

---

UNIVERSITI SAINS MALAYSIA

Peperiksaan Semester Kedua  
Sidang Akademik 2006/2007

April 2007

**REG 364 – Rekabentuk Struktur Keluli**

Masa: 2½ jam

---

Sila pastikan bahawa kertas peperiksaan ini mengandungi **EMPAT** muka surat yang tercetak sebelum anda memulakan peperiksaan ini.

Jawab **SEMUA** soalan.

*Please check that this examination paper consists of **FOUR** printed pages before you begin the examination.*

*Answer **ALL** questions.*

...2/-

1. Nyatakan dengan jelas apa-apa andaian anda

- (a) Dengan memberi lakaran, bincangkan beberapa bentuk keratan struktur yang terdapat sekarang.

*Please state any assumptions made*

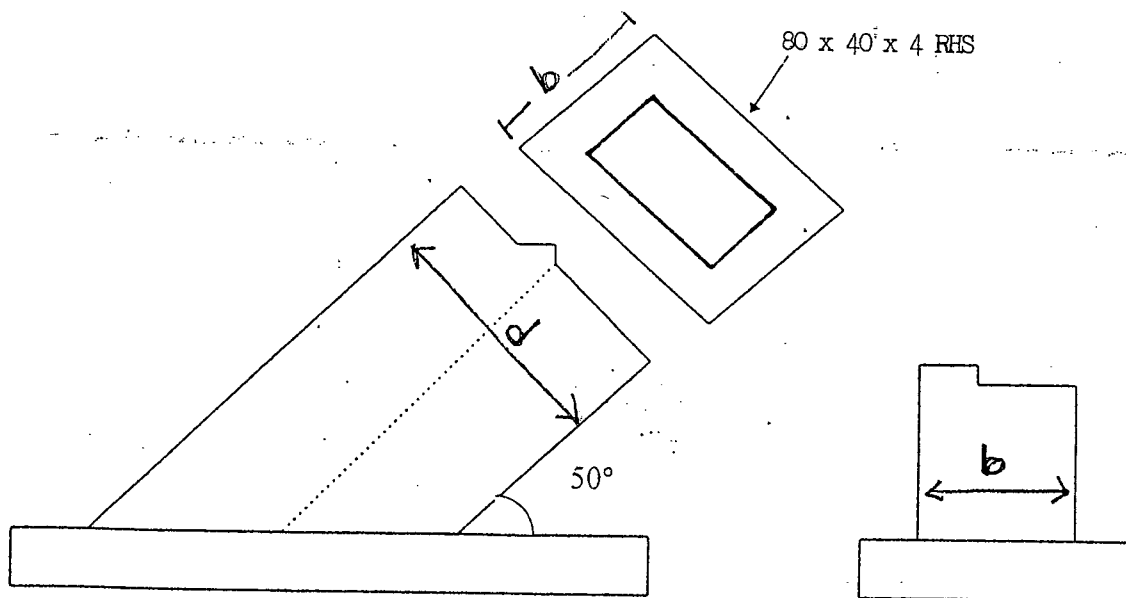
- (a) *With sketches discuss the various shape and sections of steel structures available nowadays.*

(20 markah/20 marks)

2. (a) Kira panjang intersaksi bagi sambungan dalam **Rajah 1**

- (a) *Calculate the length of intersection for joint in **Figure 1***

(20 markah/20 marks)



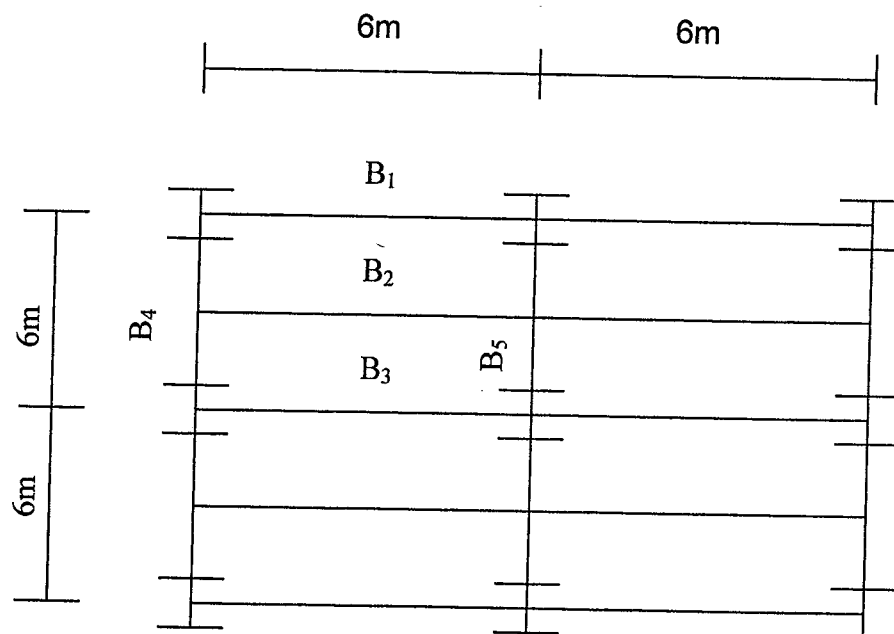
Rajah 1.

(20 markah)

- 3 -

3. (a) **Rajah 2**, menunjukkan lantai keluli dari satu bangunan. Diberi Beban Mati  $5 \text{ kN/m}^2$  dan beban Tindihan  $4 \text{ kN/m}^2$ . Dapatkan keratan yang sesuai untuk rasuk  $B_2$ . Andai Tegasan Lentur dibenarkan  $P_b = 165 \text{ N/mm}^2$ .

Figure 2 shows the steel floor of a building Given Dead Load  $5 \text{ kN/m}^2$  and Imposed Load  $4 \text{ kN/m}^2$ . Find suitable sections for beam  $B_2$ . Assume allowable bending stress  $P_b = 165 \text{ N/mm}^2$ .



Rajah 2

UB Keratan	Luas $\text{cm}^2$	$I_{xx}$ $\text{cm}^4$	$I_{yy}$ $\text{cm}^4$	$r_{xx}$ cm	$r_{yy}$ cm	$Z_{xx}$ $\text{cm}^3$	$Z_{yy}$ $\text{cm}^3$
305 x 165 x 40 kg/m	51.5	8520	763	12.9	3.85	561	92.4
356 x 171 x 45 kg/m	57	12100	812	14.6	3.78	687	95
406 x 140 x 46 kg/m	59	15600	539	16.3	3.02	778	75.7
406 x 178 x 74 kg/m	95	27300	1540	17.0	4.03	1320	172
457 x 152 x 82 kg/m	104	36200	1140	18.6	3.31	1560	149
457 x 191 x 98 kg/m	125	45700	2340	19.1	4.33	1960	243

(20 markah/20 marks)

....4/-

-4-

4. Satu tiang keratan 203 x 203 x 86 kg/m UC panjang sebenar 5m. Dapatkan beban paksi yang selamat untuk:

- (i) Hujung terikat (tegasan dibenar = 120 N/mm<sup>2</sup>).  
 (ii) Hujung dipin (tegasan dibenar = 86 N/mm<sup>2</sup>).

Keratan 203 x 203 x 86kg/m UC:

$$\begin{aligned} A &= 110\text{cm}^2 \\ r_{yy} &= 5.32\text{cm}; & I_{yy} &= 3120\text{cm}^4 \\ r_{xx} &= 9.27\text{cm}; & I_{xx} &= 9460\text{cm}^4 \end{aligned}$$

*A strut 203 x 203 x 86 kg/m UC has an actual length 5m. Calculate the safe axial load for:*

*Section 203 x 203 x 86kg/m UC:*

$$\begin{aligned} A &= 110\text{cm}^2 \\ r_{yy} &= 5.32\text{cm}; & I_{yy} &= 3120\text{cm}^4 \\ r_{xx} &= 9.27\text{cm}; & I_{xx} &= 9460\text{cm}^4 \end{aligned}$$

(20 markah/20 marks)

5. Huraikan beberapa jenis asas tiang keluli. Berikan lakaran.

*Describe the various types of bases for steel stanchions.*

(20 markah/20 marks)

- 000 O 000-