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**M.E. / M.TECH. DEGREE EXAMINATIONS, MAY 2019**

Second Semester

**BY18018 – BIOFUELS AND BIOENERGY***(Biotechnology)***(Regulation 2018)****Time: Three Hours****Maximum : 100 Marks**

Answer ALL questions

**PART A - (10 X 2 = 20 Marks)**

1. Define calorific value and moisture content.
2. What is Renewable Fuel Standard?
3. Why are we making gasoline, diesel, and jet fuels instead of ethanol?
4. How are these biofuels chemically different relative to conventional fossil fuels?
5. Name any four algae for biofuel production.
6. Define biodrying.
7. How does the production of biomass and ethanol affect the environment?
8. State the importance of non-conventional energy source.
9. What is meant by energy conservation?
10. What kind of lands are suitable for to grow poplars?

**PART B - (5 X16 = 80 Marks)**

11. (a) Explain in detail the fundamental concepts in biofuel and bioenergy production. **(16)**  
**(OR)**  
(b) Explain the calorific value determination by bomb calorimeter with neat diagram. **(16)**
12. (a) (i) Discuss any two feedstock for biofuel production. **(8)**  
(ii) Compare in detail starch based, sugar based biofuel sources. **(8)**  
**(OR)**  
(b) (i) Explain the production of biofuel from manure. **(8)**  
(ii) Explain the production of biofuel from sewage sludge. **(8)**

13. (a) (i) Distinguish first and second generation biofuels. (8)

(ii) Explain in detail ethanol blending in petrol. (8)

**(OR)**

(b) Discuss bioenergy production from microbial fuel cells with neat flow diagram. (16)

14. (a) Explain the pelleting and chipping pre treatment methods for biofuel production. (16)

**(OR)**

(b) Compare in detail thermochemical conversion and biochemical conversion methods for the production of biofuels. (16)

15. (a) Explain the environmental assessment of the production of biodiesel from waste oil. (16)

**(OR)**

(b) Discuss in detail feedstock cost, capital cost, operating cost for biofuel production. (16)