SULIT

BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI
KEMENTERIAN PENGAJIAN TINGGI

JABATAN KEJURUTERAAN AWAM

PENILAIAN ALTERNATIF

SESI DIS 2020

DCB20053 : PLUMBING SERVICES

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KAEDAH PENILAIAN : PEPERIKSAAN ONLINE

JENIS PENILAIAN : SOALAN ESEI BERSTUKTUR (2 SOALAN)

TARIKH PENILAIAN : 14 JULAI 2021

TEMPOH PENILAIAN : 1 JAM

LARANGAN TERHADAP PLAGIARISM (AKTA 174)
PELAJAR TIDAK BOLEH MEMPLAGIAT APA-APA IDEA, PENULISAN, DATA ATAU CIPTAAN ORANG LAIN. PLAGIAT ADALAH SALAH SATU PENYELEWENGAN AKADEMIK. SEKIRANYA PELAJAR DIBUKTIKAN MELAKUKAN PLAGIARISM, PENILAIAN BAGI KURSUS BERKENAAN AKAN DIMANSUHKAN DAN DIBERI GRED F DENGAN NILAI MATA 0.
(RUJUK BUKU ARAHAN-ARAHAN PEPERIKSAAN DAN KAEDAH PENILAIAN (Diploma) EDISI 6, JUN 2019, KLAUSA 17.3)

INSTRUCTION:
This section consists of TWO (2) structured questions. Answer ALL questions.

ARAHAN:
Bahagian ini mengandungi DUA (2) soalan berstruktur. Jawab SEMUA soalan.

QUESTION 1
SOALAN 1

CLO1 C3

(a) Interpret the delivery system of water supply from the water mains to the control valve using grid method sketches.
Tafsirkan sistem penghantaran bekalan air dari saluran air ke injap kawalan menggunakan lakaran kaedah grid

[7 marks]
[7 *markah*]

CLO1 C3

(b) Illustrate the layout of the direct and indirect pipe for multistorey buildings.

Ilustrasikan susun atur paip bagi sistem secara langsung dan tidak langsung bagi bangunan bertingkat.

[8 marks]
[8 *markah*]

CLO1 C3

(c) Explain in detail the factors of the loss of water seal in sanitary appliances due to the following.
Terangkan secara terperinci faktor kehilangan kedap air dalam peralatan kebersihan atas perkara berikut.

i. self-siphonage / *pensifonan sendiri*
ii. induced siphonage / *pensifonan teraruh*

[10 marks]
[10 *markah*]

CLO2
C3

QUESTION 2
SOALAN 2

(a) By using the Thomas Box Formula method, calculate the diameter of pipe from the Figure 1 below.

Dengan menggunakan kaedah Thomas Box Formula, hitungkan diameter paip dari Rajah 1 di bawah.

[7 marks]
[*7 markah*]

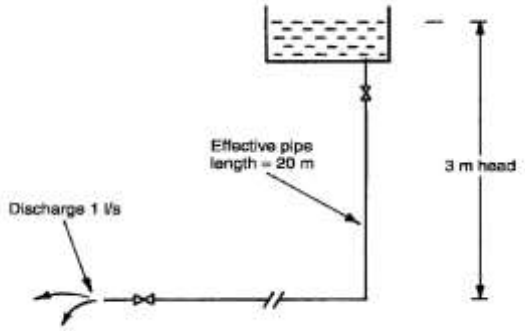

Figure 1
Rajah 1

CLO2
C3

(b) Based on the following data, calculate the size of the hot water storage tank and boiler power.

i. 10 units Bath tab – 60 litre (used 2 times a day)
ii. 20 units Wash hand basin – 3 litres (used 4 times a day)
iii. 20 units sink – 12 litre (used 3 times a day)
iv. Temperature rise – 50°C
v Boiler efficiency – 70 watt
vi. Specific heat capacity of water – 4.2kj/kg
vii. Time in seconds – 2 hours

Berdasarkan data berikut, kirakan saiz tangki air panas dan kuasa dandang.

i. 10 unit Tab mandi – 60 liter(digunapakai 2 kali sehari)
ii. 20 unit Basin basuh tangan – 3 liter (digunapakai 4 kali sehari)
iii. 20 unit sinki – 12 liter (digunapakai 3 kali sehari)
iv. Kenaikan suhu - 50°C
v. Kecekapan dandang – 70 watt
vi. Muatan haba tentu air - 4.2kj/kg
vii. Masa dalam saat – 2 jam

[8 marks]
[8 *markah*]

CLO2
C3

(c)

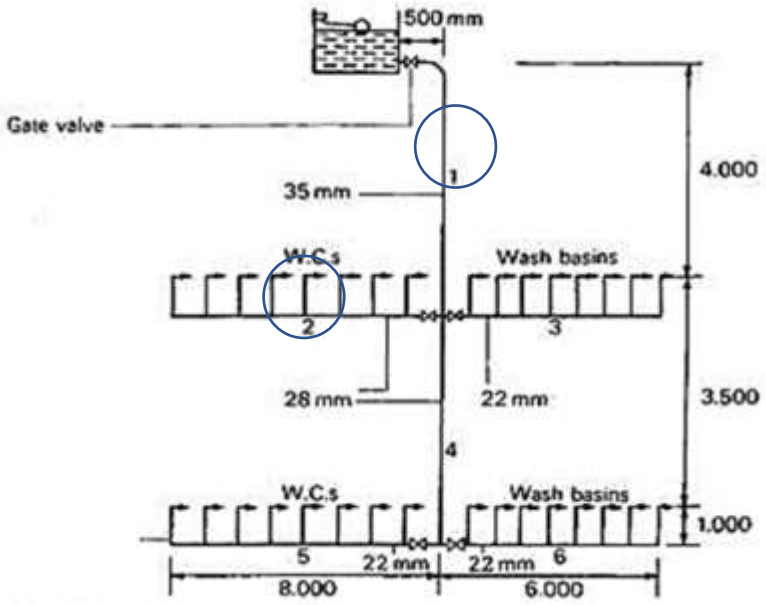

Figure 2: Pipe Sizing of Cold Water for two-storey office building

Rajah 2: Ukuran Paip Air Sejuk Untuk Bangunan Pejabat 2 Tingkat

Referring to Figure 2 above, determine the diameter of copper pipes numbered 1 and 2 using the tabulation method.

Merujuk Rajah 2 di atas, tentukan diameter paip kuprum nombor 1 dan 2 dengan menggunakan kaedah tabular.

[10 marks]
[10 *markah*]

-SOALAN TAMAT-

LAMPIRAN

Thomas Box Formula

- $d = \sqrt[5]{\frac{q^2 x 25 x L x 10^5}{H}}$

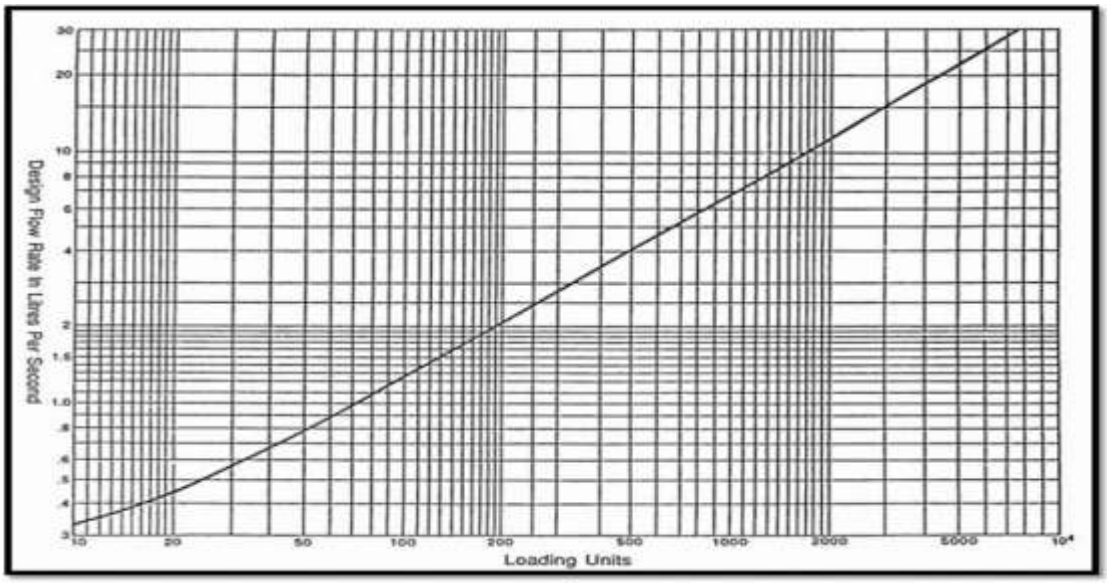

Table 1.1 gives the 'loading unit' rating for various appliances.

Table 1.1

	Loading unit rating
Dwellings and flats	
W.C. flushing cistern	2
Wash basin	1½
Bath	10
Sink	3—5
Offices	
W.C. flushing cistern	2
Wash basin (distributed use)	1½
Wash basin (concentrated use)	3
Schools and industrial buildings	
W.C. flushing cistern	2
Wash basin	3
Shower (with nozzle)	3
Public bath	22

Note: Certain sanitary appliances require a continuous flow of water throughout the whole of the time that they are being used. These include: ablution appliances fitted with spray taps, umbrella sprays, shower nozzles or similar fittings.

In buildings where high peak demands occur, a loading unit rating for such appliances is not applicable and 100 per cent of the flow rate for these appliances is required as shown in Table 1.2. The same applies to automatic flushing cisterns and for urinals.

Table 1.2 Recommended minimum rate of flow at various appliances

Type of appliance	Rate of flow (litre/s)
W.C. flushing cistern	0.12
Wash basin	0.15
Wash basin with spray taps	0.04
Bath (private)	0.30
Bath (public)	0.60
Shower (with nozzle)	0.12
Sink with 13 mm taps	0.20
Sink with 19 mm taps	0.30
Sink with 25 mm taps	0.60

Table 1.3 Frictional resistances of fittings expressed in equivalent pipe lengths

Copper			Galvanised steel			
Nominal outside diameter (mm)	Metre run of pipe		Nominal outside diameter (mm)	Metre run of pipe		
	Elbow	Tee		Elbow	Bend	Tee
15	0.5	0.6	15	0.5	0.4	1.2
22	0.8	1.0	20	0.6	0.5	1.4
28	1.0	1.5	25	0.7	0.6	1.8
35	1.4	2.0	32	1.0	0.7	2.3
42	1.7	2.5	40	1.2	1.0	2.7
54	2.3	3.5	50	1.4	1.2	3.4
62	3.0	4.5	65	1.7	1.3	4.2
76	3.4	5.8	80	2.0	1.6	5.3
108	4.5	8.0	100	2.7	2.0	6.8

In calculating the diameter of a pipe to supply individual fittings, the loss of head through the draw-off tap should also be taken into account. Table 1.4 gives the allowances for draw-off taps expressed in equivalent pipe lengths.

Table 1.4 Frictional resistances of draw-off taps expressed as equivalent pipe lengths

Fitting (BS 1010)	Discharge rate tap fully open (litre/s)	Equivalent length of pipe of same diameter as tap (m)	
		Copper	Galvanised steel
15 mm diameter bib-tap or pillar tap	0.20	2.70	4.00
20 mm diameter bib-tap or pillar tap	0.30	8.50	5.75
25 mm diameter bib-tap or pillar tap	0.60	20.00	13.00

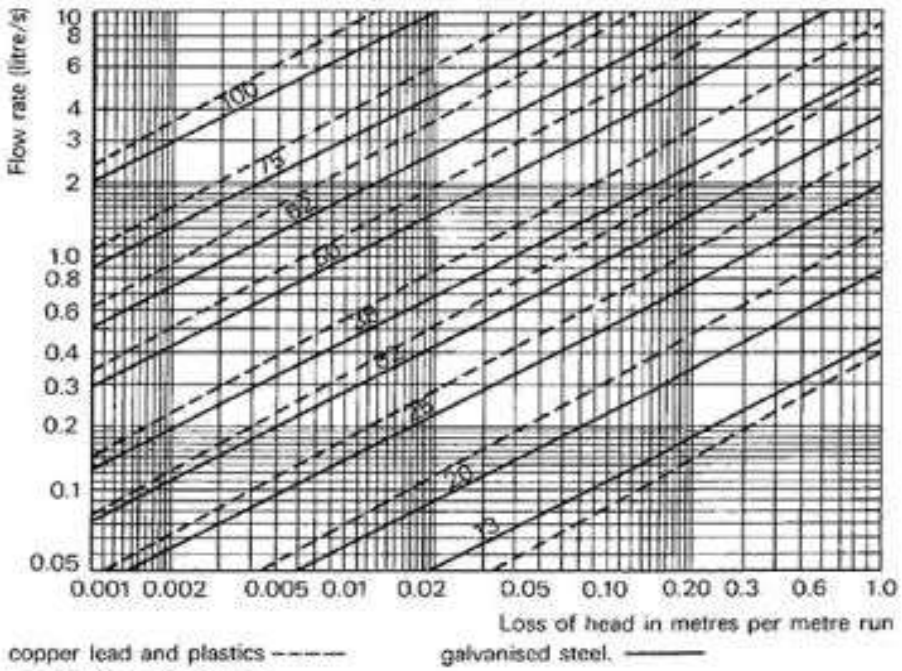

Fig. 1.2 Pipe-sizing chart

BORANG JAWAPAN PENGIRAAN SAIZ PAIP KAEDAH TABULAR

1	2	3	4	5	6	7	8	9	10	11	12
Pipe number	Loading units	Flow rate (l/s)	Estimated pipe diameter (mm)	Measured pipe run (m)	Length of pipe equal to all resistances (m)	Effective pipe length (m)	Loss of head (m/m run)	Head consumed (m)	Total head consumed (m)	Head available at point of discharge (m)	Final pipe size (mm)
1											
2											