \_\_\_\_\_ has solid polymer membrane sandwiched between two gas diffusion layers and electrodes.  
(a) Solid oxide cell (c) Biofuel cell  
(b) Acid and alkaline cell (d) Proton exchange membrane cell
- 6 Phosphoric acid cell have been developed for \_\_\_\_\_ uses.  
(a) Stationary (c) Mobility  
(b) Transportation (d) All of these
- 7 Triacylglyceroles are accumulated in many algae species as \_\_\_\_\_ products.  
(a) Storage (c) Fats  
(b) Lipids (d) Sugars
- 8 Oleaginous green microalgae species that have the capacity to accumulate oil in the form of \_\_\_\_\_.  
(a) Triacylglycerols (c) GPI- anchored protein  
(b) Malonyl moiety (d) Glycosylglyceride

①

(P.T.O.)

- Q.II** Answer the following (Any seven) (14)
1. Draw the classification of Biofuel.
  2. Give the advantages of vegetable oil.
  3. What do you mean by biomethanation?
  4. What is pretreatment and why it is required for biogas production?
  5. Enlist different types of animal based and water based material used for biogas production.
  6. What do you mean by bio fuel cell?
  7. Draw the figure which shows the components of the photosynthetic system.
  8. Write a short note on phosphoglycerids.
  9. What are the benefits and risks of algal bio fuel products?
- Q.III** (a) Give a detailed note on Oil shale mining and processing. (06)  
(b) Explain "Electricity from Biomass" in detail. (06)
- OR**
- (b) Write a note on transesterification process for biodiesel production. (06)
- Q.IV** (a) Enlist different physic-chemical factors affecting biogasification. (06)  
Explain any two in detail.  
(b) Discuss about land based Raw material use for Biogas production. (06)
- OR**
- (b) Give a detailed note on types of Bioreactors for biogas production. (06)
- Q.V** (a) Write a short note on basic concept of fuel cell. Differentiate between solid oxide cell and proton exchange membrane cells. (06)  
(b) Explain the principle and mechanism of acid and alkaline cells with suitable diagram. (06)
- OR**
- (b) What do you mean by biological hydrogen production? Discuss in detail about bio- hydrogen production pathway. (06)
- Q.VI** (a) Give a detailed account on production of algal bio fuel from seaweeds. (06)  
(b) Define algal lipids. Explain any two polar glycerolipids in detail. (06)
- OR**
- (b) Discuss in detail about photo- bioreactors for microalgae cultivation. (06)