Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

V SEMESTER B.TECH. (CHEMICAL ENGINEERING)
END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: ENERGY ENGINEERING [CHE 4016]

REVISED CREDIT SYSTEM
(01/12/2016)

Time: 3 Hours MAX. MARKS: 100

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A.	Explain the principle, working and advantages of a tidal power generation system.	(8 marks)
1B.	Explain the following terminologies (i)Weaver flame speed factor (ii)Blast Saturation temperature (iii)Wobbe index	(6 marks)
1C.	Discuss on Energy pricing in India and about Clean development Mechanism and its opportunities.	(6 marks)
2A.	Explain briquetting of lignite. What are carbonized briquettes?	(5 marks)
2B.	Describe on factors to be considered for selection of burners and explain any one type of gas burner with its advantages	(5 marks)
2C.	Classify the different petroleum refinery process and explain about reforming, cracking and visbreaking processes.	(10 marks)
3A.	Discuss the principal reactions involved in air-blown producer gas and explain their demerits. What is the advantage of using wet blast?	(10 marks)
3B.	Describe the following terminologies: (i)Coalification (ii)Caking (iii)Oil agglomeration (iv)humic coals (v)spontaneous inflammation	(10 marks)
4A.	Explain Koppers-Totzek process of gasification system with a neat sketch. State its advantages.	(5 marks)
4B.	Explain the following test methods and their significance in utilization of liquid fuels (i) Cetane number, (ii) Pour point, (iii) Fire point, (iv) Carbon residue (v) Diesel index	(10 marks)
4C.	A gaseous fuel contains CO_2 : 3.4%, C_2H_4 : 3.7%, C_6H_6 : 1.5%, O_2 : 0.3%, CO : 17.4%, H_2 : 36.8%, CH_4 : 24.9% and N_2 : 12.0%. It is burnt with air in a furnace. The CO_2 analyser shows 10.0% in the flue gases. Calculate (i) the percent excess air used (ii) the complete orsat analysis of the flue gases.	(5 marks)
5A.	Explain about cleaning and purification of gaseous fuels?	(5 marks)

5B.	What is the velocity of flame propagation? What is flammability limit? Explain about different categories of flame.	(8 marks)
5C.	What is coal bed methane? What is weathering index? What are the effects of weathering of coal?	(7 marks)