

MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Agricultural Engineering)

Semester	: I (New)	Term	: I	Academic Year	: 2019-20
Course No.	: REE 111	Title	: Engineering Chemistry		
Credits	: 2(1+1)	Time	: 10.00 to 12.00	Total Marks	: 40
Day & Date	: Wednesday, 01.01.2020				

- Note :
1. Solve ANY EIGHT questions from SECTION "A".
 2. All questions from SECTION "B" are compulsory.
 3. All questions carry equal marks.
 4. Draw neat diagrams wherever necessary.

SECTION "A"

- Q.1 State the characteristics of a good fuel.
- Q.2 Compare liquid and gaseous fuels.
- Q.3 a) Distinguish between gross and net calorific value of fuel.
b) A 0.72 gram of a fuel containing 80% carbon, when burnt in a bomb calorimeter, increased the temperature of water from 27.3° to 29.1° C. If the calorimeter contains 250 grams of water and its water equivalent is 150 grams, calculate the HCV of the fuel.
- Q.4 Draw a well labeled diagram of fractional distillation of crude petroleum.
- Q.5 Distinguish between producer gas and biogas.
- Q.6 What is natural gas? Name the different types of natural gas. Give the uses of natural gas.
- Q.7 a) What are the factors which affect corrosion?
b) List corrosion control methods.
- Q.8 Describe galvanic corrosion with its mechanism and well labeled diagram.
- Q.9 a) Explain clearly the importance of viscosity in selecting a lubricating oil for particular use.
b) An oil of unknown viscosity -index has a Saybolt universal viscosity of 58 seconds at 210° F and of 580 seconds at 100° F. The high viscosity -index standard (i.e. Pennsylvanian) oil has Saybolt universal viscosity of 58 seconds at 210° F and 430 seconds at 100° F. The low viscosity -index (i.e. Gulf oil) has a Saybolt universal viscosity of 58 seconds at 210° F and 780 seconds at 100° F. Calculate the viscosity-index of unknown oil.
- Q.10 Write short notes. (Any Two)
- a) Classification of coal by rank b) Pitting corrosion
c) Scale and sludge formation in boiler d) Graphite

(P.T.O.)

SECTION "B"

Q.11 Define the following terms.

- | | |
|--------------|--------------|
| 1) Cracking | 2) Knocking |
| 3) Corrosion | 4) Lubricant |

Q.12 Choose the correct answer.

- 1) The calorific value of coal sample is higher, if its _____.
- | | |
|-----------------------------|-------------------------|
| a) Moisture content is high | b) Ash content is high |
| c) Volatile matter is high | d) Fixed carbon is high |
- 2) For improving anti-knock property of petro, it is mixed with _____.
- | | |
|---------------------|---------------------------------------|
| a) Lead bromide | b) Allyl bromide |
| c) Tetra ethyl lead | d) Tetra ethyl lead and ethyl bromide |
- 3) During electrochemical corrosion in acidic environment _____.
- | | |
|-----------------------------------|------------------------------------|
| a) Oxygen evolution occurs | b) Oxygen absorption occurs |
| c) Hydrogen evolution takes place | d) Hydrogen absorption takes place |
- 4) The single most important property of lubricating oil is its _____.
- | | |
|---------------|---------------------|
| a) Fire-point | b) Cloud- point |
| c) Oiliness | d) Viscosity- index |

