

Roll No. : (in figure) _____ (in words) _____

Student Index No. _____ Regn. No. _____ of _____

Time : Two Hours

Full marks : 40

Questions are of value as indicated in the margin

Part - I
(Objective and Short Answer Type)
(Use only ball point pen)

Time : 20 minutes

Full marks : 10

- Note:** 1. Answer in question paper itself.
2. Striking, rewriting or overwriting are not allowed in the objective type questions.

1. Write True (T) or False (F) for the following statements:

6×0.5=3

- a) Biogas technology significantly reduces BOD. ☐
- b) Hydrocyclone can be used to separate the ester & glycerol phases. ☐
- c) Imbert's gasifier is better than Startified gasifier. ☐
- d) In Fast Pyrolysis, the particle size is around 0.1 mm. ☐
- e) The C/N ratio of 25:1 is taken as optimum for biogas production. ☐
- f) Compound Parabolic Concentrator has higher area of absorber with respect to solar collecting area. ☐

2. Fill up the blanks with appropriate phrases or number:

7×0.5=3.5

- a) KOH, with a 7:1 alcohol : vegetable oil molar ration can give _____% of methyl ester yield in 18 minutes.
- b) Neat biodiesel has flash point of _____°C.
- c) Density of diesel is _____ Kg/m³.
- d) Biogas can be upgraded to synthetic natural gas (SNG) by removing H₂S and _____.
- e) One Kg of fresh cattle dung has a volume of _____ litres.
- f) Wood chip of about _____ cm size is used in biomass gasifier.
- g) In solar cell, p-n junction silicon is doped with _____ & _____.

(2)

3. Match the following groups:

7×0.5=3.5

Column-A

- a) Algae
- b) Wind
- c) Solar PV appliance
- d) Janata biogas plant
- e) H₂S
- f) Cell wall
- g) CO

Column-B

- i) Chinese type
- ii) Biofuel
- iii) Water resources
- iv) Biomass
- v) Controller
- vi) Biogas
- vii) Control circuits

Column-C

- ()
- ()
- ()
- ()
- ()
- ()
- ()

B.Sc. (Ag.) Honours Semester-VI Examination, 2017

Course No: AEG-321 (Renewable Energy)

Part - II
(Descriptive Type)

Time : 100 Minutes

Full marks : 30

Questions are of value as indicated in the margin

Answer *any four* questions.

4. a) Briefly explain different geothermal energy generation technique with neat sketches. 3
b) Describe different types of solar plate collectors. 3
c) How horizontal type turbines are better than vertical type in wind mills? 1.5
 5. a) Explain Briquetting process with necessary diagram. How its products are different from charcoal. 4
b) Describe pyrolysis process. Briefly explain any two types of pyrolysis reactors. 3.5
 6. a) Briefly explain manure collection system for a biogas plant. Highlight briefly the benefits and limitation of biogas. 3.5
b) Calculate the total power available from a wind mill with following information. Cross-sectional area is 14m^2 velocity 29 Km/hr, neglect density of air. Also, calculate the average power output if mean annual wind speed is 22 Km/hr. Assume efficiency at 45%. 4
 7. a) Describe different chemical process in biogas production. 4
b) Briefly explain the principle of wind energy production. Also, highlight characteristics of rotor. 3.5
 8. a) What is photovoltaic? Briefly give an overview of the solar panel materials. 4
b) Describe briefly how thermal application is different from photovoltaic. 2.5
c) What is cooling duct in a solar panel? 1
 9. a) Briefly explain biodiesel processing in batch process. 4
b) Describe briefly combustion chemistry and engine problem issues with biofuel. What is cellulosic biofuel? 3.5
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