

NAMA : Tingkatan :

SULIT
3764/1
Teknologi
Kejuruteraan
Kertas 1
Ogos
2010
1 ½ jam



**BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KLUSTER
KEMENTERIAN PELAJARAN MALAYSIA**

**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2010**

TEKNOLOGI KEJURUTERAAN

Kertas 1

Satu jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Tuliskan nama dan tingkatan anda pada ruang yang disediakan
2. Kertas soalan ini mengandungi 30 soalan
3. Jawab semua soalan
4. Jawapan hendaklah ditulis pada ruang yang disediakan dalam kertas soalan
5. Kertas soalan ini hendaklah diserahkan pada akhir peperiksaan

Soalan	Markah Penuh	Markah Diperolehi
1	5	
2	2	
3	4	
4	2	
5	3	
6	4	
7	4	
8	3	
9	4	
10	3	
11	4	
12	3	
13	4	
14	3	
15	4	
16	4	
17	4	
18	4	
19	3	
20	3	
21	1	
22	4	
23	3	
24	3	
25	3	
26	3	
27	2	
28	4	
29	4	
30	3	
JUMLAH	100	/100

Kertas soalan ini mengandungi **18** halaman bercetak

1. The following are elements in Engineering Technology.
Berikut merupakan elemen-elemen di dalam Teknologi Kejuruteraan.

Match the statements below with the correct element by writing A, B, C, D and E in the boxes provided.

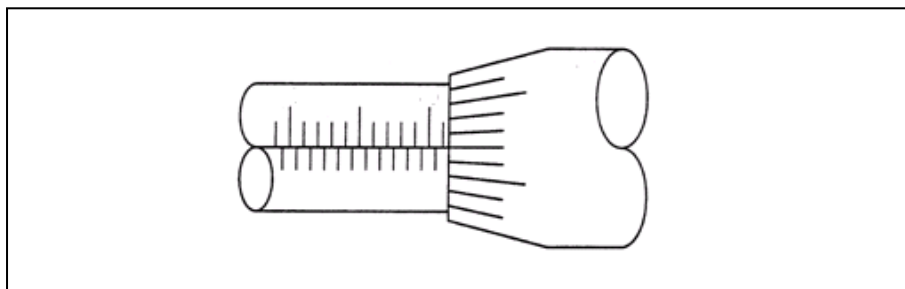
Padankan kenyataan di bawah dengan elemen yang betul dengan menulis A, B, C, D dan E pada ruang yang disediakan.

A. Industrial Design <i>Reka bentuk industri</i>	B. Construction <i>Pembinaan</i>	C. Communication <i>Perhubungan</i>
D. Transportation and power <i>Pengangkutan dan kuasa</i>	E. Manufacturing <i>Pembuatan</i>	

- Vehicle assembly activities
Aktiviti pemasangan kenderaan
- LRT system network
Rangkaian sistem LRT
- The used of mobile phone
Penggunaan telefon bimbit
- Product modification for a more comfortable use
Pengubahsuaian produk supaya lebih mesra pengguna
- Residential area to live in
Penempatan untuk kediaman.

[5 marks]

2. Complete and label the sketching of micrometer reading of 41.37 mm in the box provided.
Lengkapkan dan labelkan bacaan mikrometer 41.37 mm pada ruang yang disediakan.



[2 marks]

3. Figure 1 shows four types of cutter teeth.
 State a suitable usage for each type of cutter teeth in the spaces provided.
Rajah 1 menunjukkan empat jenis gigi pemotong.
Nyatakan kegunaan yang sesuai untuk setiap jenis gigi pemotong pada ruang yang disediakan.

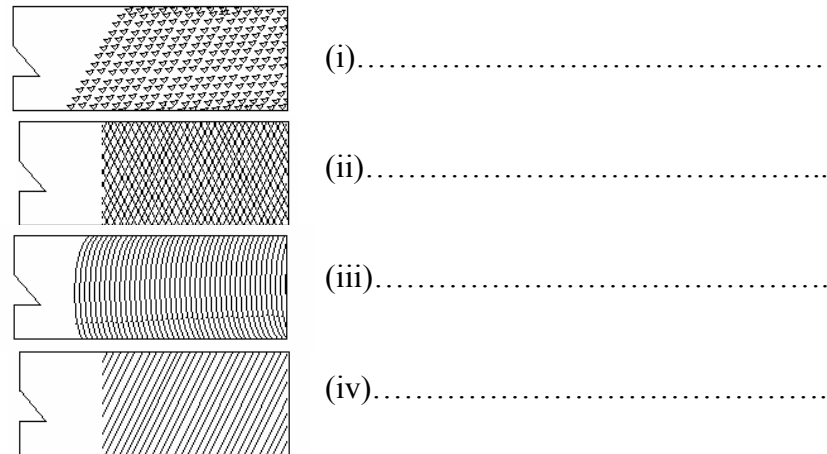


Figure 1

[4 marks]

4. Figure 2 shows a part of template in fitting work.
Rajah 2 menunjukkan sebahagian daripada templat dalam kerja menggegas.

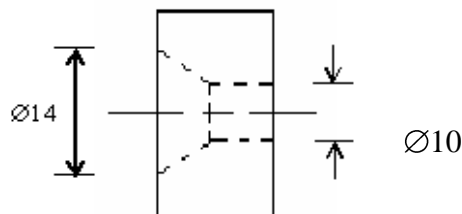


Figure 2

Rearrange the following steps in the correct order to produce countersunk hole by writing number 1, 2 and 3 in the provided boxes.
Susunkan langkah-langkah menghasilkan lubang benam dengan menulis nombor 1, 2 dan 3.

Drill countersunk hole <i>Gerudi lubang benam</i>	
Mark centre hole <i>Tandakan pusat lubang</i>	
Drill Ø10 mm hole <i>Gerudi lubang Ø10 mm</i>	

[3 marks]

5. The following are definitions of mechanical properties of metal.
Berikut merupakan definisi sifat-sifat mekanik logam.

- A. The ability of metal to withstand any penetration.
Kemampuan logam menampan daripada ditusuki.
- B. The ability of metal to withstand load or force without changing its shape.
Keupayaan sesuatu logam menanggung beban tanpa berubah bentuk.
- C. The ability of metal to be stretched without breaking.
Kebolehan logam untuk ditarik panjang tanpa pecah.
- D. The ability to maintain strength even after it has undergone permanent change in shape.
Kemampuan mengekalkan kekuatan walaupun telah mengalami perubahan bentuk kekal.

Match the above statements by writing A, B, C or D in the space provided in Table 1.
Padankan kenyataan di atas dengan menulis A, B, C atau D pada ruang yang disediakan di dalam Jadual 1.

Mechanical Properties <i>Sifat-sifat Mekanik</i>	Answer <i>Jawapan</i>
Hardness <i>Kekerasan</i>
Ductility <i>Kemuluran</i>
Strength <i>Kekuatan</i>

Table 1

[3 marks]

6. Figure 3 shows a workpiece produced by using a lathe machine. State the process of the machine in producing parts labeled A, B, C and D in the provided spaces.
Rajah 3 menunjukkan satu benda kerja yang dihasilkan oleh sebuah mesin larik. Nyatakan proses untuk menghasilkan bahagian berlabel A, B, C dan D pada ruang yang disediakan.

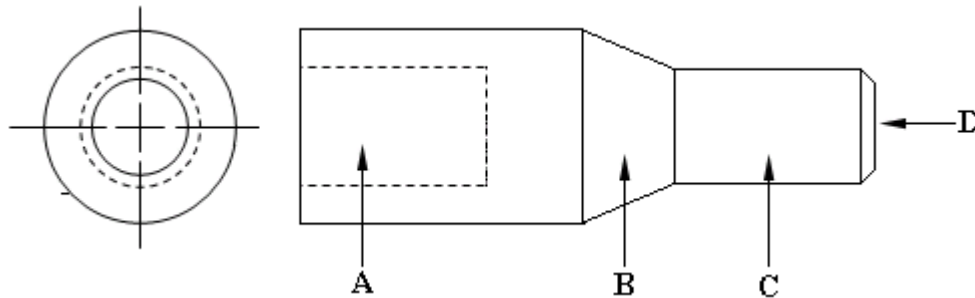


Figure 3

- A :
- B :
- C :
- D :

[4 marks]

7. The following are the steps of brazing process that are not in the correct sequence. Rearrange the steps below in the correct sequence by writing 2,3,4 and 5 in the boxes provided. Step 1 has been indicated below.
Berikut merupakan langkah-langkah dalam proses meloyang yang tidak mengikut urutan. Susun semula langkah-langkah tersebut dengan menulis 2, 3, 4 dan 5 pada kotak yang disediakan. Langkah 1 telah ditunjukkan di bawah.

Place the filler metal on the surface to be joined and heat the filler metal until it melts. <i>Letakkan logam pengisi pada permukaan yang hendak disambung dan panaskan logam pengisi sehingga lebur.</i>	
Heat the metal to be joined, ensuring that it does not melt. <i>Panaskan logam yang hendak disambung, pastikan ia tidak melebur.</i>	
Leave the joint to cool down. <i>Tunggu sehingga sambungan menyejuk.</i>	
Apply appropriate flux to the surface. <i>Sapukan fluks ke atas permukaan.</i>	
Clean the surface of the metal plate. <i>Bersihkan permukaan plat logam.</i>	1

[4 marks]

8. The following are the statements on the types of communication processes.
Berikut merupakan kenyataan tentang jenis-jenis proses perhubungan.

Between humans
Di antara manusia dan manusia

Between human and machine
Di antara manusia dan mesin

Between machine and human
Di antara mesin dan manusia

Between machines
Di antara mesin dan mesin

State the types of the following communication process based on the statements above.

Nyatakan jenis-jenis proses perhubungan berikut berdasarkan kenyataan di atas.

- (i) A telephone caller dials the phone number.
Pemanggil mendail nombor telefon

.....

- (ii) The telephone exchange makes a connection to the required telephone.
Ibu sawat telefon membuat sambungan ke telefon yang dikehendaki.

.....

- (iii) Process III: The telephone receiver hears a ringing from the telephone
Proses III: Penerima mendengar deringan telefon.

.....

[3 marks]

9. The following are four types of electronic components.
Berikut merupakan empat jenis komponen elektronik.

A	Resistor <i>Perintang</i>
B	Capasitor <i>Pemuat</i>
C	Transistor <i>Transistor</i>
D	Inductor <i>Pearuh</i>

Complete Table 2 by writing A,B,C or D in each of the spaces provided.

Lengkapkan Jadual 2 dengan menulis A, B, C atau D pada ruang yang disediakan.

Function <i>Fungsi</i>	Component <i>Komponen</i>
To control current flow in the circuit <i>Mengawal aliran arus dalam litar</i>
To limit current flow <i>Menghad aliran arus</i>
To retain charge <i>Menyimpan cas</i>
Combine with a capacitor to form oscillator circuit <i>Di ganding dengan kapasitor untuk dalam litar pengayun</i>

Table 2

[4 marks]

10. Figure 4 shows bridge rectifier circuit in a power supply circuit. Complete the circuit by drawing diode symbols in boxes A, B and C.
Rajah 4 menunjukkan litar penerus titi suatu litar bekalan kuasa. Lengkapkan litar tersebut dengan melukis simbol diod ke dalam kotak A, B dan C.

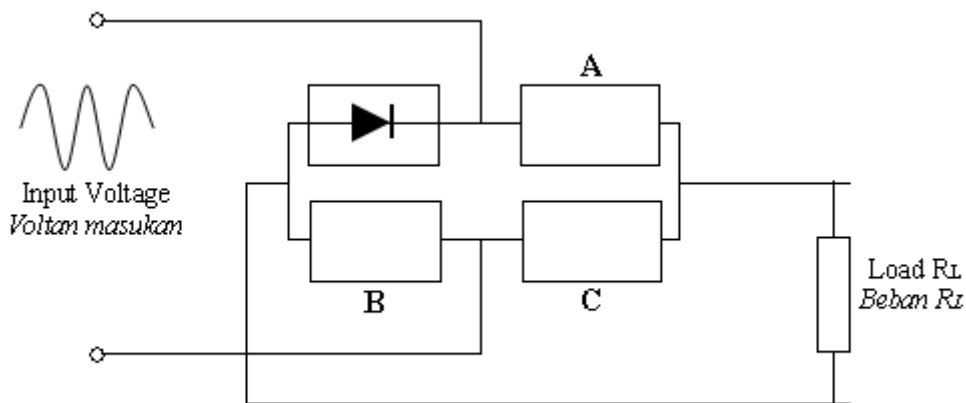


Figure 4

[3 marks]

11. Table 3 shows three types of input wave which throughout three types of electronic components. Draw an output wave.
Jadual 3 menunjukkan 3 jenis gelombang masukan yang akan melalui 3 jenis komponen elektronik. Lukiskan gelombang keluaran.

Input Wave <i>Gelombang Masukan</i>	Electronic Components <i>Komponen Elektronik</i>	Output Wave <i>Gelombang Keluaran</i>

Table 3

[3 marks]

12. The following are processes in radio wave communication.
Berikut merupakan proses-proses di dalam perhubungan gelombang radio.

X	Modulation process <i>Proses pemodulatan</i>
Y	Demodulation process <i>Proses penyahmodulatan</i>
Z	Heterodyne process <i>Proses heterodin</i>

Match the processes according to its description by writing X, Y and Z in Table 4.
Padankan proses-proses tersebut dengan keterangan yang sesuai dengan menulis X, Y dan Z dalam Jadual 4.

Description <i>Keterangan</i>	Process <i>Proses</i>
The process of removing unwanted signal from the required signal. <i>Proses menyingkirkan isyarat yang tidak dikehendaki dari isyarat yang diperlukan.</i>
The process of mixing two signals to produce intermediate signal. <i>Proses mencampurkan dua isyarat untuk menghasilkan isyarat pertengahan.</i>
The process of combining the information signal and carrier signal before being propagated to the atmosphere. <i>Proses menggabungkan isyarat maklumat dan isyarat pembawa sebelum dipancarkan ke atmosfera</i>

Table 4

[3 marks]

13. Table 5 shows types of computer hardware. Tick (✓) the appropriate boxes which identify storage media or input device.

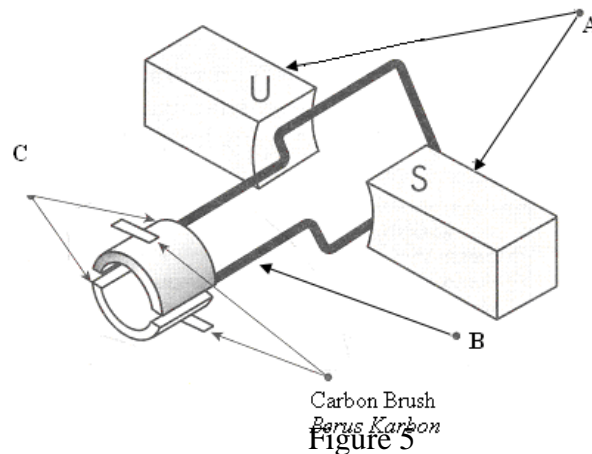
Jadual 5 menunjukkan peralatan komputer. Tandakan (✓) pada kotak yang sesuai sama ada media storan atau peranti masukan.

Computer Hardware <i>Peralatan komputer</i>	Storage Media <i>Media storan</i>	Input Device <i>Peranti masukan</i>
Keyboard <i>Papan kekunci</i>		
Hard disk <i>Cakera keras</i>		
Flash memory <i>Ingatan kilat</i>		
Scanner <i>Pengimbas</i>		

Table 5

[4 marks]

14. Figure 5 shows a simple generator.
Rajah 5 menunjukkan gambarajah penjana ringkas.



- (i) What is the type of generator?
Apakah jenis penjana itu ?

.....

- (ii) Name parts A,B and C.
Namakan bahagian A, B dan C.

A:

B:

C:

[4 marks]

SULIT

[LIHAT SEBELAH

15. Figure 6 shows the internal combustion engine.
Rajah 6 menunjukkan enjin pembakaran dalam.

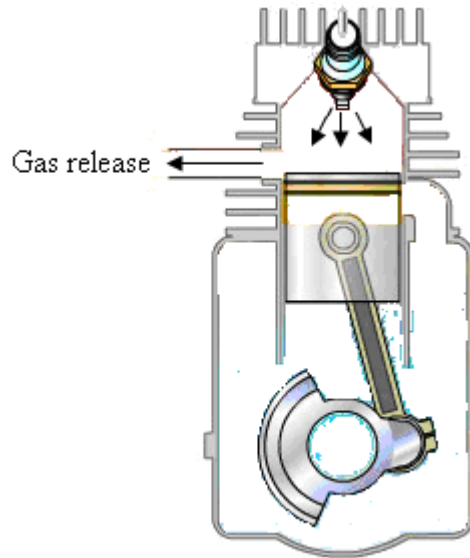


Figure 6

- (a) Name the stroke of this engine.
Namakan lejang enjin ini.
-
- (b) Complete the description stroke of this engine.
Lengkapkan keterangan lejang yang berlaku pada enjin ini.
- i) At the fixed upper point (FUP) spark plugs produce sparks.
Pada titik tetap atas(TTA) pencucuh palam mengeluarkan api.
- ii)
- iii)
- iv) The piston is pushed downwards to the fixed lower point (FLP).
Ombok ditolak ke bawah sehingga titik tetap bawah (TTB).

[3 marks]

16. By referring to Figure 7, state the function of each component by writing P, Q, R, S or T in the boxes provided.
 Dengan merujuk kepada Rajah 7, tentukan fungsi bagi setiap komponen dengan menulis huruf P, Q, R, S atau T dalam kotak yang disediakan.

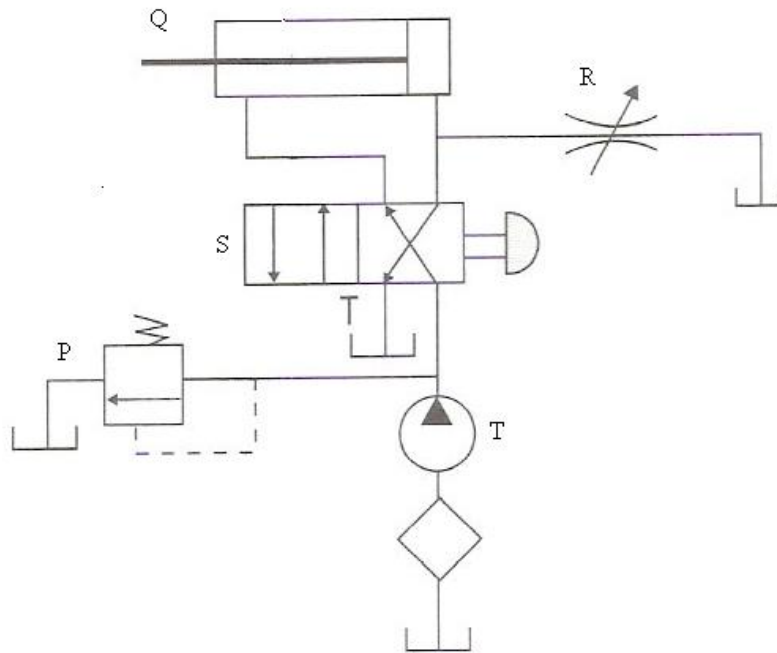


Figure 7

.....	Converts mechanical energy into hydraulic energy <i>Menukarkan tenaga mekanikal kepada tenaga hidraulik</i>
.....	Slows down the cylinder motion <i>Memperlahankan gerakan silinder</i>
.....	Controls the direction of cylinder motion <i>Mengawal arah gerakan silinder</i>
.....	Controls the fluid pressure <i>Mengawal tekanan bendalir</i>

[4 marks]

17. Figure 8 shows a part of the hydraulic system. The force for piston 1 is 20 N. Given the diameter of piston 2 is four times the diameter of piston 1
Rajah 8 menunjukkan sebahagian daripada sistem hidraulik. Daya pada omboh 1 adalah 20 N. Diberi diameter omboh 2 adalah empat kali diameter omboh 1.

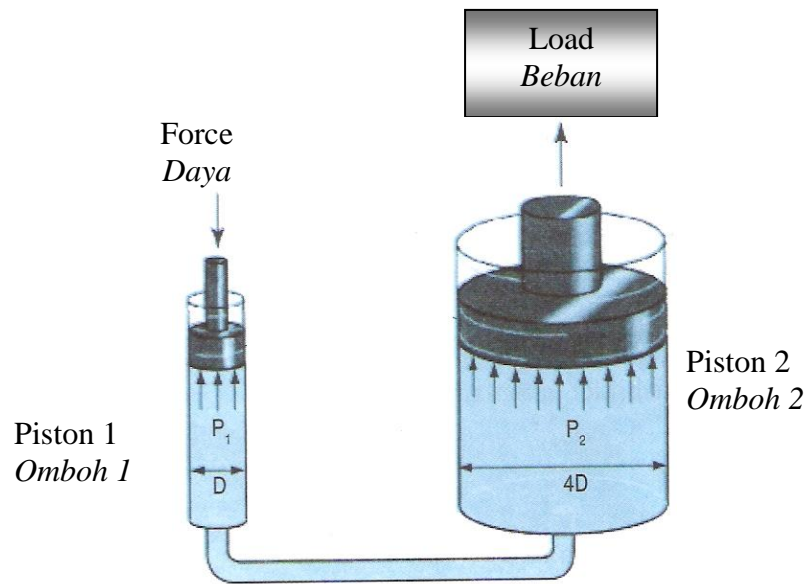


Figure 8

Calculate the force produced by piston 2.
Hitungkan daya yang terhasil oleh omboh 2.

Answer:
Jawapan:

[4 marks]

18. The following are electronic control components.
Berikut adalah komponen-komponen kawalan elektronik.

Diode	SCR	Triac	Diac
-------	-----	-------	------

Match the above components with the suitable functions as stated in Table 6.
Padankan komponen di atas dengan fungsi yang sesuai dalam ruang yang disediakan pada Jadual 6.

Function <i>Fungsi</i>	Component <i>Komponen</i>
Control the alternating current load <i>Mengawal bekalan arus ulang alik</i>	(i)
Convert alternating current to direct current <i>Menukar arus ulang alik kepada arus terus</i>	(ii)
Trigerring high current in triac <i>Memicu arus tinggi pada triak</i>	(iii)
Control the direct current load <i>Mengawal bekalan arus terus</i>	(iv)

Table 6

[4 marks]

19. Figure 9 shows a single electric control circuit
Rajah 9 menunjukkan satu litar kawalan elektrik.

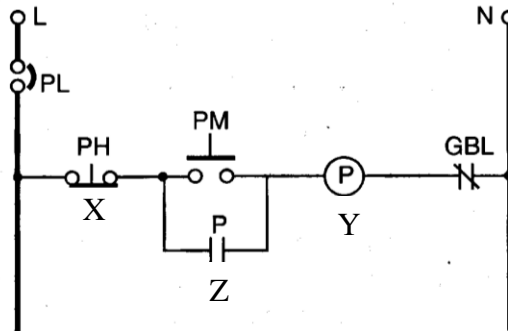


Figure 9

- (a) State the type of electric control circuit.
Nyatakan jenis litar kawalan elektrik itu.

.....

- (b) Name the components labelled:
Namakan komponen berlabel:

(i) X :

(ii) Y :

- (c) State the function of component Z.
Nyatakan fungsi komponen Z.

.....

[4 marks]

20. Table 7 shows the name of pneumatic components.
Jadual 7 menunjukkan nama komponen pneumatik.

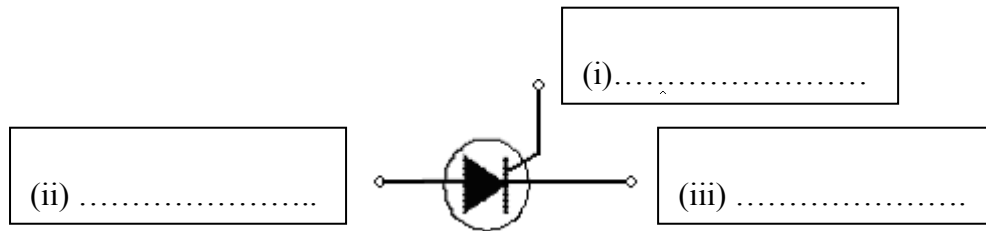
Complete Table 6 by drawing the symbol of the pneumatic component.
Lengkapkan Jadual 6 dengan melukis simbol bagi komponen pneumatik tersebut.

Component <i>Komponen</i>	Symbol <i>Simbol</i>
Filter <i>Penapis</i>	
3 ports, 2 positions valve <i>Injap 3 liang 2 kedudukan</i>	
Pressure relief valve <i>Injap pelega tekanan</i>	

Table 7

[3 marks]

21. Name the terminals for each of the SCR symbol:
Namakan tamatan bagi simbol SCR berikut:



[3 marks]

22. Figure 10 shows part of levelling staff.
Rajah 10 menunjukkan sebahagian daripada staf ukur aras.

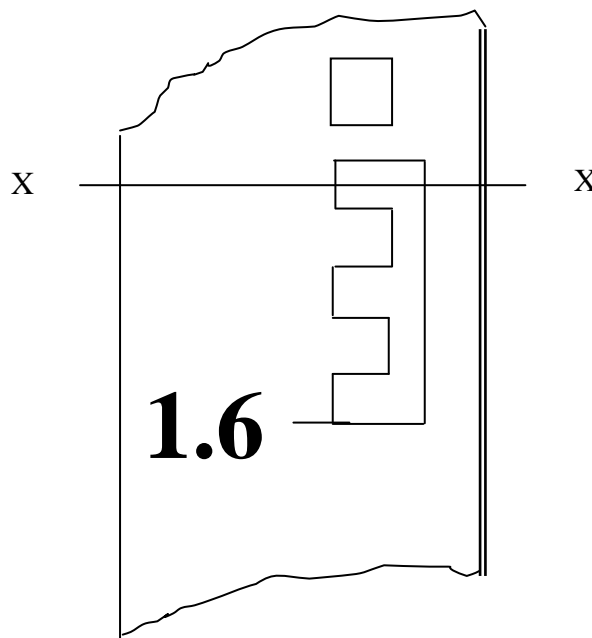


FIGURE 10

The reading of levelling staff is
Bacaan staf ukur aras tersebut adalah

.....

[1 mark]

23. Table 8 shows the name of workers and their work scope for a construction company.

Jadual 8 menunjukkan nama-nama pekerja dan bidang tugas mereka dalam sebuah syarikat pembinaan.

Name Nama	Work Scope Bidang Tugas
Hamzah	Making estimation or costing for a given project. <i>Membuat taksiran atau anggaran kos bagi sesebuah projek.</i>
Ahmad	Executing construction work and supervision; and designing for a smaller scope. <i>Menjalankan kerja-kerja penyeliaan dan pengawasan, membuat reka bentuk untuk skop kecil.</i>
Lee	Preparing building design or architectural project. <i>Menyediakan reka bentuk bangunan atau seni bina projek.</i>
Rajah	Preparing engineering designs, solving problems related to construction technology. <i>Menyediakan reka bentuk kejuruteraan, menyelesaikan masalah yang berkaitan dengan teknologi pembinaan.</i>

Table 8

State the type of work for each worker.

Nyatakan pekerjaan untuk setiap pekerja:

- a) Hamzah :
- b) Ahmad :
- c) Lee :
- d) Rajah :

[4 marks]

24. The following shows the types of tender offered before a project is implemented.
Berikut menunjukkan jenis-jenis tawaran yang dikemukakan sebelum sesuatu projek dapat dilaksanakan.

Open tender <i>Tawaran Terbuka</i>	Limited Tender <i>Tawaran Terhad</i>
Pre-qualified tender <i>Tawaran Pra-kelayakan</i>	Selective tender <i>Tawaran Terpilih</i>

By referring to Table 9, match each tender with the suitable description.
Dengan merujuk Jadual 9, padankan jenis tawaran dengan pernyataan yang sesuai.

Description <i>Keterangan</i>	Tender Type <i>Jenis Tender</i>
Limited to Bumiputra contractors according to class <i>Dihadkan kepada kontraktor Bumiputera mengikut kelas.</i>	
Open to all Bumiputra and non-Bumiputra contractors. <i>Dibuka kepada semua kontraktor Bumiputera dan bukan Bumiputera.</i>	
Usually awarded to contractors with high expertise, experience, financial security and excellent management record. <i>Biasanya diberikan kepada kontraktor yang mempunyai kepakaran tinggi, berpengalaman, kewangan kukuh dan rekod pengurusan yang cemerlang.</i>	

Table 8

[3 marks]

25. Figure 11 shows a part of wooden wall frame.
Rajah 11 menunjukkan sebahagian daripada bingkai dinding kayu.

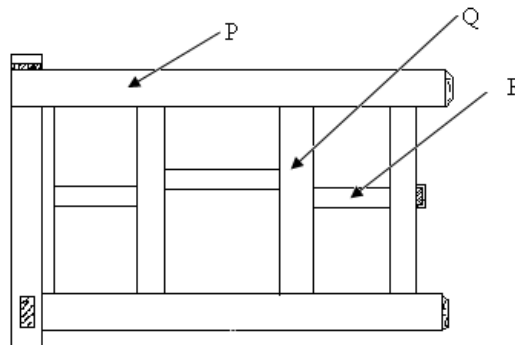


Figure 11

Name the parts labelled as P, Q dan R.
Namakan bahagian yang berlabel P, Q dan R.

- P :
 Q :
 R :

[3 marks]

26. Table 10 shows the description of working drawings.
Jadual 10 menunjukkan pernyataan tentang jenis-jenis lukisan kerja.

Tick (✓) for **true** statements and cross (X) for **false** statements in the boxes provided.

Tandakan (✓) bagi pernyataan yang benar dan (X) bagi pernyataan yang salah pada ruang yang disediakan.

Statement <i>Pernyataan</i>	Answer <i>Jawapan</i>
Engineering survey drawing is to show the location of the construction structure. <i>Lukisan ukur kejuruteraan adalah untuk menunjukkan lokasi pembinaan struktur.</i>	
Structure drawing is to show detailed reinforced concrete beam, type of steel used and their dimensions. <i>Lukisan struktur adalah untuk menunjukkan dengan lengkap rasuk konkrit bertetulang, jenis keluli digunakan dan ukuran.</i>	
Architecture drawing is to show various view and sectional which shown a physical shape, size, material, road and piping. <i>Lukisan arkitek menunjukkan beberapa pandangan dan keratan yang menunjukkan bentuk fizikal, saiz, bahan, ukuran bahan, jalan dan talian paip.</i>	

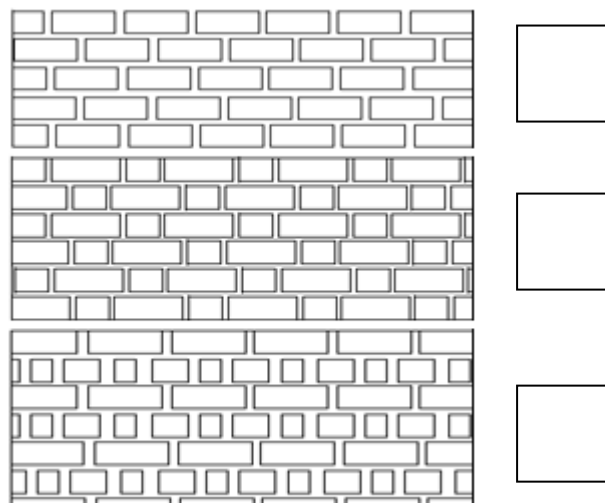
Table 10

[3 marks]

27. The following are shows types of brick wall bonding method
Berikut menunjukkan jenis kaedah ikatan bata dinding.

A. Stretcher bond	B. Flemish bond
C. English bond	D. English yard bond

Match the name of brick wall bonding by writing A, B, C or D in the spaces provided.
Padankan nama ikatan bata dengan menulis A, B, C atau D pada ruang yang disediakan.



[3 marks]

28. State forces X and Y shown in Figure 12.
 Nyatakan daya X dan Y yang ditunjukkan pada Rajah 12.

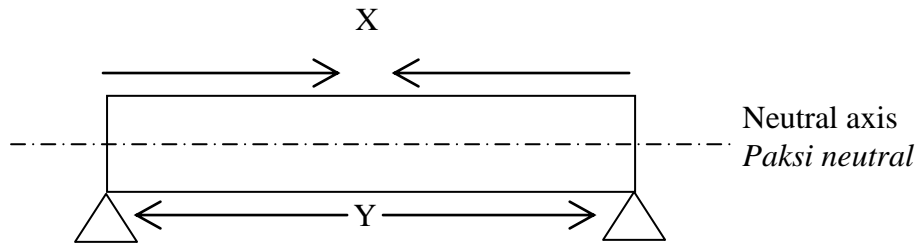


Figure 12

X :
 Y :

[2 marks]

29. Table 11 shows the symbols used in the design operation and the meaning of the symbol.
 Tick (✓) for the **correct** pairs and cross (X) for the **wrong** pairs in the space provided.

Jadual 11 menunjukkan simbol-simbol yang digunakan dalam operasi reka bentuk serta maksud simbol.
 Tandakan (✓) untuk pasangan yang **betul** dan (X) untuk pasangan yang **salah** pada ruang yang disediakan.

Symbol <i>Simbol</i>	Meaning <i>Maksud</i>	Answer <i>Jawapan</i>
	Process is executed <i>Proses sedang dilaksanakan</i>	
	The start or end of the process <i>Proses mula atau tamat</i>	
	Process stop momentarily <i>Proses berhenti seketika</i>	
	Decision must be made <i>Keputusan perlu dibuat</i>	

Table 11

[4 marks]

30. Table 12 shows two sources of information which could be used in a design process. Complete the table in the spaces provided.

Jadual 12 menunjukkan dua sumber maklumat yang boleh digunakan dalam proses reka bentuk.

Lengkapkan jadual tersebut pada ruang yang disediakan.

Print media <i>Media cetak</i>	Electronic media <i>Media elektronik</i>
Newspaper <i>Surat khabar</i>	Television <i>Televisyen</i>
(i).....	(i).....
(ii).....	(ii).....

Table 12

[4 marks]

31. Table 12 shows three types of input wave which throughout three types of electronic components. Draw an output wave.

Jadual 12 menunjukkan 3 jenis gelombang masukan yang akan melalui 3 jenis komponen elektronik. Lukiskan gelombang keluaran.


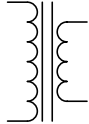
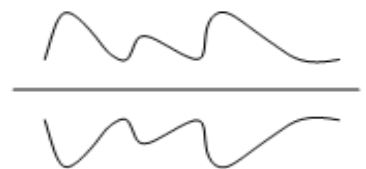
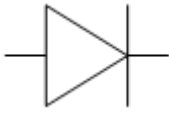
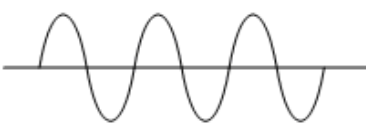
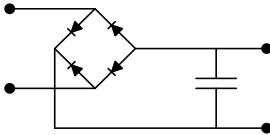
Input Wave <i>Gelombang Masukan</i>	Electronic Components <i>Komponen Elektronik</i>	Output Wave <i>Gelombang Keluaran</i>
		
		
		

Table 12

[3 marks]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

SULIT

3764/1

NAMA : Tingkatan :

SULIT

3764/1

Teknologi

Kejuruteraan

Kertas 1

Ogos

2010

1 ½ jam



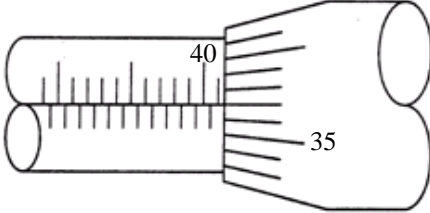
**BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KLUSTER
KEMENTERIAN PELAJARAN MALAYSIA**

**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2010**

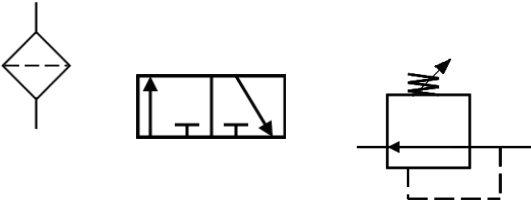
TEKNOLOGI KEJURUTERAAN

**MARKING SCHEME
P1**

**ENGINEERING TECHNOLOGY
PAPER 1
MARKING SCHEME**

QUESTION NUMBER	DESCRIPTIONS	MARKS
1	A D B E C	1 1 1 1 1 5
2		2 2
3	(i) For quick filing of soft workpiece (ii) For general work/ quick filing (iii) For filing soft metals (iv) For finishing work	1 1 1 1 4
4	3 1 2	1 1 1 3
5	A C B	1 1 1 2
6	Boring Taper turning Straight turning Facing	1 1 1 1 4
7	3 4 5 2	1 1 1 1 4
8	Between human and machine Between machines Between machine and human	1 1 1 3
9	C A B D	1 1 1 4

10		1 1 1	3
11	i – (output is lower than input) ii – (positive cycle only) iii –	1 1 1	3
12	Y Z X	1 1 1	3
13	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> \checkmark \checkmark </div> <div style="text-align: center;"> \checkmark \checkmark </div> </div>	1 1 1 1	4
14	i) DC generator ii) A - Commutator B - Armature C – Magnetic field.	1 1 1 1	4
15	a) Power stroke and exhaust stroke b) i) ii) Fuel gas combusts and expand iii) Propulsion power is produced iv)	1 - 1 1 -	3
15	T R S P	1 1 1 1	4
17	$P_1 = P_2$ $F_1/A_1 = F_2/A_2$ $\frac{20}{\pi \left(\frac{D}{2}\right)^2} = \frac{F_2}{\pi \left(\frac{4D}{2}\right)^2}$ $F_2 = \frac{80}{\pi D^2} \times 4\pi D^2$ $= 320 \text{ N}$	1 1 1 1	4

18	<ul style="list-style-type: none"> i) Triac ii) Diode iii) Diac iv) SCR 	<ul style="list-style-type: none"> 1 1 1 	4
19	<ul style="list-style-type: none"> a) direct line starting circuit b) i) start press button ii) contactor c) becomes electromagnetic to pull the iron core and lever is called holding circuit 	<ul style="list-style-type: none"> 1 1 1 	4
20		<ul style="list-style-type: none"> 1 1 1 	3
21	<ul style="list-style-type: none"> i) get ii) anod iii) katod 	<ul style="list-style-type: none"> 1 1 1 	3
22	1.545 m	1	1
23	<ul style="list-style-type: none"> Hamzah - Quantity survey Ahmad - Technician Lee - Architect Rajah - Consultant 	<ul style="list-style-type: none"> 1 1 1 1 	4
24	<ul style="list-style-type: none"> limited tender open tender pre-qualified tender 	<ul style="list-style-type: none"> 1 1 1 	3
25	<ul style="list-style-type: none"> P = HEAD PLATE Q = STUDS R = NOGGING 	<ul style="list-style-type: none"> 1 1 1 	3
26	<ul style="list-style-type: none"> √ √ √ 	<ul style="list-style-type: none"> 1 1 1 	3
27	<ul style="list-style-type: none"> A B D 	<ul style="list-style-type: none"> 1 1 1 	3
28	<ul style="list-style-type: none"> X: compressive load Y: tensile load 	<ul style="list-style-type: none"> 1 1 	2
29	<ul style="list-style-type: none"> √ X X √ 	<ul style="list-style-type: none"> 1 1 1 1 	4

30	Printed media: Books, magazines, journals, articles, proceedings Electronic media: Internet, film, diskettes, CD-ROMs, Video, E- books, E-learning	Either two 2 X 1 2 X 1 4
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3764/2

Teknologi Kejuruteraan

Kertas 2

Ogos

2010

2½ jam



**BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KLUSTER
KEMENTERIAN PELAJARAN MALAYSIA**

**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2010**

**TEKNOLOGI KEJURUTERAAN
Kertas 2
Dua jam tiga puluh minit**

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Kertas soalan ini mengandungi **tujuh (7)** soalan.
2. Jawab **satu** soalan daripada **Bahagian A**, **satu** soalan daripada **Bahagian B** dan **semua** soalan daripada **Bahagian C**
3. Setiap soalan diperuntukkan 20 markah
4. Semua jawapan kepada **Bahagian A, B dan C** hendaklah ditulis pada kertas jawapan berasingan
5. Tulis nama penuh dan tingkatan pada setiap helaian kertas jawapan dan lampiran

Bahagian	Soalan	Markah Penuh	Markah Diperolehi
A	1	20	
	2	20	
B	3	20	
	4	20	
C	5	20	
	6	20	
	7	20	
Jumlah			/100

Kertas soalan ini mengandungi 12 halaman bercetak

Section A
Bahagian A

[20 marks]

Answer **one** question only.

Jawab satu soalan sahaja.

1. Figure 1 shows two mild steel components, Part A measuring 12 mm x 12 mm x 100 mm and Part B measuring 60 mm x 60 mm x 10 mm.

Rajah 1 menunjukkan dua komponen keluli lembut, Bahagian A berukuran 12 mm x 12 mm x 100 mm dan Bahagian B berukuran 60 mm x 60 mm x 10 mm.

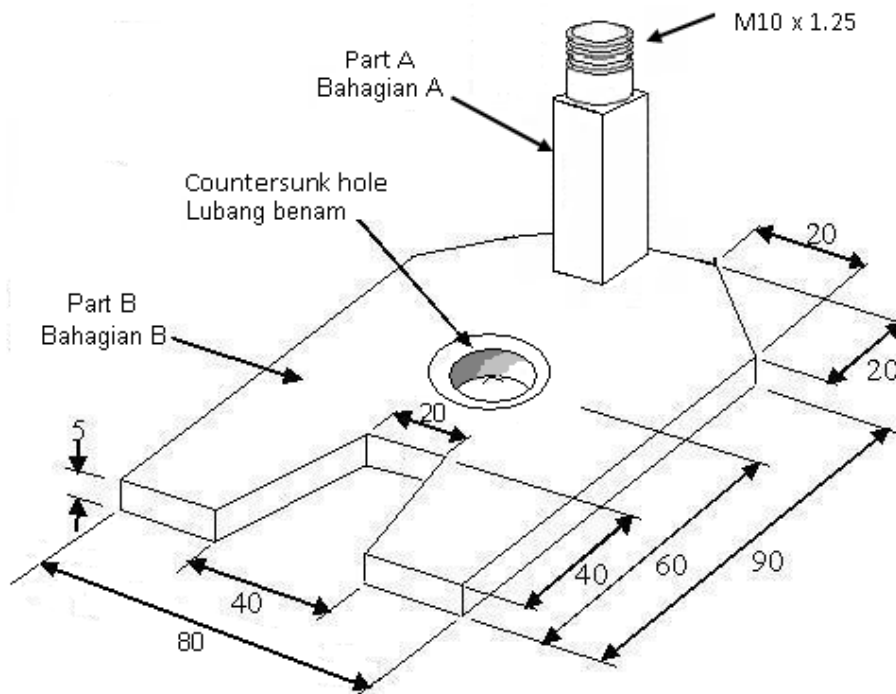


Figure 1
Rajah 1

- (a) Explain the steps needed to produce the thread M10 x 1.25 in Part A.
Terangkan langkah-langkah yang diperlukan untuk menghasilkan ulir M10 x 1.25 pada Bahagian A. [8 marks]
[8 markah]
- (b) List two hand tools used to make Part B.
Senaraikan dua alat tangan yang digunakan untuk membuat Bahagian B. [2 marks]
[2 markah]
- (c) With the aid of sketches, describes the arc welding steps to joint part A and Part B.
Dengan bantuan lakaran, huraikan langkah-langkah kerja kimpalan arka untuk menyambungkan Bahagian A dan Bahagian B. [10 marks]
[10 markah]

SULIT

2. Figure 2 shows a block diagram of **AM receiver system**.
Rajah 2 menunjukkan gambar rajah blok bagi sistem penerima AM.

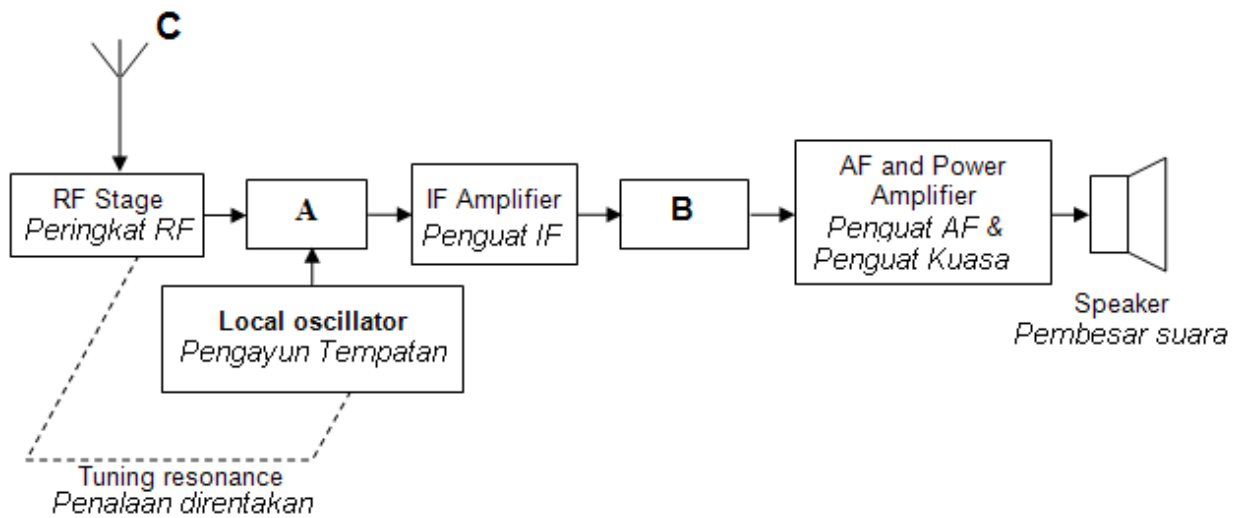


Figure 2
Rajah 2

- a) i) **Name** the blocks labeled **A** and **B**.
Namakan blok yang berlabel **A** dan **B**. [2 marks]
[2 markah]
- ii) What will happen if there is a failure in block **C**?
*Apa yang akan berlaku sekiranya blok **C** mengalami kerosakan?* [2 marks]
[2 markah]
- b) Based on Figure 2, **explain** the operating of AM receiving system
Berpandukan Rajah 2, terangkan kendalian sistem penerima AM itu. [6 marks]
[6 markah]

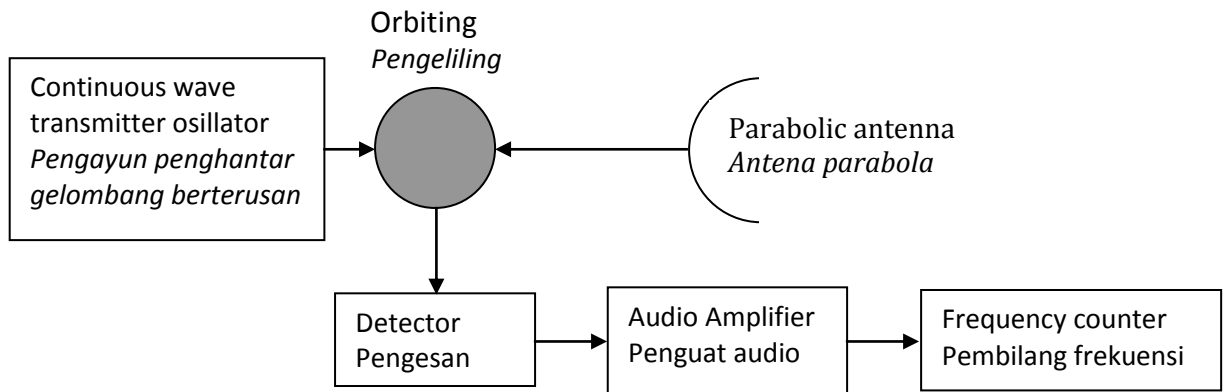


Figure 3
Rajah 3

- c) Figure 3 shows a radar system block diagram.
Rajah 3 menunjukkan rajah blok satu sistem radar.
- i) State two functions of radar .
Berikan dua fungsi bagi radar. [2 marks]
[2 markah]
- ii) What is the function of orbital block ?
Apakah fungsi blok pengeliling ? [2 marks]
[2 markah]
- d) Based on Figure 3, explain the operating of continuous wave radar system.
Berpandukan Rajah 3, terangkan kendalian sistem radar gelombang penuh.. [6 marks]
[6 markah]

Section B
Bahagian B

[20 marks]

Answer **one** question only.

Jawab satu soalan sahaja.

- 3 a) Use **Appendix 1** on page 15 to answer this question.
*Gunakan **Lampiran 1** pada halaman 15 untuk menjawab soalan ini.*
Complete the Soil Sieve Analysis Data Table, if the weight of soil sample is 200g.
Lengkapkan Jadual Data Analisis Ayakan Tanah itu, jika berat sample tanah ialah 200 g.
[12 marks]
[12 markah]
- b) Use **Appendix 2** on page 17 to answer this question.
*Gunakan **Lampiran 2** pada halaman 15 untuk menjawab soalan ini.*
Based on answer 3(a), plot the particle size distribution graph.
Berdasarkan jawapan 3(a), plot graf taburan saiz kumin.
[8 marks]
[8 markah]

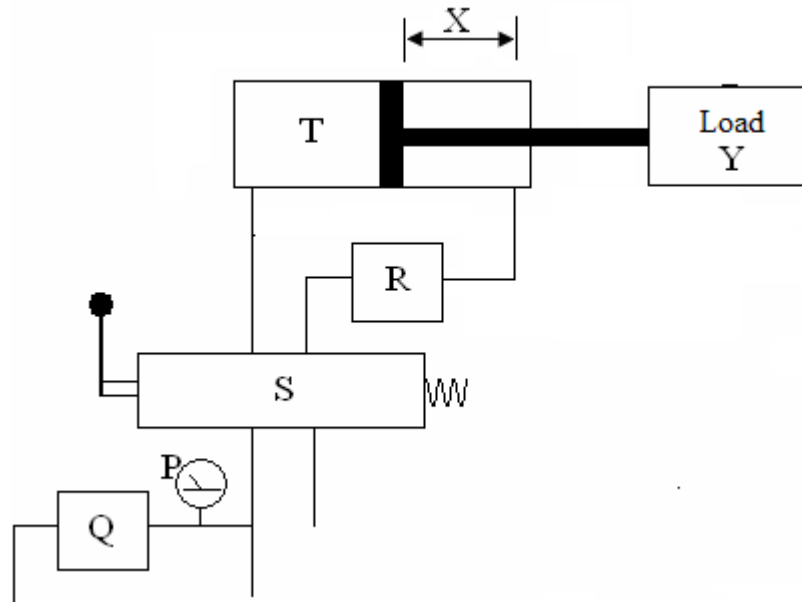


Figure 4
Rajah 4

4. Figure 4 shows a schematic circuit hydraulic system that is not complete to push load Y. A cross sectional area of piston is 1600 mm^2 and its movement is under control. The distance of X is 200 mm.

Rajah di bawah menunjukkan litar skematik sistem hidraulik yang tidak lengkap bertujuan untuk menolak beban Y.

Keratan rentas omboh ialah 1600 mm^2 dan sesaran pergerakannya adalah terkawal. Jarak X ialah 200 mm.

- a) i) Calculate the force of Y if the reading of P is 2.0 KPa.
Hitung Daya Y jika bacaan P ialah 2.0 KPa. [4 marks]
[4 markah]
- ii) If the time taken for the piston rod to move in the cylinder T is 5 second, calculate the power used.
Jika masa yang diambil oleh rod omboh bergerak didalam silinder T ialah 5 saat, hitungkan kuasa yang digunakan. [6 marks]
[6 markah]
- b). Nyatakan mod kendalian bagi S
State the function operation for S. [2 marks]
[2 markah]
- c) Complete the schematic circuit where piston can be stopped at X and name the parts of Q, R, and S.
Lengkapkan litar skematik itu dimana omboh boleh dihentikan pada kedudukan X dan Namakan bahagian-bahagian Q, R dan S [8 marks]
[8 markah]

Section B
Bahagian B

[20 marks]

Answer **all** questions only.

Jawab semua soalan sahaja.

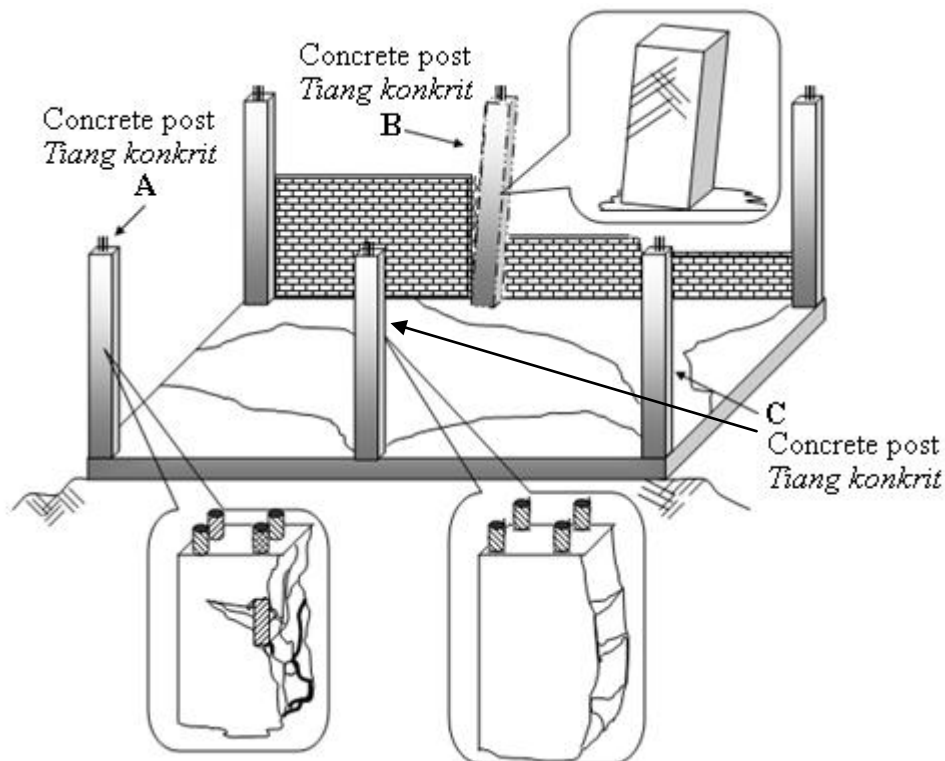


Figure 5
Rajah 5

5. Figure 5 shows the construction of six reinforcement concrete columns. When the formworks are removed, the deflection occurred in three columns as shown in parts A, B and C.
Rajah 5 menunjukkan pembinaan 6 tiang konkrit bertetulang.. Apabila kotak acuan ditanggalkan, didapati 3 tiang konkrit mengalami kecacatan seperti yang ditunjukkan pada bahagian A, B dan C.

- a) i) Describe **two** working processes that cause the problem for every defect at A, B, and C.
*Terangkan **dua** proses kerja yang menyebabkan berlakunya masalah bagi setiap kecatatan tiang konkrit A,B dan C itu.* [6 marks]
[6 markah]
- ii) Explain **two** working processes of concrete preparation before placing into the formwork.
*Terangkan **dua** proses penyediaan konkrit sebelum dituang ke dalam kotak acuan tiang di atas.* [4 marks]
[4 markah]

SULIT

b) Explain the steps needed in frame work construction for one concrete post.

Sketch a diagram to support your answer.

Terangkan langkah-langkah yang diperlukan untuk kerja acuan bagi satu tiang konkrit.

Lakarkan gambar rajah untuk membantu jawapan anda.

[7 marks]

[7 markah]

c) State **three** timber work tools in frame work process.

*Nyatakan **tiga** alatan kerja kayu dalam proses kerja acuan.*

[3 marks]

[3 markah]

SULIT

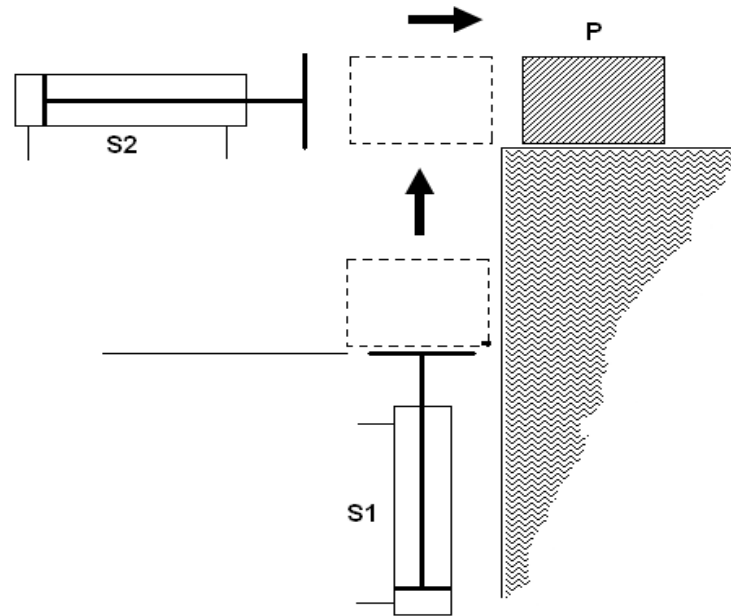


Figure 6
Rajah 6

6. Figure 6 shows a hydraulic system function to lift up the heavy parts.
Rajah 6 menunjukkan satu sistem hidraulik untuk mengangkat beban berat.

a) Name the types of cylinder S1
Namakan jenis selinder S1

[2 marks]
[2 markah]

b) Use Appendix 3 to answer this question.
Gunakan Lampiran 3 untuk menjawab soalan ini.

Based on Figure 6, complete the schematic diagram of hydraulic system to push the heavy product P upward and rightward so that its rest onto situated place. The movements of the cylinder rod are based on the following characteristics:
Berdasarkan Rajah 6, lengkapkan litar skematik sistem hidraulik itu untuk menolak beban P ke atas dan ke kanan. Kriteria gerakan adalah seperti berikut

- The speed of both pistons to push the product can be controlled and to backward are normal.
Kelajuan gerakan kedua-dua piston boleh dikawal dan gerakan balik adalah normal.
- S1 and S2 are control separately.
S1 dan S2 dikawal berasingan
- The movement of both cylinders can be stopped anywhere.
Pergerakan kedua-dua selinder boleh dihentikan dimana-mana.

[14 marks]
[14 markah]

c) State **four** factors that will be effected to the pressure of the fluid in a pipeline.
Nyatakan empat factor yang mempengaruhi tekanan bendalir di dalam paip.

[4 marks]
[4 markah]



Figure 7
Rajah 7

7. Figure 7 shows a children's bicycle that was designed by a group of engineering students.
Rajah 7 menunjukkan sebuah basikal kanak-kanak yang direka oleh sekumpulan pelajar kejuruteraan.
- a) State three criteria that should be considered during designing other than the human factor
Nyatakan tiga kriteria yang perlu dipertimbangkan semasa mereka bentuk selain daripada faktor manusia. [6 marks]
[6 markah]
- b) Explain three ergonomics human factor and why the factors are important in designing.
Terangkan 3 faktor manusia (ergonomik) dan mengapa faktor tersebut penting semasa membuat reka bentuk. [6 marks]
[6 markah]
- c) After testing the finished prototype, the texture of the bicycle seat was not suitable..
Setelah diuji didapati tekstur tempat duduk basikal itu tidak sesuai.
- i) State the criteria that the designer need to reconsider in the seat design.
Nyatakan kriteria yang perlu dipertimbangkan kembali. [2 marks]
[2 markah]
- ii) Suggest some modification to overcome the problem of the seat.
Cadangkan pengubahsuaian untuk mengatasi masalah tersebut. [2 marks]
[2 markah]
- d) Explain with the aid of sketches, one method that will improve the comfort of the children when riding it on a rough surface road.
Terangkan dengan bantuan lakaran, satu kaedah untuk menambah keselesaan pengguna apabila melalui jalan yang kasar [4 marks]
[4 markah]

IC NO./NO. K P

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INDEX NO.
ANGKA GILIRAN

--	--	--	--	--	--	--	--	--	--	--

Soil Sieve Analysis Data
Data Analisis ayakan Tanah

Sieve size Saiz ayak (m)	Sieve weight Berat ayak (g)	Sieve weight + Soil Berat ayak + Tanah (g)	Soil weight retained Berat tanah yang tertinggal (g)	Soil weight passing Berat tanah yang melewati (g)	Percentage passing Peratus melempi (%)
3.35	532.43	538.23			
2.36	511.6	522.1			
1.18	496.82	519.62			
0.425	473.15	528.35			
0.300	459.15	476.12			
0.212	441.67	463.07			
0.150	417.58	436.18			
0.075	399.61	421.71			
0.063	382.05	387.65			
Pass Melempi 0.063	369.57	374.27			
Total weight Jumlah berat					
Weight loss Kehilangan berat					

(To be used to answer Question 3(a))
(Digunakan untuk menjawab Soalan 3(a))

IDENTITY CARD NO.
NO. KAD PENGENALAN

INDEX NO.
ANGKA GILIRAN

Appendix 2
Lampiran 2

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		PARTICLE SIZE DISTRIBUTION																						
		HYDROMETER						SIEVE																
		SILT			SAND			GRAVEL																
		FINE	MEDIUM	COARSE	FINE		MEDIUM	COARSE	FINE		MEDIUM	COARSE												
					0.063	0.075	0.150	0.212	0.300	0.425				1.180	2.360	3.360								
% Cumulative Total	100																							
	90																							
	80																							
	70																							
	60																							
	50																							
	40																							
	30																							
	20																							
	10																							
		0	0.001	0.002	0.005	0.01	0.02		0.06	0.1	0.2			0.6	1	2		5		10	20		80	
		Soil mass that passed through the sieve																						

SULIT

3764/2
Teknologi Kejuruteraan
Kertas 2
Ogos
2010
2½ jam



**BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KLUSTER
KEMENTERIAN PELAJARAN MALAYSIA**

**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2010**

TEKNOLOGI KEJURUTERAAN

MARKING SCHEMA P2

Kertas soalan ini mengandungi 12 halaman bercetak

MARKING SCHEME
PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2010
ENGINEERING TECHNOLOGY
PAPER 2
 Marking scheme

Quest No	Descriptions	Marks
1 a)	1. Sediakan acuan logam asas corak lilin	1m
	2. suntik lilin cair ke dalam acuan logam asas	1m
	3. bahagian-bahagian corak lilin ini dipasangkan pada spru bagi membentuk corak akhir yang dikehendaki	2m
	4. corak yang telah terbina itu dimasukkan ke dalam kotak acuan dan dibiarkan mengeras	2m
	5. bahan campuran seramik akan dituangkan dalam kotak acuan dan dibiarkan mengeras	2m
	6. kotak acuan kemudiannya dipanaskan sehingga lilin cair dan mengal keluar. Bekas lilin akan membentuk corak acuan sebenar yang dikehendaki	2m
	7. logam lebur akan dituangkan ke dalam spru sehingga memenuhi semua rongga bekas lilin tadi	2m
	8. setelah logam lebur mengeras, kotak bekas bahan campuran seramik akan dipecahkan bagi mengeluarkan produk yang dikehendaki	2m
	Jumlah	14m
1 b)	Kebaikan <ul style="list-style-type: none"> - kejituan tinggi - tak perlu kemasan setelah siap - bebas kecacatan - boleh bentuk barangan yang kompleks dan rumit - boleh hasilkan produk yg nipis dan berlubang-lubang Mana-mana 2x1m = 2 markah	2m
	Keburukan <ul style="list-style-type: none"> - acuan boleh diguna sekali sahaja - pembinaan acuan dan menyiapkan barangan lambat - perlu kemahiran tinggi - barangan saiz kecil sahaja - kos bahan dan upah tinggi Mana-mana 2x1m = 2 markah	2m
1 c)	i) aloi zink	
	ii) aluminium aloi 2x1m = 2 markah	2m
	Total	20m

2 a)	i) A – Modulator / mixer B – Detector	1m 1m
	ii) Cannot received the broadcast signal / weaker signal is received	2m
2 b)	i. Antenna received the broadcasting signal from transmitter ii. RF stage tuned up the required signal and amplified the signal iii. RF Stage channeled the selected signal to the mixer (modulator) iv. Local oscillator is produced the local radio frequency for heterodyne Process and channeled to mixer. v. Carry out heterodyne process where the received carrier signal is convert into intermediate frequency (IF) – 470 kHz. vi. IF Amplifier amplifies the intermediate frequency to the range that can be detect by the detector vii. The detector carries out the detection process to produce the original signal viii. The Audio Amplifier circuit amplifies the audio signal ix. The speaker converts the audio / electric signal into sound (voice)	6m
	6 X 1m (maximum 6m)	
2 c)	i. - To detect the object. - To detect the speed of moving abject	1m 1m
	ii. Functioning to separate the received and transmitted wave	2m
2 d)	i. The continuous transmitter oscillator generates the continuous wave and which is transmitted in atmosphere. ii. The continuous wave is the channeled the orbital iii. The orbital is then channeled the wave to parabolic antenna. iv. The signal is detect the target object v. The antenna is received the reflection wave vi. The orbital is used channeled the received wave and channeled to the detector block. vii. The detector is processed the signal from continuous wave transmitter oscillator and the received reflection wave. viii. The result is <i>Doppler Frequency</i> and then is channeled to the audio amplifier block. ix. The audio amplifier block amplified the signal from detector and then channeled to frequency counter block. x. The frequency counter valued the <i>Doppler Frequency</i> and displays the result.	6m
	6 X 1m (maximum 6m)	

Grand Total 20m

3 a)	Column Soil weight retained	any 4 corrects X 4	4m
	Column Soil weight passing	any 3 corrects X 3	3m
	Percentage passing	any 3 corrects X 3	3m
	Total weight		1m
	Weight lost		1m
		Total	12m
3 b)	Coordinates	any 4 corrects X 4	4m
	Curve produces - Joining coordinates	any 4 corrects X 4	4m
		Total	8m
		Grand Total	20m

Sieve size <i>Saiz ayak</i> (m)	Sieve weight <i>Berat ayak</i> (g)	Sieve weight + Soil <i>Berat ayak +</i> <i>Tanah</i> (g)	Soil weight retained <i>Berat tanah yang</i> <i>tertinggal</i> (g)	Soil weight passing <i>Berat tanah yang</i> <i>melepassi</i> (g)	Percentage passing <i>Peratus melepassi</i> (%)
3.35	532.43	538.23	5.8	177.87	97
2.36	511.6	522.1	10.5	167.37	91
1.18	496.82	519.62	22.8	144.57	79
0.425	473.15	528.35	55.2	89.37	49
0.300	459.15	476.12	16.97	72.4	39
0.212	441.67	463.07	21.4	51.0	28
0.150	417.58	436.18	18.6	32.4	18
0.075	399.61	421.71	22.1	10.3	6
0.063	382.05	387.65	5.6	4.7	3
Pass <i>Melepassi</i> <i>0.063</i>	369.57	374.27	4.7		
Total weight <i>Jumlah berat</i>			183.67		
Weight loss <i>Kehilangan</i> <i>berat</i>			16.33		

4 a) i.) $F = p A$
 $p = 2 \text{ Kpa} = 2\,000 \text{ pa}$
 $A = 1600 \text{ mm}^2 = 1.6 \times 10^{-3} \text{ m}^2$

Beban Y

$F = pA$
 $F = 2\,000 \times 1.6 \times 10^{-3}$
 $= 3.2 \text{ N}$

Penandaan: Formula = 1m
 Pengiraan = 2m
 Jawapan = 1m

4m

ii) Kuasa

Kerja, $W = F \times d$
 $= 3.2 \text{ N} \times 0.2 \text{ m}$
 $= 0.64 \text{ J} @ 0.64 \text{ Nm}$

Kuasa, $P = W / t$
 $= 0.64 / 5$
 $= 0.128 \text{ W} @ 0.128 \text{ Nm/s}$

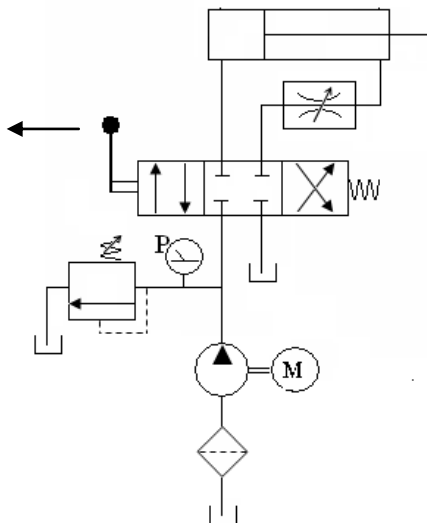
Penandaan
 formula = 2 X 1m = 2m
 Pengiraan = 2m
 Jawapan = 2m

6m

4 b) TUIL (lever) / Insani (manual)

2m

4 c)



Penandaan
 Semua sambungan betul = 2 X 1m
 Q, R symbol betul = 2 X 1m
 Komponen S betul = 2 m
 Punca sambungan pada komponen = 2 X 1m

8m

Grand total 20m

5 a) i)

Problem A

1. Not compacting process / not enough compacting **2m**
2. Wrong placing concrete / High placement does not exceed 1.2m
3. Wrong concrete mix – not evenly mix

Problem B

1. Formwork not perpendicular – not used spirit level as formwork process **2m**
2. Without temporary support of formwork
3. Formwork kicker broken / crash

Problem C

1. Plywood / board / plank broken **2m**
2. Yoke / nuts / steel bar loosen
3. Wedge loosen

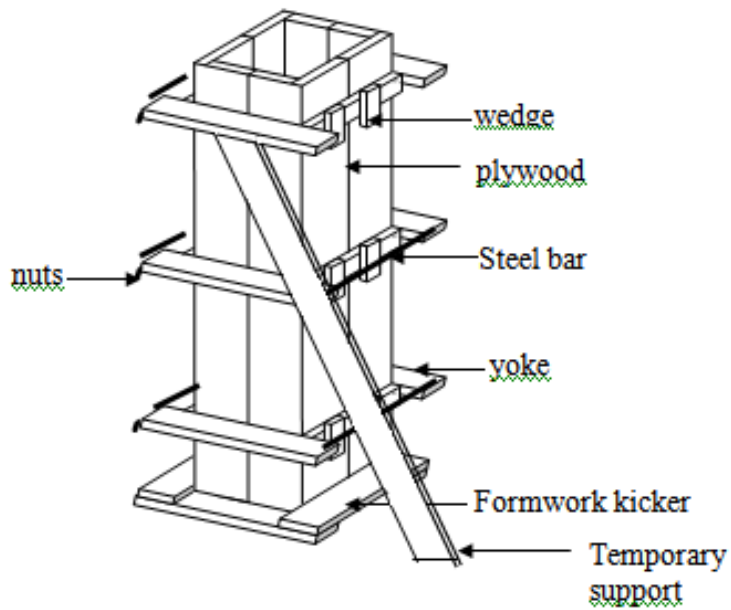
ii) Concrete Preparation

1. Concrete mixture ratio – example 1: 2 :4 **2m**
Water cement ratio – example 0.5
Concrete mix – manual or mixer machine **2m**

5 b) Steps of formwork construction.

- i. Measure the size of concrete post / width and height.
- ii. Prepare the plywood / plank and batten wood.
- iii. Apply the plywood / plank to be shape the box
- iv. Apply the formwork kicker positioning batten
- v. Apply the yoke / placed 3 or more for one column.
- vi. Placed the steel bar / place the wedge between plank and steel bar.
- vii. Placed nuts with noggin
- viii. Apply spirit level / placed the temporary support.

5m



2m

Constructions tools (timber work)

5 b)

- i. Claw hammer
- ii. Crosscut saw
- iii. Spirit level
- iv. L square

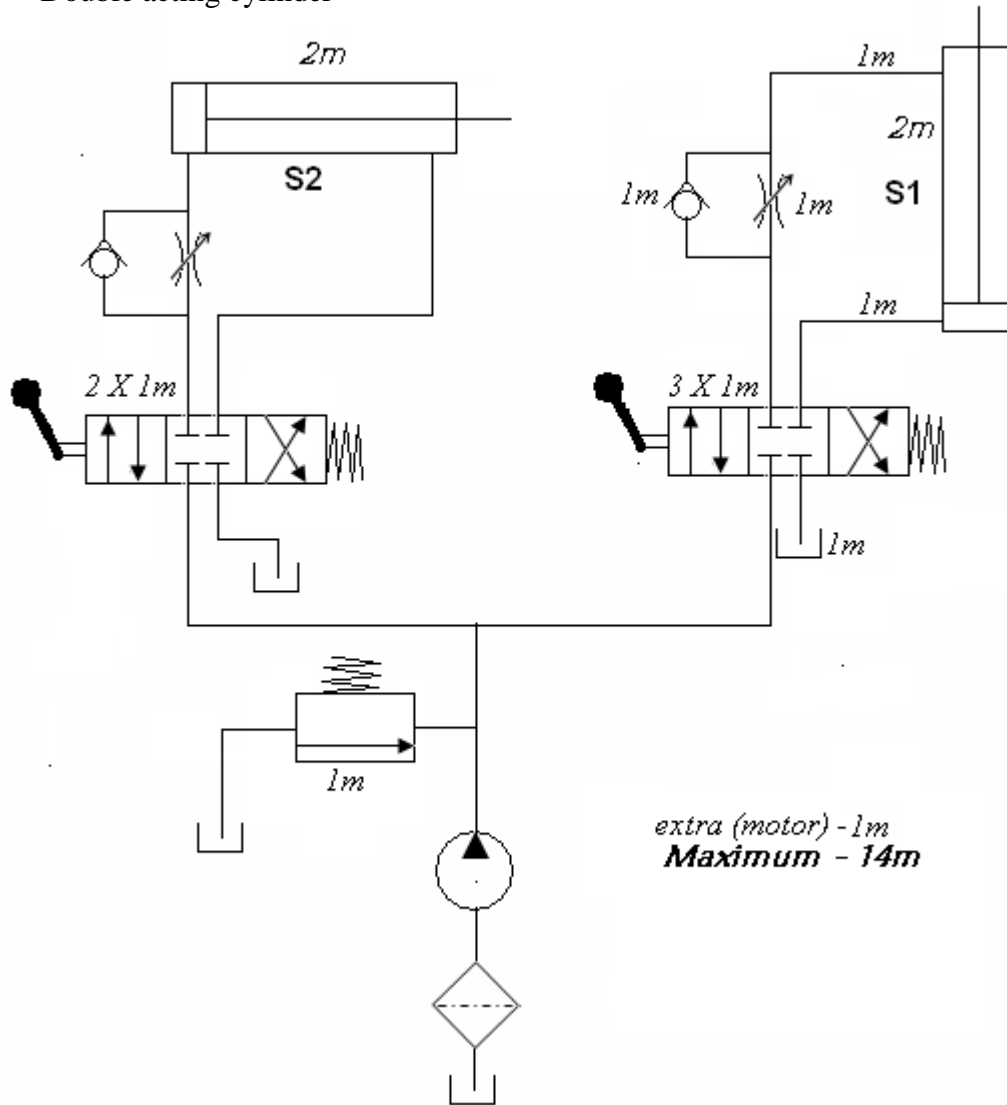
Grand Total **3m**

20m

6 a) Double acting cylinder

2m

6 b)



14m

6 c)

- i. Pipe too long
- ii. Pipe too small
- iii. Too many joints
- iv. Too many bend
- v. Liquid too dense

4 X 1m (maximum 4 marks)

4m

Grand total 20m

7 a)	<ul style="list-style-type: none"> - Function factor - Aesthetic factor - Strength factor 	<p>2m</p> <p>2m</p> <p>2m</p>
7 b)	<ul style="list-style-type: none"> - Body and human movement. - Safety - Growth and age level - Need of disable and eiderly people - Movement - Vision and colour 	<p></p> <p></p> <p></p> <p></p> <p></p> <p></p> <p>Factor - 3 X 1m</p> <p>Explanation - 3 X 1m</p> <p>6m</p>
7 c)	<p>i) Shape – suitable to children body</p> <p>Size – children age level</p> <p>Function – suitable seat for children to sit on it</p> <p>Safty – the seat is safe to use</p> <p>Vision and colour – interesting</p> <p>Adjustable – user is ease to set the suitable hight according to child age level.</p> <p>Taxture – comfortable</p> <p>Strength – suitable to children</p>	<p></p> <p></p> <p></p> <p></p> <p></p> <p></p> <p></p> <p></p> <p>Factor - 1m</p> <p>Explanation - 1m</p> <p>2m</p>
	<p>ii) Change the shape design and use soft material</p>	<p>2m</p>
7 d)	<p>Explanation (type of whell, using bearing)</p> <p>Sketch diagram</p>	<p>- 2m</p> <p>- 2m</p> <p>4m</p>
Grand total		20m