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**UNIVERSITY OF PETROLEUM  
AND ENERGY STUDIES**



**End Semester Examination – December, 2017**

**Program/course: MBA (OG)**

**Subject: FOGB**

**Code : MDSO 801**

**No. of page/s: Five pages**

**Semester – I**

**Max. Marks : 100**

**Duration : 3 Hrs**

**Note : Answer Q 1 to Q20 in chronological order only. Draw a diagram if so required.**

**SECTION A**

**[20]**

**Attempt all questions. Each carries equal marks.**

- 1) What made WTI a global benchmark? (2)
- 2) Explain the advantages of Emergency Response Plan in Oil and Gas installation? (2)
- 3) The positive effect of Auto Fuel Policy in environment. (2)
- 4) Conceptual outcome of Bonn (November 2017) agreement to curb the pollution related to OG. (2)
- 5) Identify with reasons two important aspect of Hydrocarbon Policy that has not been so successful. (2)
- 6) Explain the conceptual diagram for an oil pipeline. (2)
- 7) Idea of Gas Pipeline philosophy , role of pumps / compressors. (2)
  
- 8) Identify the reasons / business environment for global GTL growth. (2)

**Fill in the blanks, with reasoning**

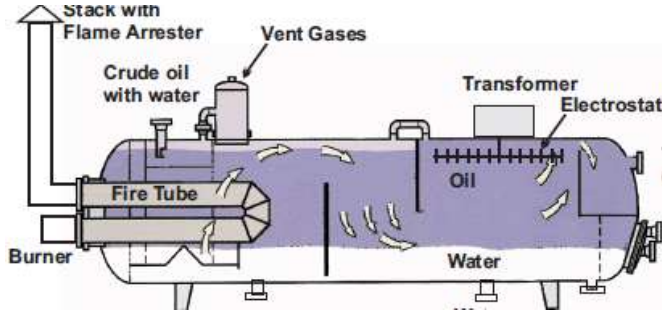
- 9) 1 BTU = \_\_\_\_\_ calories , In an LNG tanker of 135000 m<sup>3</sup> capacity , its BTU will be .....  
(2)
  
- 10) CNG is popular fuel for \_\_\_\_\_ type of vehicles (public transport or private transport) because .....

**Section B:**  
**(Maximum Marks – 20)**

Answer in brief (each question carries 5 marks)

(20 marks)

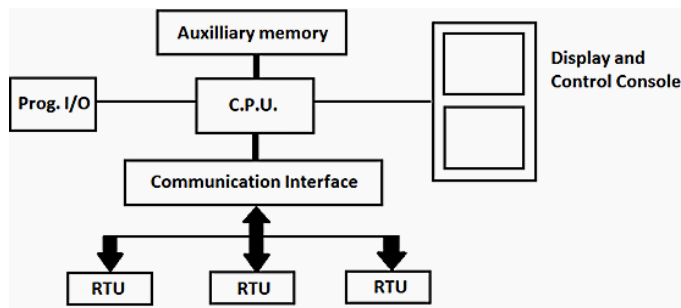
11) Explain briefly the use of following in a plant.



(5)

12) Explain the diagram link the same with OG context :

(5)



13) What is the role of oil and gas in global economy? Will a renewable be a threat in future?

(5)

14) Draw the value chain for petroleum oil business. What is the process for carbon dioxide removal from natural gas?

(5)

**Section C:**  
**(Maximum Marks – 40)**

All questions carry equal marks (10 marks each).

15) Pipelines are a very important mode of oil and gas transportation. Please describe the activities which are supported by IT. Describe the role of IT in marketing of petrol and diesel. (10)

16) How is LNG produced? What are the functions of a regasification terminal in LNG chain? (10)

17) A factory uses 100 Kiloliters diesel for standby generators every month. Price of HSD is Rs 60 per liter. The factory owner will switch to natural gas. The conversion from diesel to natural gas will be on heat equivalent basis. If the price of natural gas is Rs 1250 per mmbtu, answer the following questions:

- a. What is the quantity of natural gas required per month in SCM units? ( 3 marks)
- b. Calculate the amount of natural gas required in mmbtu per month? (3 marks)
- c. What is the saving / extra cost per month for running on natural gas? (4marks)

Use the following information:

- i. Calorific value of diesel is 10000 Kcal per kg
- ii. Calorific value of natural gas is 8500 Kcal per SCM
- iii. Specific gravity of diesel is 0.85 g/ml
- iv. 1 BTU = 252 calories

If you require any other data, make a reasonable assumption

- 18) The prevailing concept of IPP, EPP and TPP for petroleum products , also the concept of HH, JCC and NBP for natural gas. Can you identify and explain the difference in two given concepts in OG? (10)

#### **Section D:**

#### **(Maximum Marks – 20)**

- 19) Explain the case by answering the questions given in the end. (20marks)

### **Keystone XL pipeline**

The Canadian company TransCanada hopes to begin building the northern section of an oil pipeline that would trek close to 2,000 miles from Alberta, Canada to the Gulf Coast of Texas. If constructed, the pipeline, known as Keystone XL, will carry one of the world's dirtiest fuels: tar sands oil. Along its route from Alberta to Texas, this pipeline could devastate ecosystems, pollute water sources and jeopardize public health.

Giant oil corporations invested in Canada's tar sands are counting on the Keystone XL pipeline to make the expansion of oil extraction operations there profitable: The pipeline would double imports of dirty tar sands oil into the United States and transport it to refineries on the Gulf Coast and ports for international export.

Unfortunately, an area the size of Florida is already set for extraction. Before TransCanada can begin construction, however, the company needs a presidential permit from the Obama administration because the pipeline crosses an international border.

#### ***Tar sands oil***

Pollution from tar sands oil greatly eclipses that of conventional oil. During tar sands oil production alone, levels of carbon dioxide emissions are three to four times higher than those of conventional oil, due to more energy-intensive extraction and refining processes. The Keystone XL pipeline would carry 830,000 barrels of dirty tar sands oil into the United States daily, and result in climate-damaging emissions equal to adding more than 5.6 million new cars to U.S. roads.

## ***Water waste and pollution***

During the tar sands oil extraction process, vast amounts of heat, water and chemicals are needed to separate the tarry substance (known as bitumen) from sand, silt, and clay and to flow up the pipeline. The water used in the process comes from rivers and underground aquifers. It takes **three barrels of water** to extract each single barrel of oil. Ninety-five percent of the water used to extract the oil, which is about 2.4 million barrels per day, is so polluted that the water must be stored in large human-made pools, known as tailing ponds. As the heavy bitumen sinks to the bottom of these ponds, the toxic sludge, full of harmful substances like cyanide and ammonia, works its way into neighboring clean water supplies.

## ***Forest Destruction***

The tar sands oil are underneath the world's largest intact ecosystem, the Boreal forests of Alberta. The forests not only serve as an important carbon sink, but its biodiversity and unspoiled bodies of water support large populations of many different species. They are a buffer against climate change as well as food and water shortages. However, in the process of digging up tar sands oil, the forests are destroyed. This valuable forest and its endangered caribou are both threatened by the pipeline.

## ***Indigenous populations***

Northern Alberta, the region where tar sands oil is extracted, is home to many indigenous populations. Important parts of their cultural traditions and livelihood are coming under attack because of tar sands operations. Not only have indigenous communities been forced off of their land, but also those living downstream from tailing ponds have seen spikes in rates of rare cancers, renal failure, lupus, and hyperthyroidism. In the lakeside village of Fort Chipewyan, for example, 100 of the town's 1,200 residents have **died from cancer**.

These problems will only get worse, unless tar sands production is halted. Investing in a new pipeline would increase the rate of production, while decreasing the quality of life for indigenous populations.



[Click to enlarge.](#)

## ***Pipeline spills***

The Keystone XL pipeline would traverse six U.S. states and cross major rivers, including the Missouri River, Yellowstone, and Red Rivers, as well as key sources of drinking and agricultural water, such as the Ogallala Aquifer which supplies water to more than one fourth of America's irrigated land and provides drinking water for two million Americans.

The probability of spills from this pipeline is high and more threatening than conventional spills, because tar sands oil sinks rather than floats, making clean ups more difficult and costly. TransCanada's first pipeline proves that this threat is real, as it spilled a dozen times in less than a year of operation. Experts warn that the more acidic and corrosive consistency of the type of tar sands oil being piped into the U.S. as well as the risk of external corrosion from higher pipeline temperatures makes spills more likely, and have joined the EPA in calling on the State Department to conduct a thorough study of these risks.

In the summer of 2010, a million gallons of tar sands oil poured into the Kalamazoo River in Michigan from a pipeline run by another Canadian company, Enbridge. Although nearly one billion dollars have been spent over the past three years to clean up the spill, almost 40 miles of the river are still contaminated.

In April 2013, a 22-foot crack in an Exxon pipeline caused a devastating tar sands oil spill that began in a residential neighborhood of Mayflower, Arkansas and into Lake Conway, a drinking water source and popular fishing spot. Residents of the community were unaware of the pipeline under their town until this massive spill.

### ***Refining tar sands oil***

After traveling through the Keystone XL pipeline, tar sands oil would be brought to facilities in Texas to be further refined. Refining tar sands oil is dirtier than refining conventional oil, and results in higher emissions of toxic sulfur dioxide and nitrous oxide. These emissions cause smog and acid rain and contribute to respiratory diseases like asthma. Communities near the refineries where the Keystone XL pipeline terminates, many of them low-income and communities of color, already live with dangerously high levels of air pollution. The Keystone XL pipeline would further exacerbate the heavy burden of pollution and environmental injustices these communities confront.

One dangerous and high-carbon byproduct of these refineries is petroleum coke, or petcoke. Although petcoke is produced inexpensively, it is costly to store and is often dumped into open pits. Burning petcoke is more carbon-intensive than burning coal, so the United States Environmental Protection Agency will no longer permit power plants in the United States to do so. However, plants in China, India, and Latin America import petcoke as a cheap coal substitute.

### ***Stopping the pipeline***

Tar sands oil is one of the dirtiest fuels on the Earth. Facilitating the exploitation of the tar sands will delay investments in clean and safe alternatives to oil, such as better fuel economy requirements, plug-in electric cars fueled by solar power, and smart growth and public transportation infrastructure that give Americans choices other than cars. In order to avoid devastating effects on the climate from a global rise of 2 degrees Celsius, such as the melting of the Arctic ice, sea level rise, and more extreme tornados and hurricanes and more floods and heat waves, the International Energy Association says that up to two-thirds of known fossil reserves must remain untouched.

Looking at the huge demand for energy in the US, Will you allow this pipeline to be executed ?

**Concepts : Energy demand in US, HSE issues, Employments, Economic impacts on Canada and US. ( Only 5 relative concepts given above are to be considered in this case)**