REG.NO.:

VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

SCHOOL OF CHEMICAL ENGINEERING
CONTINUOUS ASSESSMENT TEST -I
FALL SEMESTER 2024-2025

SLOT: G1+TG1

Programme Name & Branch	**: B.Tech (Chemical Engineering)**
Course Code	**: BCHE314L**
Course Name	**: Fuels and Combustion**
Faculty Name	**: D Chitra**
Class Number	**: VL2024250103312**
Date of Examination	**: 31-8-2024**
Exam Duration	**: 90 minutes**

Maximum Marks: 50

General instructions:

- Answer ALL Questions
- Assume necessary and appropriate data if required

Q. No	Question	Marks
1.	2.499 g of coal sample was taken in a silica crucible and heated in an oven maintained at 110°C for one hour. The weight after heating was 2.368 g. The same sample was analyzed for volatile matter and the weight obtained was 1.75 g, the sample was further heated without the cover until a constant weight was obtained. The last residue was found to weigh 0.95 g. Calculate the percentage of moisture, volatile matter, ash, and fixed carbon for this sample.	10
2.	A sample of coal contains C = 93%, H = 6%, and ash = 1%. The following data were obtained when the above coal was tested in a bomb calorimeter. Weight of coal burnt = 0.92 g Weight of water taken = 550 g Water equivalent of a bomb calorimeter = 2200 g Rise in temperature = 2.42°C Fuse wire correction = 10 cal Acid correction = 50 cal Calculate the gross and net calorific value of the coal, assuming that the latent heat of condensation of steam is 580 cal/g	10
3.	Explain with a neat diagram, Otto Hoffmann's process for the manufacturing of metallurgical coke. Mention the merits of this process over the Beehive oven method.	10
4.	Discuss various factors that are taken into account before it is decided to use the coal for a particular purpose.	10
5.	Explain the following process with the help of a neat and labelled sketch. (i) Dehydration of crude oil (5 Marks) (ii) Electrical desalting of crude oil (5 Marks)	10

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