Roll No. .....

TCH–101

B. TECH. (FIRST SEMESTER)
MID SEMESTER EXAMINATION, 2019
(ALL BRANCHES)
ENGINEERING CHEMISTRY

Time :1 : 30 Hours

Maximum Marks : 50

Note : **(i)** All questions are compulsory.

(ii) Answer any *two* sub questions among (a), (b) and (c) in each main question.

(iii)Total marks for each main question are **ten.**

1. Attempt any *two* parts of choice from (a), (b) and **(c).** (2 x 5=1 0 Marks)

(la) Distinguish between gross and net calorific value of a fuel.

(b) What is a fuel ? Give the different types of fuels with example.

(c) Give composition of Biogas plant and give its *two* application&

2. Attempt any *two* parts of choice from (a), (b) and (c). (2×5=10 Marks)
   (a) Predict the shape of water molecule on the basis of VSPER theory.
   (b) Explain, why Ne_e molecule does, not exist ?
   (c) Explain metallic bonding on the basis of band theory.

3. Attempt any *two* parts of choice from (a), (b) and (c). (2x5=10 Marks)
   (a). Write a short note on scale formation in boilers.
   (b) Why do we express hardness of water in terms of $CaCO_3$ equivalent ?
   (c) flow many grams of $CaSO_4$ dissolved per litre gives 70 ppm of hardness ?

4. Attempt any *two* parts of choice from (a), (b) and (c). ×5=10 marks)
   (a) Difference between bonding molecular orbitals and antibonding molecular orbitals.
   (b) Explain, water is a liquid while H_2S is a gas ?
   (c) Write energy level diagram of N2 and calculate the bond order.

5. Attempt any *two* parts of choice from *(a), (b)* and (c). (2x5=10 Marks)
   (a) Difference between Temporary and Permanent hardness.
   (b) Explain the principle of Zeolite treatment for water softening.
   (c) Calculate LCV of a fuel which *has* 890 hydrogen and its HCV is 6500 cal/g (latent heat of steam = 500 cal/g).