

INSTRUCTION:

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

ARAHAN:

*Bahagian ini mengandungi **EMPAT (4)** soalan struktur. Jawab semua soalan.*

QUESTION 1**SOALAN 1**

- | | |
|------|---|
| CLO1 | <p>(a) State the main raw materials used in ethylbenzene production.
<i>Nyatakan bahan mentah utama yang digunakan dalam pengeluaran ethylbenzene</i></p> <p style="text-align: right;">[5 marks]
[5markah]</p> |
| CLO1 | <p>(b) Explain the main purpose of the Transalkylation Reactor in the production of ethylbenzene.
<i>Terangkan tujuan utama Transalkylation Reactor dalam pengeluaran ethylbenzene.</i></p> <p style="text-align: right;">[5 marks]
[5markah]</p> |
| CLO1 | <p>(c) Write THREE (3) main reactions process chemistry involved in the production of ethylbenzene.
<i>Tuliskan TIGA (3) tindakbalas proses kimia yang terlibat di dalam pengeluaran ethylbenzene.</i></p> <p style="text-align: right;">[15 marks]
[15 markah]</p> |

QUESTION 2

SOALAN 2

CLO2

- (a) State **THREE (3)** synthesis gases produced for methanol production in Lurgi Megamethanol Technology.

*Nyatakan **TIGA (3)** synthesis gas untuk pengeluaran methanol dalam Lurgi Megamethanol Technology.*

[5 marks]

[5 markah]

CLO2

- (b) The Desulfurization process is one of the essential processes needed in the syngas generation process for methanol production. Explain the desulfurization process.

Penyingkiran sulfur merupakan salah satu proses yang diperlukan dalam penghasilan gas sintesis untuk pengeluaran methanol. Huraikan tentang proses penyingkiran sulfur.

[5 marks]

[5 markah]

CLO2

- (c) Methanol can be converted to olefin (ethylene and propylene) via the UOP/Hydro MTO process. Complete the process flow diagram of olefin production in Figure 2(c).

Methanol boleh ditukarkan kepada olefin (etilena dan propilena) melalui proses MTO oleh UOP/Hydro. Lengkapkan gambarajah aliran proses pengeluaran olefin pada Rajah 2(c).

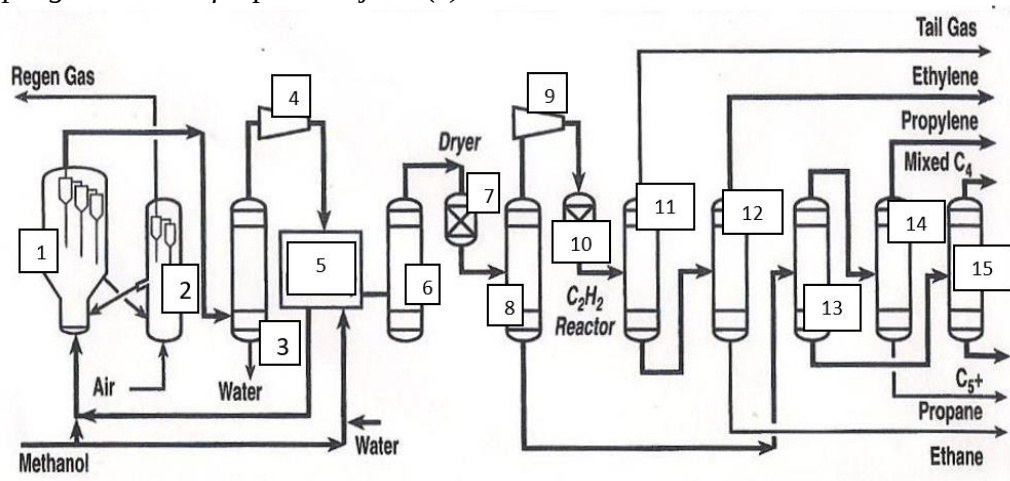


Figure 2(c) / Rajah 2(c)

[15 marks]

[15 markah]

QUESTION 3

SOALAN 3

CLO1

- (a) Styrene monomer (SM), or vinylbenzene is an important industrial chemical used to manufacture of various polymers. In Styrene Monomer Production Technology, describe the major reactions involved in Classic Styrene (SM) process and SMART processes.

Styrene monomer (SM), atau vinylbenzene adalah kimia penting yang digunakan dalam pelbagai pembuatan polimer. Dalam Pengeluaran Styrene Monomer Teknologi, jelaskan tindakbalas utama terlibat dalam Classic Styrene (SM) process dan SMART Process.

[10 marks]

[10 markah]

CLO1

- (b) In ExxonMobil PxMax, p-xylene is produced from the reaction of toluene. Complete the process flow diagram of p-xylene production in Figure 3(b).

Dalam ExxonMobil PxMax, p-xylene dihasilkan dari tindakbalas toluene. Lengkapkan gambarajah aliran proses penghasilan p-xylene pada Rajah 3(b).

[10 marks]

[10 markah]

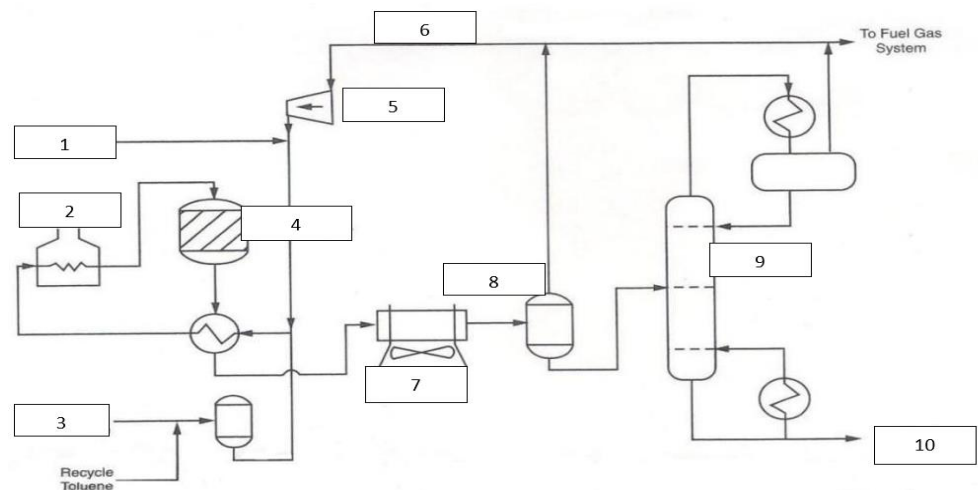


Figure 3(b) / Rajah 3(b)

CLO1

- (c) Differentiate between the Classic styrene reactor system and SMART styrene reactor system with the appropriate drawing.

Dengan bantuan lukisan yang berkaitan, bezakan Classic styrene reactor system dan SMART styrene reactor system.

[5 marks]

[5 markah]

QUESTION 4

SOALAN 4

CLO2

- (a) Spherilene technology is used to produce polyethylene. The process involves Catalyst activation and feeding, Polymerization and Finishing. Draw the process flow diagram of polypropylene production with complete labelling.

Teknologi 'spherilene' digunakan untuk menghasilkan polietilena. Proses melibatkan 'Catalyst activation and feeding, Polymerization and Finishing'. Lukiskan gambarajah aliran proses bagi pengeluaran polypropylene dengan label yang lengkap.

[15 marks]

[15 markah]

CLO2

- (b) In Spherilene process, determine the function of steam and nitrogen in the finishing section.

Dalam proses 'Spherilene', tentukan fungsi steam dan nitrogen pada bahagian finishing.

[5 marks]

[5 markah]

CLO2

- (c) In UNIPOL Polypropylene Process Technology, several generations of Catalysts have been developed for better reactions in polypropylene production. Justify the advantage of the fourth-generation catalyst for better productivity.

Dalam UNIPOL Polypropylene Process Technology, beberapa generasi pemangkin telah dibangunkan bagi menambahbaik tindakbalas dalam pengeluaran polipropilena. Justifikasikan kelebihan pemangkin generasi keempat untuk pengeluaran yang lebih baik.

[5 marks]

[5 markah]

SOALAN TAMAT