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## 2017 Preliminary Examination 2 Pre-University 3

**ECONOMICS**

**9732/01**

Paper 1: Case Study

**12 September 2017**

**2 hours 15 minutes**

Additional Materials: Answer Paper

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### **READ THESE INSTRUCTIONS FIRST**

Write your name and class on all the work you hand in.  
Write in dark blue or black pen on both sides of the paper.  
You may use a soft pencil for any diagrams or graphs.  
Do not use staples, paper clips, highlighters, glue or correction fluid.

### **Answer all questions.**

Begin your answer to Question 2 on a fresh sheet of writing paper.

At the end of the examination, hand in your answers to the 2 questions **separately**.

The number of marks is given in brackets [ ] at the end of each question or part question.

Answer **all** questions.

### Question 1

#### Towards a Smart Nation

**Table 1: Volume of mobile data usage (% change across each year)**

Year	2011	2012	2013	2014	2015	2016
%	17.64	26.14	31.97	20.66	10.21	17.29

Source: *IMDA's Annual Surveys on Infocomm Usage in Households and by Individuals*

#### **Extract 1: Enabling digital inclusion as Singapore moves towards a Smart Nation vision**

Singapore wants to be a “Smart Nation” where people live meaningful and fulfilled lives, enabled seamlessly by technology.

Singapore has a mobile penetration rate of about 155 percent. Averaged out, that is more than one mobile phone per citizen. Residential wired broadband subscriptions have also been increasing over the years, peaking at over 1.3 million subscriptions in the first quarter of this year. However, 13 percent of households are without internet access. Nine percent indicate affordability issues. The Infocomm Media Development Authority of Singapore (IMDA) has in place a slew of measures to mitigate the potential fallout of a digital divide.

For the elderly, there is the Silver Infocomm initiative. It bridges the digital divide among seniors aged 50 and above, by addressing differences in educational background, language and infocomm competencies. Since its inception in 2007, it has offered more than 95,000 training places. For needy households with school-going children, there is the Enhanced NEU PC Plus. Households are equipped with new computers or laptops with up to 75 percent subsidy, and three-year free broadband access. More than 20,000 low-income households have benefitted, since its launch in November 2006. Most recently, there was the launch of a S\$10-million Digital Inclusion Fund. Part of the money will go into a Home Access programme rolled out in April this year to provide low-income households with Internet access. The bundle includes a basic computing device, for example a tablet and four years of fibre broadband connectivity, for as low as S\$6 a month. Expected to benefit 8,000 households, so far only close to 300 households have tapped on the scheme. IMDA also funds programmes by organisations like the Society for the Physically Disabled (SPD).

Source: Channel NewsAsia, July 2015

#### **Extract 2: Unlimited data means network congestion**

With smartphones becoming increasingly ubiquitous, there has been a steep increase in mobile data traffic, in turn putting “a strain on the limited radio spectrum”. In 2011, following M1’s phasing out of its unlimited data plans, StarHub’s Vice-President of Personal Solutions Joanna Chan commented: “Globally, mobile operators expect the usage of data to grow with the rising popularity of smartphones. In view of this trend, Singapore operators may have to review current pricing plans and consider introducing usage-based data pricing, to ensure that network quality for customers remains optimal.”

The rest, as they say, is history. In 2012, StarHub discontinued their unlimited and 12GB data bundles. In a move which analysts labelled inevitable, the three telcos began to phase out not only unlimited data, but 12GB plans. And this certainly wasn't unique to Singapore; globally, telcos like AT&T and Verizon Wireless began to stop offering unlimited data bundles, citing network congestion as the main reason for the switch.

So in a toss-up between faster network connection and smaller data bundles, or unlimited data and a clogged network, it looks like SingTel, StarHub and M1 decided to go with the former.

Source: *Various*

### **Extract 3: Digital telco expands to new countries, expects to hit 4-6% of Singapore's mobile market**

Mobile telco upstart Circles.Life burst into the Singapore market last May with an all-digital post-paid offering. Circles.Life claims that it is all about choice and the goal of returning power to consumers. Subscribers could sign up through the company's website, monitor their usage, and switch between different plans through the Circles.Care mobile app without having to set foot in a physical store. Most importantly, they could have an abundance of data without being tied to a two-year contract. They have the freedom to 'boost' their data cap with bite-sized data chunks (100MB, 250 MB, or 500MB) for just a few dollars. The specific segment Circles.Life is targeting is the big data-savvy segment in Singapore –made up of people ages between 20 – 45 who like to buy things online. Circles.Life's interaction with all its subscribers are all through email, social media, and live chat.

Almost a year later, the company feels good about its place in the market, having hit "100 percent of its target market." This means that Circles.Life has achieved the traction it wanted among younger, tech-savvy audiences for whom mobile data is more important than talk time and text message quotas.

CEO Rameez Ansar says the company was the first to combine all-digital services with big mobile data offerings, so the response from a data-starved market is not surprising. One of its major selling points is a system that rewards users with extra data for things like referring friends to the service, sticking with the service for enough time, and porting their number from previous carriers. There's even a gamification element, with the most active referrers grabbing the top spots in an online leaderboard. The telco also offers perks like free caller ID and WhatsApp usage.

For now, Circles.Life is on track to capture 4 to 6 percent of Singapore's mobile market in the next few years. In contrast, as of May 2016 when Circles.Life launched, Singtel had a market share of 48.1 percent, StarHub 26.7 percent, and M1 25.2 percent, according to Singapore daily *The Straits Times*. Circles.Life's smaller percentage reflects the niche audience it is targeting. Circles.Life is a virtual network that uses M1's infrastructure to offer its services, so M1 counts its subscribers as its own.

Co-founder Abhishek Gupta believes it can stand out by being asset-light. "The big challenge is we don't own the network so we can't upgrade it. So if we wanted to build a tower to get better quality WiFi, we can't do that," says Gupta. "But we have a lot of faith in the regulator and the

kind of guidelines they set to ensure good quality of service. IDA (now IMDA) regulations require telcos to meet a certain standard of quality, so that gives us a lot of comfort,” he adds.

The young telco is also looking to export its model beyond Singapore. It wants to be in three to five new countries in the next three years. At the moment, it has crystallized plans to land in Indonesia and Hong Kong by end-2017.

Rameez says the company will follow the same model of partnering with a local telco to reach subscribers through its infrastructure, which helps Circles.Life keep its spending in check and be more flexible in rolling out new products.

Sources: <https://e27.co>, October 2016 and <https://www.techinasia.com>, March 2017

### Questions

- (a) (i) Describe the trend in the volume of mobile data usage in Table 1. [1]
- (ii) Suggest a possible reason for the trend. [2]
- (b) Explain why the government is intervening in the market to bridge the digital divide to achieve the Smart Nation vision. [4]
- (c) (i) Define a private good. [1]
- (ii) With reference to Extract 2, explain why mobile data is a private good. [2]
- (d) State and justify the type of market structure that firms in the telecommunication industry in Singapore operate in. [2]
- (e) Assess Circles.Life’s business strategy for its long run survival. [8]
- (f) Using the case material and/or your own knowledge, discuss the impact of the entry of Circles.Life on the society. [10]

**[Total: 30]**

**Question 2****Technology and the Economy****Extract 4: What is the Fourth Industrial Revolution?**

The First Industrial Revolution used water and steam power to mechanise production. The Second used electric power to create mass production. The Third used electronics and information technology to automate production. Now a Fourth Industrial Revolution is building on the Third. The Fourth Industrial Revolution includes development of digital services and robotics technology such as artificial intelligence and machine learning.

Our lives are being shaken to their very core by technological change, with the Fourth Industrial Revolution transforming economies as never before. To appreciate the changes at hand, two interrelated aspects of the economy are particularly illustrative: growth and productivity on one hand, and employment on the other.

Source: World Economic Forum, 2016

**Extract 5: Is technological change creating a new global economy?**

Productivity is the most important determinant of long-term growth. Yet productivity growth has stagnated around the world, particularly since the great recession. An important question is how the Fourth Industrial Revolution will drive productivity in the years to come.

In theory, the application of new technologies to existing problems should improve efficiency and thus productivity. Technological innovations tend to raise labour productivity by allowing the existing workforce to do more with less, and by replacing existing workers with technology. They also usher in new products and processes that open up new sources of growth.

However, there is much debate on the likely size of the impact of the Fourth Industrial Revolution. On one hand, some experts believe that the productivity impact of the current technological revolution is almost over. On the other hand, other experts believe that the world will soon be experiencing faster growth due to a major surge in productivity.

Perhaps there are such divergent views because the impact of technology is so difficult to measure. The Ubers and Airbnbs of the world are clearly providing efficiency and productivity gains. Yet many of the benefits of these new activities are not accounted for in the calculation of GDP in the same way that private housework and childcare are neglected.

Source: World Economic Forum, 2016

**Extract 6: What happens when robots turn white-collar?**

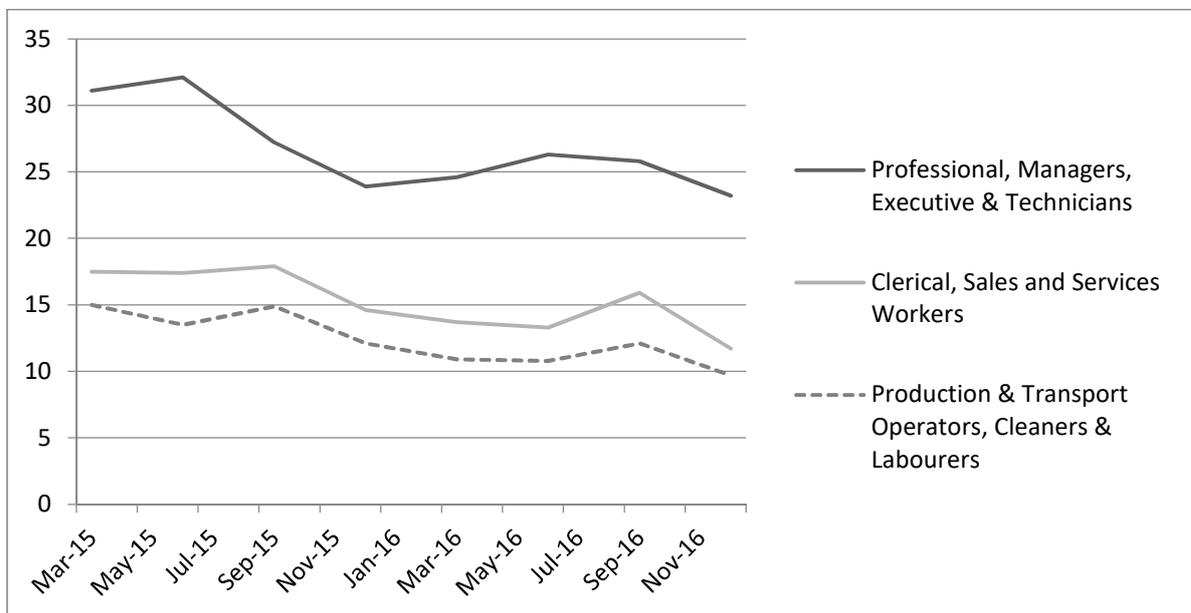
Throughout the ages, technology has replaced human effort, which while good for productivity growth and growth overall, is disruptive for those workers who lose their jobs.

And with the Fourth Industrial Revolution, this is no longer just about repetitive factory jobs: new computing and robotics technologies now threaten many “mid-skill” professions that had seemed “safe territory”, such as accountants, taxi drivers and paralegals.

It has always been the case that technological innovation destroys some jobs and replaces them in turn with new ones, in a different activity and possibly in a different place. As technological innovation forges ahead, one can expect that low-skill activities will be progressively replaced by tasks that require creativity and social intelligence. The Fourth Industrial Revolution is different in that it is primarily middle-skilled labour that has been affected. And as the disappearance of “mid-skilled” causes the job market to become increasingly segregated into a “low-skill/pay” segment with increasing numbers of people competing for ever fewer jobs and a “high-skill/pay” segment with few highly-demanded workers, social tensions will inevitably rise.

Sources: World Economic Forum, 2016 and International Monetary Fund, 2017

**Table 2: Job vacancies in Singapore by occupational group (in thousands)**



Source: Ministry of Manpower, 2017

### **Extract 7: Technological disruption may push up unemployment rate**

Singapore’s labour market faces challenging times ahead, and not just because of the slowing global economy.

The lacklustre sentiment has stunted job creation and prompted a wave of layoffs in the hardest-hit sectors, but more worrying is the prospect that an unemployment rate higher than what Singaporeans are used to might become the new normal.

Singapore’s unemployment rate – which now stands at 2.1 percent – has for decades been low by international standards. But it might be on track to rise in the face of unrelenting technological change that leaves old skills outmoded. The ones relevant to new realities may take a while to acquire.

In the short run, the slowing global economy will remain a key contributor to downbeat labour market sentiment. Beyond the current downturn, however, some structural challenges will persist for a longer time – including the gulf between the skills workers have and the ones that employers want.

In its latest macroeconomic review, the Monetary Authority of Singapore said skills mismatches in the labour market are on the rise. These are leaving laid-off workers – especially professionals, managers, executives and technicians (PMET) – struggling to find new jobs, the central bank noted.

Disruptive change has hit almost every industry, and jobs are evolving faster than ever. In addition, the Singapore economy is increasingly moving towards higher value-added, niche sectors – such as medical technology and data analytics – in a bid to maintain its competitive edge. These provide good jobs, but require specialised skills that most retrenched PMETs do not have. They also offer fewer jobs, given their small, specialised nature.

This means Singapore might have to get used to a higher rate of structural unemployment – caused by a mismatch between workers’ skills and those demanded by employers.

Source: The Straits Times, 2016

### Questions

- (a) (i) Define labour productivity. [1]
- (ii) Using Extract 5, explain how technological development would affect the production possibility curve (PPC) of an economy. [2]
- (b) Explain the statement that “many of the benefits of these new activities (from technological development) are not accounted for in the calculation of GDP in the same way that private housework and childcare are neglected”. [3]
- (c) With reference to Extract 6, explain how the Gini coefficient is expected to change with technological advances. [4]
- (d) (i) Describe the trend in job vacancies in Singapore. [2]
- (ii) To what extent is the above trend a result of the Fourth Industrial Revolution? [8]
- (e) As an economic advisor to the Singapore government, evaluate the possible options to reduce unemployment in Singapore. [10]

**[Total: 30]**

**End of paper**

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