Subject Code: 152206 Subject Name: Fuel Technology Time: 10:30 am - 01:00 pm Instructions: 1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. Q-1 (a) Explain the procedure of Ultimate analysis. Also list out two difference between proximate analysis and ultimate analysis. (b) Write brief procedure to fine out calorific value of gaseous fuel by Junker's Gas calorimeter. Q-2 (a) Explain various physical properties of Metallurgical coke. (b) (i)A coal has following proximate analysis on ait dried basis: M=moisture-1.5%, A=ash=15.5, Vm=volatile matter = 28%, FC=Fixed carbon=55%. Calculate its ash % on dry basis and volatile matter on d.a.f (Dry ash free) andd.m.m.f (dry mineral matter free) basis. (ii)Define following terms: 1)Caking coal 2) Caking index OR (b) (i)The following results were obtained when a sample of fuel Oil was tested by Bomb Calorimeter. Mass of water =1200gm, temperature rise of cooling water=3.23%, mass of oil=0.9gm, cooling correction factor=0.06° c, mass of fuse wire=0.03gm, calorific value of fuse wire=1500kj/kg, specific heat of water = 4.19kj/kg° k (Cw), water equivalent of calorimeter=2.5kj/kg. Determine the calorific value of the fuel. (ii) Define following terms: 1) Hydrogenation 2) Charcoal 3) Carbonization Q-3 (a) List out various uses of coal. (b) List out and explain various factors affecting composition of coke oven gas. Also list out various characteristics of coke oven gas. OR Q-3 (a) Write short note on: 1)Beehive Method of coke production 2) Peat and Bituminous coal 3) Hard-grove grind-ability Index (b) Explain about various Reaction zones presents in producer gas production. (c) Explain about various Reaction zones presents in producer gas production. (d) List out various uses of Natural gas. Also give various disadvantages of C.N.G. OR Q-4 (a) Give descriptive introduction about Liquefied petroleum gas(L.P.G) (b) Explain KopperTotzek gasification process with its advantages and dis advantages.	
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Q-5 (a) Explain following properties of petroleum. 1) Viscosity 2) Octane number 3) Anti knocking value 4) Cloud point	07 07 07
(b) Give brief idea about Water gas with its uses. OR	07
 Q-5 (a) Explain Acid, Alkali and clay treatment of petroleum products. (b) Give idea about solid fuel used for producer gas manufacture. Also write uses of produces gas. **********************************	07 07

Enrolment No.____

Seat No.: ____