

CV0002 Engineers and Society Sem 1 16/17

Section A:

1. a. iv, b. i, c. iii, d. iii, e. iv

Section B:

2. a. David Marshall
b. Straits Settlement
c. Ong Teng Cheong
d. 1959
e. The Factory Act

Section C: (Answer Any Two Questions)

3. a. “The Industrial Revolution” is commonly referred as “The Machine Age” because of the profusion of machines (spinning, sewing, iron smelting) led by the mechanization of tasks. By early 18th century, urban merchants with banking and exchange practices gained control of commodity production. Capitalists formed new social class and challenged religious authority and hereditary privileges by emphasizing individual freedom to invest and trade as he saw fit. They emphasized individual freedom to invest & trade as he saw fit. Plunder from the colonies helped to finance the European industrial take-off. Continuous exploitation of colonial resources sustained European industrial growth & left a legacy of under-developed colonies. In England, the guilds were weakened by anti-monopoly legislation. In 1709, Abraham Darby discovered how to use coal to smelt iron – important raw materials to make machines & structures. In 1776, Adam Smith described the division of labor in pin making that greatly increased workers’ productivity. Once production processes were standardized, each process could then be replaced by a machine. Development of these machines completed the transformation to modern industrial production. Mechanization of tasks led to profusion of machines – for spinning, sewing, iron smelting, etc. Journeymen reduced to machines minders – people sold their raw labor power to owners of factories & mills. The industrial revolution provided employment for those displaced from the land. Social & economic impact of the industrial revolution –population growth. Population growth was both an underlying cause & a fuel for the industrial revolution – provided labor for new industries & markets for their products.

b. Personal Opinion

c. Solutions to Manpower Needs

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 of Foreign Talents
3. Internationalization

The Grooming of Local R&D Manpower

Measures to boost the local pool of researches 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.

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 student

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

d. Hock Lee Bus Riots – On 23 April 1955, workers from the Hock Lee Amalgamated Bus Company and some Chinese students began to go on strike. They were members of the Singapore Bus Workers' Union (SBWU) and were protesting against poor working conditions, long work hours and low pay. They also felt threatened by a rival union which was supported by the bus company to counter any labour action by SBWU. The strike was likely to be instigated by pro-communists as well as fanned by anti-colonial sentiments. Singapore had just held a Legislative Assembly Election on April and the Labour Front led by David Marshall formed a minority government after winning a narrow victory. The strikers stopped the buses from leaving the depots and crippled the city's entire transport system. In a show of support, students from the Chinese Middle schools came in busloads to join the strikers. The police attempted to disperse the picketers many times. On April 27 1955, police tried to break up the strikers and injured 15 people. This gained more public sympathy and support for the strikers, which was aptly encouraged and supported by the communists.

The Chinese middle school riots were a series of riots that broke out in the Singaporean Chinese community in Singapore in 1956. Resulting in 13 people killed and more than 100 injured. In 1956, after Lim Yew Hock replaced David Marshall as Chief Minister of Singapore, he began to take tough measures to suppress communist activities with the

support of the British Governor and Commissioner to Police. In September, Lim Yew Hock deregistered and banned two pro-communist organizations: the Singapore Women's Association and the Chinese Musical Gong Society. The Singapore Chinese Middle School Students Union was also dissolved. In protest, students gathered and camped at Chung Cheng High School and The Chinese High School. They sat in-over the next two weeks, organizing meetings and holding demonstration. On October 24, the government issued an ultimatum that the schools be vacated. As the deadline approached, riots started at the Chinese High School and spread to other parts of the island. Some nine hundred people were arrested, including Lim Chin Siong, Fong Swee Suan and Devan Nair. They were released in 1959 when the People's Action Party, led by Lee Kuan Yew, won the 1959 general election to form the government as Singapore gained self-rule.

4. a.

- 1945 return of British to Singapore after Japan's withdrawal
 - Shortage of food, water and electricity, shortage of houses, education problem and communist
- 1945-1948 Malayan Communist Party was formed and stir up people's feelings against the British
- 1948 – 1960 The Emergency period
- 1954 British has announced its willingness to leave Singapore while communists continue to create disorder
- 1955 – 1956 Hock Lee Bus Riots and Chinese Middle School Riots
- 1955 : Limited Self-government (Legislative Council became Legislative Assembly :25 seats were elected and 7 were appointed) : Chief Ministers David Marshall, Lim Yew Hock
- 1959 : Full Self-government : Prime Minister Lee Kuan Yew
- 1963 : Singapore as part of independent Malaysia
- 1965 : Independent Singapore

5. b. 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.

An action is considered to be practicable when it is capable of being done. Whether it is also reasonable usually takes into account:

- the severity of any injury or harm to health that may occur;
- the degree of risk (or likelihood) of that injury or harm occurring;
- how much is known about the hazard and the ways of eliminating, reducing or controlling it (what others practising, standards.); and

–the availability, suitability and cost of the safeguard

c. Strategy adopted by Singapore in response to counter terrorism:

I. Higher Vigilance

- Beefing up CCTV coverage over four years: additional cameras to cover common heartland areas with high human traffic; the Home Team to improve analysis and monitoring of CCTV footage; Police to access CCTV footage including those monitoring public transport and government buildings

- New laws for tighter security at buildings, major events: security screening at major events; MHA to engage developers of large-scale building projects on security measures; getting owners of premises to install CCTV systems

II. Stronger Response

- Dedicated Police Emergency Response Teams across Island: specially trained with counter-assault skills; equipped with more potent weapons; build familiarity with areas they look after

- Special forces to be enhanced: teams and Special Operations Command and Gurkha contingent to arrive on scene faster

III. Community Effort

- New national programme to prepare the community and develop resilience; The SGSecure programme will revamp and scale up the existing Community Engagement programme; programmes to raise awareness and train Singaporeans to respond to an attack.

d. Positive Impacts of Globalization (Choose Any 3)

- It creates greater opportunities for firms in less industrialized countries to tap into more and larger markets around the world.
- This can lead to more access to capital flows, technology, human capital, cheaper imports and larger export markets
- It allows businesses in less industrialized countries to become part of international production networks and supply chains that are the main conduits of trade.
- It contributes to develop health and education systems in developing countries as globalization is a catalyst to jobs that require higher skills set and economic growth helps to raise health standard
- It helps to raise business productivity as firms compete to increase their market shares, both locally and internationally.

Negative Impacts of Globalization (Choose Any 3)

- The growth of international trade is exacerbating income inequalities, both between and within industrialized and less industrialized nations

- Global commerce is increasingly dominated by transnational corporations which seek to maximize profits without regard for the development needs of individual countries
- Protectionist policies in industrialized countries prevent many producers in the less developed countries from accessing export markets
- The volume and volatility of capital flows increase the risks of banking and currency crises, especially in countries with weak financial institutions
- Competition among developing countries to attract foreign investment leads to a race to the bottom in which environmental standards are being compromised
- Cultural uniqueness is lost in favour of homogenization and a universal culture that draws heavily from American culture.

6. a. Importance of AEC

- ASEAN is the largest market after USA and China.
- Open the boundary for movements of investments, resource, talent, service within ASEAN
- Cash flow and capital can be flowing more easily amongst the countries therefore boost the economy
- Competitive economic prospects may foster a culture of fair competition which includes protection of consumers and guarantees for intellectual property rights.

b. Five Future Challenges

I. Jobs

- The nature of jobs will change over the medium to long term. For example, 3D-printing and additive manufacturing are changing the ways factories are configured and organized; new skills are needed as jobs have to be redesigned and talents groomed to man such new manufacturing jobs. Workers need to be retrained and students must acquire such knowledge before entering the workforce.

II. Companies

- Future companies will be marked by the rise of disruptive business models and competition from abroad. So staying competitive means exploring cooperative platforms for different business clusters to cooperate with one another and maximize capabilities.

III. Technology

- Technology undeniably presents a challenge, and while Singapore has invested heavily in education, research and development, the future of technology hinges on how this can be translated into innovative processes.

IV. Resources

- Not all innovations are technology-related; the future of resources will look at how to organize one's resources like land or human resources in creative and competitive ways.

V. Markets

- The future of markets is important because if firms expand overseas, we will transcend the Singapore market and achieve scale economy.

c. Singapore is a republic with a parliamentary system of Government based on the Westminster Model. The Constitution of the Republic of Singapore provides for a President who is the Head of State. Prior to 1991, the President was appointed by Parliament and had a largely ceremonial role. In January 1991, the Constitution was amended to allow for the election of a President by the citizens of Singapore. The elected President will hold office for a fixed term of six years. There are no term limits to the presidency. The creation of the elected presidency is a major constitutional and political change in Singapore's history. The elected President has the responsibility under the Constitution to safeguard the national reserves (US\$248b today) and the integrity of the public service in Singapore.

Under the revision, the President is empowered to veto government budgets and key appointments to public office. The President must, however, consult the Council of Presidential Advisers before he takes a decision on some of these matters.

d. Engineering is a profession serving society. As such, society imposes special obligations on engineers as they are so called code of ethics which all engineers are expected to follow. Ethical responsibilities are placed on engineers because they provide services or make judgements that are not easily understood by the general public. Furthermore, the results of their work impact society as a whole. The fundamental principles of engineering ethics are as follows:

1. Hold paramount the safety, health and welfare of public
2. Perform services in area of competency
3. Issue public statement in an objective and truthful manner.
4. Act for employer or client as a faithful agent and trustee
5. Avoid deceptive acts.
6. Conduct themselves honorably, responsibly, ethically and lawfully so as to enhance the honor, reputation and usefulness of the profession

Example:

The disaster at Bhopal due to the leakage of MIC took away 10,000 lives and caused 20,000 injuries is a result of compromising the safety measures for profits. Several safety

precaution was not activated accordingly at the time of emergence, and therefore caused the disaster to happen. It also displays engineering ethics disregard.

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