

INSTRUCTION:

This section consists of **FOUR (4)** structured questions. Answer **ALL** questions.

ARAHAN:

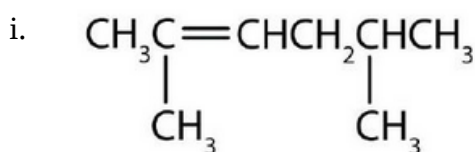
Bahagian ini mengandungi EMPAT (4) soalan berstruktur. Jawab SEMUA soalan.

QUESTION 1**SOALAN 1**

CLO1
C1

(a) Name the compounds below according to IUPAC system:

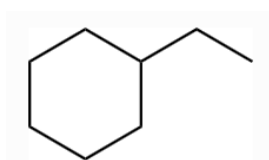
Namakan sebatian berikut mengikut sistem IUPAC:



[2 Marks]

[2 Markah]

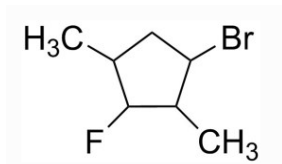
ii.



[2 Marks]

[2 Markah]

iii.



[2 Marks]

[2 Markah]

CLO1
C2

- (b) Aliphatic hydrocarbon is a compound containing carbon and hydrogen joined together in straight chains, branched chains and non-aromatic rings. Some examples of the aliphatic hydrocarbon are alkane, alkene and alkyne. Explain alkane, alkene and alkyne.

Hidrokarbon alifatik adalah sebatian mengandungi karbon dan hidrogen dikaitkan dengan rantai lurus, rantai cabang dan lingkaran bukan aromatik. Contoh-contoh hidrokarbon alifatik ialah alkane, alkena dan alkuna. Terangkan alkana, alkena dan alkuna.

[9 Marks]

[9 Markah]

CLO1
C3

- (c) Any of a large class of chemical compounds in which one or more atoms of carbon are covalently linked to atoms of other elements are organic compound, most commonly hydrogen, oxygen, or nitrogen.

Demonstrate the chemical structure of the following compounds.

Mana-mana kelas sebatian kimia terbesar dimana satu atau lebih atom karbon yang terikat dengan unsur-unsur adalah sebatian organik, seperti hidrogen, oksigen atau nitrogen.

Tunjukkan struktur kimia sebatian berikut.

- i. 3,4-dimethylhexane
3,4-dimetilheksana

[2 Marks]

[2 Markah]

- ii. 1,2-diethylcyclobutane
1,2-dietilsiklobutana

[2 Marks]

[2 Markah]

- iii. 2,3-dimethyl-2-butene
2,3-dimetil-2-butena

[2 Marks]

[2 Markah]

- iv. 1-methylcyclohexene
1-metilsikloheksena

[2 Marks]

[2 Markah]

- v. Bromobenzene
Bromobenzene

[2 Marks]

[2 Markah]

QUESTION 2

SOALAN 2

CLO1
C1

- (a) Rocks formation takes different processes. Their formations are classified according to the rock types since the processes involved normally results in a characteristic relationship between the mineral grains. List down **TWO (2)** examples of the following type of rocks:

Pembentukan batu yang berlainan mengalami proses yang berbeza. Pembentukan tersebut diklasifikasikan mengikut jenis batu kerana proses yang terlibat biasanya menghasilkan hubungan ciri antara mineral. Senaraikan DUA (2) contoh bagi jenis-jenis batu berikut:

- i. Igneous rock
Batu igneous

[2 Marks]

[2 Markah]

- ii. Sedimentary rock
Batu sedimen

[2 Marks]

[2 Markah]

- iii. Metamorphic rock
Batu metamorfik

[2 Marks]

[2 Markah]

CLO1
C2

- (b) A trap forms when the buoyancy forces driving the upward migration of hydrocarbons through a permeable rock cannot overcome the capillary forces of a sealing medium. The timing of trap formation relative to that of petroleum generation and migration is crucial to ensuring a reservoir can be formed.

Explain **TWO (2)** types of petroleum reservoir.

Sebuah perangkap terbentuk apabila daya apungan yang memindahkan penghijrahan hidrokarbon ke atas melalui batu telap tidak dapat mengatasi daya kapilari dari medium pengedap. Masa pembentukan perangkap berbanding dengan penjanaan petroleum dan penghijrahan adalah penting untuk memastikan takungan boleh dibentuk.

*Terangkan **DUA (2)** jenis takungan petroleum.*

[8 Marks]

[8 Markah]

CLO1
C3

- (c) The Accelerated Mechanism of Reservoir; this reservoir responds to the withdrawal of fluid in order to maintain the pressure. A virgin reservoir is under sufficient pressure to push hydrocarbons to surface. As the fluids are produced, the pressure will often decline, and production will falter.

Demonstrate the Gas Cap Drive of the reservoir drive mechanism.

Takungan "Accelerated Mechanism"; takungan ini bertindak balas terhadap pengurangan bendalir untuk mengekalkan tekanan. Takungan baru berada dibawah tekanan yang mencukupi untuk menolak hidrokarbon ke permukaan. Apabila bendalir dihasilkan, tekanan akan menurun, dan pengeluaran akan berkurangan.

Tunjukkan "Gas Cap Drive" untuk "drive mechanism" takungan.

[11 Marks]

[11 Markah]

QUESTION 3

SOALAN 3

CLO2
C1

- (a) During petroleum processing, when the pressure is reduced on certain types of crude oil, tiny bubbles of gas are encased in a thin film of oil when the gas comes out of solution. This may result in foam, or froth, being dispersed in the oil and creates what is known as “foaming” oil.

List out **FIVE (5)** main factors that assist in “breaking” the foaming oil.

*Semasa pemprosesan petroleum, apabila tekanan dikurangkan ke atas minyak mentah, buih-buih akan terhasil semasa gas-gas dibebaskan dari campuran. Perkara ini boleh menyebabkan perbuihan dan dipanggil perbuihan minyak. Senaraikan **LIMA (5)** faktor-faktor utama untuk memecahkan perbuihan minyak tersebut.*

[5 Marks]

[5 Markah]

CLO2
C2

- (b) Casing operations occur periodically throughout the drilling process starting with the surface casing, intermediate casing, and ending with production string which takes place during well completion.

Describe **ALL** the equipment used for casing installation.

Operasi pemasangan selongsong berlaku secara berkala sepanjang proses penggerudian, bermula dengan pemasangan selongsong permukaan, selongsong tengah, dan berakhir dengan sambungan penghasilan apabila penghasilan telaga minyak selesai.

*Terangkan **SEMUA** peralatan yang digunakan untuk pemasangan selongsong.*

[10 Marks]

[10 Markah]

CLO2
C3

- (c) Rotary drilling equipment currently consists of five main systems. This equipment is the main requirement of an oil rig. Rotary rig is functioned to drill the hole.

Generalize **ALL** functions of the main systems.

Alat pengerudian berputar mengandung lima sistem utama. Alat ini adalah satu keperluan di pelantar minyak. Pelantar berputar berfungsi untuk menggerudi lubang.

*Terangkan secara umum **SEMUA** fungsi-fungsi sistem utama tersebut.*

[10 Marks]

[10 Markah]

QUESTION 4

SOALAN 4

CLO2
C1

- (a) Fractional distillation of crude oil is the separation of the crude oil into its component parts, or fractions.

Name **SEVEN (7)** distillation products from the distillation process.

Penyulingan berperingkat untuk minyak mentah ialah proses pemisahan minyak mentah kepada komponen-komponen yang lebih kecil.

*Namakan **TUJUH (7)** hasil penyulingan penyulingan daripada penyulingan tersebut.*

[7 Marks]

[7 Markah]

CLO2
C2

- (b) Catalytic Fragmentation is a heavy gas oil breaking process when heat and pressure imposed in the presence of catalyst to promote cracking process.

Explain **ALL** main sections in fragmentation process.

Pemecahan katalitik adalah suatu proses pemecahan gas minyak berat apabila haba dan tekanan dikenakan semasa kehadiran mangkin untuk melancarkan proses pemecahan.

*Terangkan **SEMUA** seksyen utama di dalam proses pemecahan.*

[8 Marks]

[8 Markah]

CLO2
C2

- (c) Gas processing plant is designed and built to treat hydrocarbon gas mixture received from some gas field.

Generalize **ALL** major process units in the gas processing plant.

Loji pemprosesan gas direka dan dibina untuk merawat campuran gas hidrokarbon yang diterima dari beberapa medan gas.

*Terangkan secara umum **SEMUA** unit proses utama dalam loji pemprosesan gas.*

[10 Marks]

[10 Markah]

SOALAN TAMAT