
UNIVERSITI SAINS MALAYSIA

First Semester Examination
Academic Session 2007/2008

October/November 2007

EKC 212 – Fluids Flow For Chemical Engineering
[Aliran Bendalir Kejuruteraan Kimia]

Duration : 3 hours
[Masa : 3 jam]

Please check that this examination paper consists of EIGHT pages of printed material and FOUR pages of Appendix before you begin the examination.

[Sila pastikan bahawa kertas peperiksaan ini mengandungi LAPAN muka surat yang bercetak dan EMPAT muka surat Lampiran sebelum anda memulakan peperiksaan ini.]

Instructions: Answer **SEVEN** (7) questions. Answer **ALL** (4) questions from Section A. Answer **THREE** (3) questions from Section B.

Arahan: Jawab **TUJUH** (7) soalan. Jawab **SEMUA** (4) soalan dari Bahagian A. Jawab **TIGA** (3) soalan dari Bahagian B.]

You may answer a question either in Bahasa Malaysia or in English.

[Anda dibenarkan menjawab soalan sama ada dalam Bahasa Malaysia atau Bahasa Inggeris.]

Section A : Answer ALL questions.

Bahagian A : Jawab SEMUA soalan.

1. [a] Give two differences between pipes and tubing in term of wall type and joints.

Berikan dua perbezaan dari segi jenis dinding dan penyambungan di antara paip dan tiub.

[2 marks/markah]

- [b] Air at density of 1.6 kg/m^3 is flowing past a pitot tube. The gauge indicates a pressure difference of 24 kg/ms^2 . What is the air velocity?

Udara berketumpatan 1.6 kg/m^3 melalui sebuah tiub pitot. Tolok tekanan menunjukkan perbezaan tekanan sebanyak 24 kg/ms^2 . Apakah halaju udara?

[2 marks/markah]

- [c] A flat-blade turbine with six blades is installed centrally in a vertical tank. The tank is 1.83m in diameter, the turbine is 0.61m in diameter and is positioned 0.61m from the bottom of the tank. The turbine blades are 127mm wide. The tank is filled to a depth of 1.83m with a solution of 50% caustic soda at 65.6°C , which has a viscosity of 12cP and a density of 1498 kg/m^3 . The turbine is operated at 90 rpm. The tank was unbaffled. What power will be required to operate the mixer?

Sebuah turbin berbilah rata dengan enam bilah dipasang ditengah-tengah sebuah tangki menegak. Tangki berdiameter 1.83m, serta turbin berdiameter 0.61m berkedudukan 0.61m dari dasar tangki. Bilah turbin ini berkelebaran 127mm. Tangki diisi sedalam 1.83m dengan larutan 50% soda kaustik bersuhu 65.6°C , dengan kelikatan 12cP dan berketumpatan 1498 kg/m^3 . Turbin beroperasi pada kadar 90 rpm. Tangki ini tanpa sesekat. Berapa kuasa yang diperlukan oleh turbin ini untuk beroperasi?

[6 marks/markah]

2. [a] Figure Q. 2 [a] shows an arrangement for measuring the pressure at the centre of a pipe A. The specific gravity of mercury is given as 13.56 and the density of water is 1000 kg/m^3 . What is the pressure at point A? Given that the height of air from point E that levels with point D on the other side of the arm is 20cm.

Rajah S.2 [a] menunjukkan suatu susunan untuk mengukur tekanan di tengah-tengah kedudukan paip A. Nilai graviti tentu bagi merkuri ialah 13.56 dan ketumpatan air adalah 1000 kg/m^3 . Apakah tekanan pada titik A? Diberi tinggi udara dari titik E yang searas dengan titik D di lengan yang satu lagi ialah 20sm.

...3/-