**Questionbank (Petroleum Chemistry)**

**Q1: Fill in the blanks in each of the following:**

1. **Crude oils are principally found in oil reservoirs associated with …………….., beneath the earth’s surface.**
2. **The hydrocarbons in crude oil are mainly ………….. , ……….., and ………**
3. **Crude oil with low sulfur content (<0.5%) is classified as …………….., crude oil with a higher sulfur content (˃0.5%) is classified as ……………..**
4. **Aromatic compounds such as …………….., ………………., and …………… are present in the composition of crude oil.**
5. **Crude oil can generally be classiﬁed by the geographic location it is produced in ………………, …………….., and ……………..**

**Q2: Choose the correct answers to the following:**

**Crude oil with low sulfur content (>0.5%) is classified as**

1. **Sweet oil B) Basic oil C) light oil D) Sour oil**

**Q3: Explain briefly non-hydrocarbons in the composition of crude oil.**

**Q4: Explain Marcellin Berthelot theory for the formation of crude oil.**

**Q5: Explain biogenic theory for the formation of crude oil.**

**Q7: Explain Dmitri Mendele'ev theory for the formation of crude oil.**

**Q6: Describe briefly the upstream, midstream, and downstream sectors in the petroleum industry briefly.**

**Q8: Explain briefly types of hydrocarbon molecules appear in crude oil.**

**Q9: Explain briefly Paraffin hydrocarbon with examples in crude oil**

**Q10: Explain briefly aromatic hydrocarbon with examples in crude oil**

**Q11: Write acidic and non-acidic of sulfur compounds with examples in crude oil**

**Q12: Describe oxygen compounds in crude oils with examples**

**Q13: Describe basic and non-basic nitrogen compounds in crude oil.**

**Q14: Explain metallic compounds in crude oil with example.**

**Q15: What are the main disadvantages of high level of sulfur compounds in crude oil?**

**Q 16: Classify crude oils according to API gravity.**

**Q 17: Classify crude oils according to chemical composition.**

**Q 18: Classify crude oils according to sulfur compounds.**

**Q19: Define the following with mentioning their importance:**

1. Ash content
2. Cetane number
3. TAN
4. Distillation curve
5. Salt content
6. Aniline point
7. TBN
8. Pour point
9. Octane number
10. Carbon residue
11. API
12. Flash point

**Q20: What is the difference between Close-cup and Open-cup flash point?**

**Q21: What are the normal ranges of TBN value in lubricant oils?**

**Q22: What are the main reasons for dehydration and desalting of crude oils?**

**Q23: Write the main properties of transformer oil.**

**Q24: Describe the common treating of crude oils before the Refinery processing.**

**Q25: Describe the atmospheric distillation products in the Refinery processing.**

**Q26: Describe the vacuum distillation products in the Refinery processing.**

**Q27: Design a flow chart diagram for the electrostatic single-stage desalting unit.**

**Q28: Design a flow chart diagram for atmospheric distillation of crude oil.**

**Q29: Design a flow chart diagram of Vacuum distillation of crude oil.**

**Q30: Describe Kerosene fraction in the Refinery process**

**Q31: Describe Naphtha fraction in the Refinery process**

**Q32: Describe asphalt fraction in the Refinery process**

**Q33: Describe Diesel fraction in the Refinery process**

**Q34: Calculate API gravity of 100 ml diesel sample. If you know that (dwater at 25 °C = 0.99869 g/ml and (weight of diesel sample= 82 g)**

**Q35: A gasoline fuel sample is generated by blending 10% by weight of 1-butene, 70% of triptane, and 20% of isodecane. Determine the antiknock index and fuel sensitivity for the blended fuel sample using the following table:**

|  |  |
| --- | --- |
| **Type of fuel** | **Octane number** |
| **MON** | **RON** |
| **1-Butene** | **80** | **99** |
| **Isodecane** | **92** | **113** |
| **Triptane** | **101** | **112** |

**Q36: A diesel fuel sample has an aniline point of (71 °C) and a cetane index of (49). Calculate its density at 60 °F assuming that the density of H2O at 60 °F is 0.99897g/cm3.**

**Q36: What are the required properties of LPG?**

**Q37: Design a flow chart diagram of the separation of LPG from petroleum products.**

**Q38: Explain the types of hydrocarbon molecules that appear in the gasoline fraction.**

**Q39: What is the difference between VGO and AGO?**

**Q40: Explain De-waxing or De-asphalting of base oil.**

**Q41 Explain briefly SAE grades of lubricant oils.**

**Q42 Explain API grades of lubricant oils.**

**Q43 What is biodiesel?**

**Q44: Explain the types of grease.**