

**Nanyang Technological University**

**Semester 1 Examination 2015-2016**

**CV0002 – Engineers and Society**

**November/December 2015**

**PYP Solution, Done By: Sabrina Woo**

**Section A (Compulsory):**

1. (a) i
- (b) ii
- (c) iii
- (d) ii
- (e) iv
- (f) i
- (g) iii
- (h) iii
- (i) i
- (j) ii

**Section B (Answer any two questions):**

2(a).

- Settlers in US were extremely utilitarian – dissenters from established churches.
- Saw knowledge as a commodity to satisfy human needs – a frontier spirit of inventiveness
- American entrepreneurs designed industrial equipment that reduced their dependence on labour
- American engineers took the lead in machine shop techniques to develop effective grinding and milling machines
- American system of manufacture was characterised by highly standardized products of interchangeable parts.
- The early American Republic leaders recognized the need to encourage domestic manufacture, especially basic military equipment.
- Expansion of American railroads opened up national markets for machine tools.

Lesson learnt: Ability to think ahead, self-sufficiency

2(b).

Singapore's small population and hence its limited pool of local Research Scientists and Engineers (RSEs) requires a multi-pronged approach to be adopted for its manpower development, namely:

- 1) The Grooming of Local R&D Manpower
- 2) The Reliance on Foreign Talents
- 3) Internationalization

#### 1) The Grooming of Local R&D Manpower

- Measures to boost the local pool of researchers include raising the profile of RSEs and the R&D career so that more local talents will take up R&D jobs. A holistic approach will be adopted to address the entire spectrum of R&D manpower development.
- Primary Education – cultivate an interest in science and to participate in the Tan Kah Kee Young Inventors' Award.
- Secondary / JC Education – encourage students to study hard sciences and engineering and to participate in the School Adoption Scheme with technological companies.
- Tertiary Education - encourage students to consider post-graduate studies in Science & Engineering. National Science Talent Search. NSTB/EDB Scholarships
- Post-graduate – promote the challenge and attractiveness of R&D careers, raise social recognition for R&D careers, and continuous upgrading & training of RSEs
- Career Progression – technical and management leadership

#### 2) The Reliance on Foreign Talents

Measures to attract foreign R&D manpower into Singapore include:

- Provision of scholarships for foreign students to undertake postgraduate studies in the local universities with a view to taking up R&D careers here in Singapore.
- Attractive terms and conditions for foreign RSEs to come to Singapore.
- Special programme to attract experienced first rate R&D leaders and research professors to enhance technology management and research capabilities, and to help attract bright foreign students.

#### 3) Internationalization

- To draw on the strengths of other countries and to place emphasis on international R&D collaborations. In this way, Singapore can expand its international space for technology co-development, particularly in the pre-competitive stages.

- Set up overseas R&D programmes/centres to augment Singapore's limited resource and talent base
- Encourage prominent overseas R&D centres and universities to set up branches/linkages in Singapore (helps to raise the profile of local developments), creating international awareness

2(c).

The Workplace Safety and Health Act cover the following:

- All workplaces, unless exempted
- Responsibilities of stakeholders
- Hazardous substances
- Machinery and equipment

WSH Act Coverage:

- The WSH initially covered the more high-risk industries.
- Six new sectors were covered in the expanded Workplace Safety and Health Act in March 2008. They included:
  - Services allied to the transport of goods, such as logistics, freight forwarding and cargo surveying services;
  - Landscape care and maintenance service activities, such as grass-cutting;
  - Water supply, sewerage and waste management, such as refuse disposal;
  - Hotels and restaurants;
  - Healthcare activities such as hospitals; and
  - Veterinary activities.
- Workplaces in these new sectors are expected to follow the key principles of the WSH Act that advocates reducing risks at source, increasing stakeholders' ownership and adopting a performance-based approach.
- The Act eventually covers all workplaces to ensure the safety and health of all workers since 2010.

The WSH Act has four Key Features:

It places responsibilities on **stakeholders** who have it within their control to ensure safety at the workplace.

It focuses on workplace safety and **health systems and outcomes**, rather than merely on compliance.

It facilitates effective enforcement through the issuance of **remedial orders**.

It imposes **higher penalties** for non-compliance and risky behaviour.

2(d).

Communism in Singapore:

- During the period 1945 - 1948 the MCP (Malayan Communist Party) was a legal organisation in Singapore & Malaya.
- The Communists took advantage of the post-war problems and started to stir up the people's feelings against the British. During that period, communism was synonymous with anti-colonialism. Communist movements in our neighbours have been heavily involved in subverting colonial rule.
- Strikes by trade unions were common. However, those workers who did not succeed in their strikes found themselves worse off. When the communists realised that they had failed to stir up anti-British feelings, they resorted to violent means. Many MCP members left the towns and went into the jungles.

The Emergency (1948 - 1960):

- During the first half of 1948, the Communists attacked the rubber plantations and tin mines in Malaya.
- In June 1948, a state of Emergency was declared in Malaya and Singapore after the Communist Party of Malaya launched an armed revolution to establish a communist republic.
- In December 1949 the Special Branch obtained the full list of the Singapore Town Committee (STC) through a planted informer, and conducted a raid on 1 May 1950. STC Vice Secretary Ah Har and three other committee members were arrested ... Later that month, 20 more MCP members were arrested. Seven months later, on 5 December, because of an alert Special Branch officer, STC Secretary Ah Chin and his assistant, Ho Seng, were caught ...the mass arrests caused the near collapse of the MCP's operations in Singapore.
- The British appointed Sir Gerald Templer as high commissioner and commander-in-chief in February 1952. Using near dictatorial powers, Templer broke the military power of the communists in two years, and by 1955, they were no longer a serious threat to the British. This allowed for independence ... and the proclamation of the Federation of Malaya in 1957.
- December 2014 is the 25th anniversary of the signing of the 1989 Haadyai Peace Agreements between the Communist Party of Malaya (CPM) and the governments of Malaysia and Thailand. The agreements marked the end of the CPM's four decade-long campaign of violence and subversion.

### Strikes in Singapore:

- After 1954 when it had become clear that the British were going to leave Singapore, the communists moved to obtain control of an independent government by legal means while continuing to foster disorders.
- The communists tried to gain control of some important unions. Through trade unions, they would be able to influence the workers and get them to go on strikes.
- In addition, the communists were able to make use of the students in Chinese schools because the schools were not under government control.
- Furthermore, the Chinese school students were unhappy with the British government because they were not given equal opportunities for the entrance to the University. Chinese school students, when they graduate, could not get well paid jobs.

3(a).

### **Leftists in the early years of PAP:**

- The PAP was formed on 21 November 1954 by Lee Kuan Yew, an English-educated middle-class professional lawyer who had returned from university education in the United Kingdom. He had a vision of full independence for Singapore, and was joined by Lim Chin Siong and Fong Swee Suan despite their ideological differences.
- In April 1955, Lim Chin Siong was elected as Assemblyman for the Bukit Timah constituency. Then 22 years old, he was and remained the youngest Assemblyman ever to be elected to office.
- At that time, the leftists found a legal route to power by joining the PAP.
- Organizers of the PAP had deliberately collaborated with the leftists in order to broaden the PAP's base among the Chinese majority.
- Lee Kuan Yew eventually accused Lim Chin Siong and his supporters of being Communists, though declassified British government documents later suggested that no evidence was ever found that Lim was a Communist.

### **Barisan Sosialis – a Now Defunct Political Party:**

The Barisan Sosialis (Malay for Socialist Front; Chinese: 社会主义阵线) is a former Singaporean left-wing political party formed on 29 Jul 1961, by left-wing members of the People's Action Party (PAP) and led by Dr Lee Siew Choh and Lim Chin Siong.

The party was formed when the leftist members of the PAP were dismissed by then party leader Lee Kuan Yew.

The key event leading to the breakup was the motion of confidence of the government in which many PAP assemblymen crossed party lines.

On 20 July 1961, the PAP called for an emergency Legislative Assembly meeting to debate on the motion of confidence of the Government. In the vote on the motion taken on 21 July, it won narrowly by one vote.

Together with six prominent left-leaning leaders from trade unions, the breakaway members established this new party. At the time of inception, it had popular support rivalling or even superseding that of the PAP. 35 of the 51 branches of PAP and 19 of its 23 organising secretaries went to the Barisan Sosialis.

### **Operation Coldstore 1963:**

Operation Coldstore was a security operation launched in Singapore on 2 February 1963 in which at least 111 anti-government left-wing activists were arrested and detained, including key members of the opposition political party Barisan Sosialis. Others arrested included newspaper editors, trade unionists and university students.

The operation, authorised by the Internal Security Council which comprised representatives from the British Colonial, Malaysian Federal and Singapore governments, was touted as an anti-Communist sting.

At that time, Singapore was a self-governing state under British rule; but was preparing for a merger with the Federation of Malaya to form the Federation of Malaysia in September 1963.

The leftists, led by Lim Chin Siong strongly opposed this merger and were challenging the government of Singapore headed by Lee Kuan Yew of the People's Action Party (PAP) in their endeavour to establish a socialist state.

Lim's faction broke away from the PAP in 1961 to form the Barisan Sosialis.

The Singapore Trade Union Congress, the dominant trade union at the time, was also split into two factions; the left-wings formed the Singapore Association of Trade Unions (SATU), while the pro-PAP faction formed the National Trade Union Congress (NTUC).

Those arrested were detained under the Internal Security Act. They were alleged to be involved in subversive activities aiming to establish a "Communist Cuba" in Singapore. The arrestees include:

Lim Chin Siong, secretary-general, Barisan Sosialis

S Woodhull, vice-chairman, Barisan Sosialis

Fong Swee Suan, secretary-general SATU and executive committee member, Barisan Sosialis

The Operation dealt a heavy blow to the Barisan Sosialis, just months before the 1963 general elections. (PAP won 37 out of the 51 seats, the Barisan Sosialis 13).

- SATU was deregistered after its leaders were arrested, and the NTUC became the main trade union in Singapore ever since. NTUC remains closely associated with the PAP, with many of its union leaders being PAP's members of parliament.

- Some claimed the events which led to the arrest of the members of the Barisan Socialist, branded as "communists", were in fact politically motivated, and were not ideological.

#### **Internal Security Act (ISA):**

The present Act was originally enacted by the Parliament of Malaysia as the Internal Security Act 1960, and extended to Singapore on 16 September 1963 when Singapore was a state of the Federation of Malaysia.

The use of the ISA is usually associated with the 1960s and especially, Operation Coldstore. Even in 1963, when the PAP won that election with 37 seats to the Barisan's 13, three of the newly elected Barisan MPs were detained and another two became refugees even before they stepped into the legislature. They remain political exiles till today.

3(b).

He can choose to refuse to obey his supervisor's instructions and inform the relevant authorities of the situation. This action is moral and legal as the action does not harm the environment and will not make him feel bad. But this is considered as whistle blowing and he may be deemed to be betraying his supervisor and company. He should consider internal whistle blowing first, but if the relevant personnel within the organisation refuse to do anything to alleviate the situation, then external whistle blowing should be considered, meaning that the proper external authorities should be informed. For the latter action, Ali should really think through before proceeding with that action as it will most likely cause a big commotion.

Another option that Ali has is to simply obey his supervisor's instructions and dump the used coolant into the drain against his conscience. Ali should know that this action is immoral and illegal as it will cause much harm to the environment and innocent people.

As a budding engineering student, Ali should know the commitment that engineers have towards the people and their safety. One of the fundamental principles of the NSPE Code of Ethics is to hold paramount the safety, health and welfare of the public. With this in mind, Ali should not pour the used coolant into the drain and should also try to persuade Santokh not to do so too. But if Santokh is still too stubborn and refuse, then that leaves Ali with no choice but to report this to the internal authorities in the company. If the internal authorities appear to cover up for Santokh, then Ali should practise external whistle blowing.

3(c).

### **Challenges for Malaysia as ASEAN Chair 2015:**

- Regional community building

Malaysia will preside over the organization during a critical the year in which it is expected to form an ASEAN Community (AC) by December 31, 2015. Even as observers are skeptical that the deadline will be met, Malaysia will help formulate the "post-2015" ten-year roadmap for this community-building from 2016 to 2025.

- Economic integration

Economic integration will also be at the forefront of Malaysia's chairmanship in 2015. Part of the agenda will center on the future of the ASEAN Economic Community (AEC), which aims to create a single market and production base. Malaysia will also help conclude negotiations for a Regional Comprehensive Economic Partnership (RCEP), which will be the world's largest free trade agreement grouping ASEAN, China, Japan, South Korea, India, Australia and New Zealand upon its completion by the end of 2015.

- Regional architecture

Malaysia must maximize the avenues for dialogues through multi-lateral platforms such as the East Asia Summit (EAS) and the ASEAN Regional Forum (ARF) to assert ASEAN neutrality. Malaysia as ASEAN Chair must craft the agenda to incorporate broader interests and take into account proposals from member states to garner greater contributions.

- Tensions in the South China Sea

Malaysia will hope that tensions in the South China Sea do not flare up again. Even though Malaysia is a claimant state, it has traditionally preferred dealing with the issue quietly to balance protecting its interests and preserving its relationship with Beijing. Yet as previous years have demonstrated, events on the water may divide ASEAN states or force the chair to issue a separate statement. Malaysia's much-touted capacity for "moderation" and conflict resolution may once again be tested.



3(d).

### **Some Negative Impacts on Singapore Economy:**

- **Vulnerable To External Shocks**  
Singapore's dependence on exports makes her vulnerable to negative economic conditions in other countries. If one of Singapore's trading partners were to experience a recession, demand for her exports would fall.
- **Vulnerable To Competition**  
While globalisation gives Singapore a bigger market for her exports, it also means that she could face more competition. If exports decrease due to competition from low-cost countries, it will result in a fall in aggregate demand (AD), which would lead to a drop in output.
- **Vulnerable To Global Business Shifts**  
Increases in Singapore's productive capacity brought about by globalisation might not be permanent because she is highly reliant on MNCs which are by nature internationally mobile. They could shift operations to a lower-cost location, taking capital with them. There is also no guarantee that Singapore's "foreign talent" will stay in the country for the long term.
- **Inflation**  
If the Singapore economy is already operating at or near full employment, a rise in AD due to increased exports could possibly lead to demand-pull inflation. Singapore's persistently low unemployment rate suggests that her economy is operating at close to full employment already. Thus, inflation could be a potential problem.
- **Vulnerable to Supply Shocks**  
Importing raw materials from abroad also leaves Singapore vulnerable to cost-push inflation, more specially imported inflation. For example, Singapore was affected by the rise in oil prices due to political uprisings in the Middle East. Hence, Singapore is vulnerable to supply shocks.
- **Secondary Effects**  
A depreciation of the Singapore dollar is likely to be inflationary given Singapore's dependence on imported raw materials, and because it becomes more expensive to buy imported inputs which Singapore needs to produce goods. A deficit in the BOP (Balance of Payment) also means a decline in the country's foreign reserves which means that if Singapore has few foreign reserves, her currency will be vulnerable to speculative attacks.
- **Employment Woes**  
Globalisation could also potentially be harmful for employment. Singapore's heavy reliance on exports means that she will experience high cyclical unemployment should her major trading partners enter recessions. Perhaps, even more worrying is the increase in structural unemployment because lower-skilled workers could find their jobs being outsourced. Even if their work cannot be easily shifted abroad, they face competition from foreign workers willing to work longer hours and at lower wages. Concomitantly, there is a shortage of workers able to take on high-skilled jobs created by the global economy. As such, Singapore has had to import "foreign talent" to fill this gap. Therefore there are many negative implications for the labour market.