"As Singapore shifts its economic focus from industralization to a knowledge based economy, attaining academic qualifications is becoming increasingly important. Knowledge is now recognised as a main driver for economic productivity and growth"

a. Explain the terms 'public good' and 'positive externality', making clear in each case how they cause markets to fail.   [10]

Suggested Answer

Synopsis: Public good and positive externality should be explained via examples. Question should also requires students to demonstrate how public good and positive externality are sources of market failure.

1. Explain public goods
    a. **Definition**
    b. **Explain non-rivalry in consumption using example**
    -   It means that consumption of the good does not reduce the total supply to available to others.
    -   Use of street lighting, upon consumption by one person does not leave less available for others. (Other examples are traffic lights, light house)
    c. **Explain non-excludability in consumption using example**
    -   It means that once the good is provided, it is impossible to exclude any consumers from using it.
    -   Once produced, the good is available to all members of the community irrespective of whether the individual pays for it or not.
    -   National defence is one good example, once produced, it provide protection for all in the country and even for those who did not pay taxes. E.g. students. (other example includes free to air television channels and radio broadcasting)
2. How public goods cause market to fail
    a. **Explain how non-excludability gives rise to free rider problem**
    -   Due to non-excludability nature of the good, we cannot exclude non payers from enjoying the good. They would then consume without paying for it and thus they free ride on the production made.
    b. **Explain the output in the market**
    -   Private sector will not be willing to produce such goods due to non-excludability characteristics and it makes charging a price impossible for firms.
    -   Thus, in the free market which is profit-driven, no resources will be allocated to the production of public goods. Hence, no provision of public goods.
    -   This causes market to fail.

3. Explain positive externality
    a. **Definition**
    b. **Explanation using example (e.g. Vaccination)**
    -   Activity taken is vaccination against H1N1.

- 1st parties are the ones undertaking the vaccination and incur private costs and private benefits. (Private cost here to refers to the cost of the vaccination and private benefits refer to the protection from H1N1 virus.)
- Their actions to take the vaccine has a positive external benefits on the society.
- 3rd parties are the people around those who are immunised or come in close contact with them.
- Helps to reduce the chances of 3rd parties to get H1N1. (External Benefits)
- The positive externality gives rise to external benefits to 3rd parties who are not directly involved in the consumption of the vaccination.
- External Benefits comes in terms of lower medical bills and more pleasant living condition for people.

4. How positive externality can cause market to fail
   a. **Objective of the 1st party**
   - Maximise net private benefits, choosing output where MPB=MPC.
   - When the 1st party consumes, they generate positive externality for the society, meaning generate external benefits for the society.
   - It will cause a divergence between private benefits and social benefits.
   - (MSB>MPB)
   b. **Objective of the society**
   - Maximise societal welfare.
   - Net social benefit, preferred output where MSB=MSC.

[Figure 1]
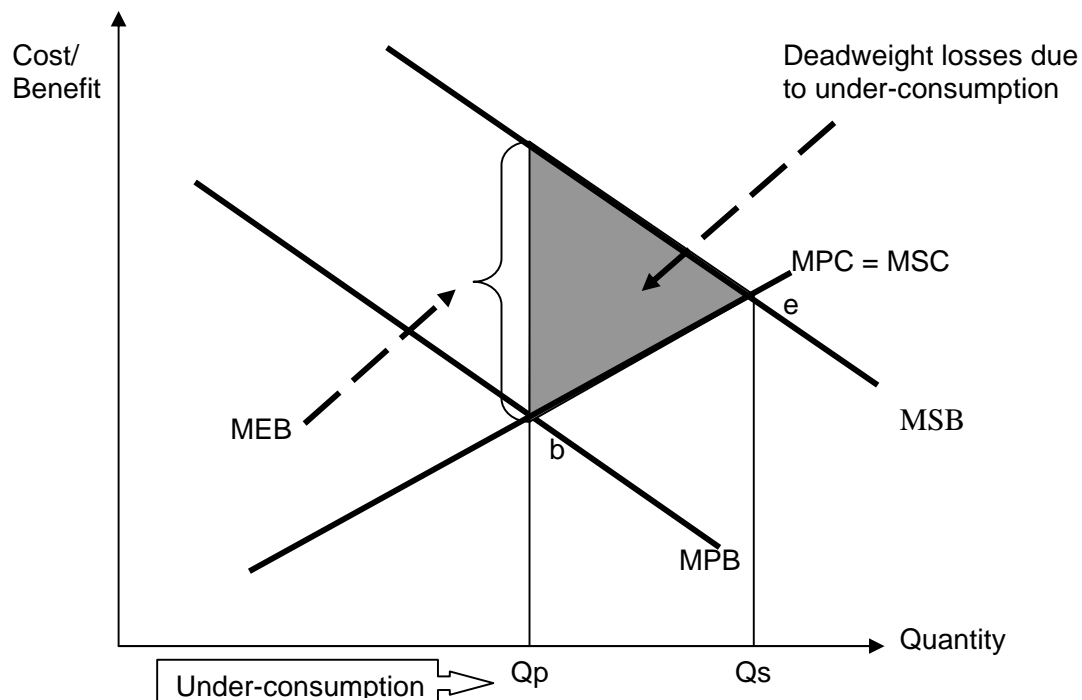
- Refering to figure 1, 1st party would maximise own net benefits at Qp where MPB=MPC and the optimum output for the society is larger at Qs where MSB=MSC.
- With the individual seeking to sastify their self interest, the quantity consumed is less than the socially optimum level. Society will be better off if consumption is at Qs.
- With MSB>MSC, any consumption less than Qs addes more benefits than cost for the society. Hence, there is an under-allocation of resources and under-consumption of the good.
- The shaded region represents the monetary measure of welfare loss to society when 1st parties are maximising their net private benefits at Qp. This deadweight loss to society is due to under-consumption of goods.
- Thus, market failure results from under-consumption of the goods that exhibits positive externality.

5. Conclude that there are many sources of market failures and it is important to solve it with relevant policies.

L 1	Mere listing of the characteristics of public goods and positive externality or very brief explanation of how they cause markets to fail	1 - 4
L 2	Able to explain in detail the main characteristics of public goods and positive externality using examples, with some valid reasons on how they cause markets to fail	5 - 6
L 3	Able to explain in detail the main characteristics of public and positive externality using examples, with excellent explanation of the reasons on how they cause markets to fail	7 - 10

b.   Assess the extent to which a subsidy is the best policy to tackle the market failure arising from education in Singapore.   [15]

Synopsis: Question need to elaborate on how subsidy can tackle market failure coming from education in Singapore. To assess the extent to which subsidy is the best policy, we need to explore alternative policies and compare them. There is a need to explore the limitations of any policy that is brought up.

1. Education -   Merit good that exhibits positive externality.
                -   Education provides external benefits for the society in terms of increased educated and productive workforce as a whole.
2. Explain the use of subsidy to tackle the market failure
                -   Education creates positive external benefits on the society
                -   In the education market, production or consumption level is below socially optimum level. (MSB>MPB)
                -   Market failure results from the under production or the under consumption.
    a. How subsidy address market failure
    -   Having subsidy in Singapore, it wil lowered the price of education and thus attracting more students.
    -   Subsidies should be equal to MEB.
    -   The MPB curve will shift up by the extent of the MEB and thus coincide with the MSB. The 1st party would now choose output where MPB'=MPC.
    -   Thus, the new quantity of education will be at the socially optimum level at Qs.
    -   Refer to diagram 2

Diagram 2
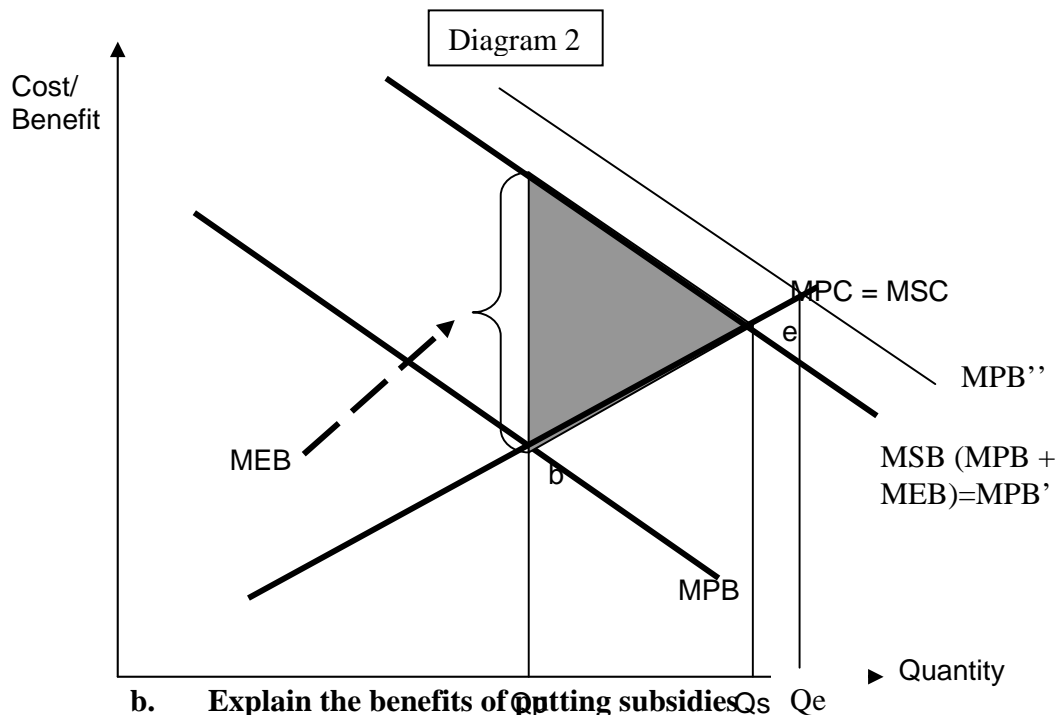
    b.   Explain the benefits of putting subsidies
    -       Internalise the external benefits
    -       Achieve socially optimum level of education

- Education is more affordable to the masses

c.   Limitations of using subsidy
- Difficult to measure external benefit. Hence possible that subsidy may be inadequate or excess
- Excess subsidy can lead to market failure. (Overconsumption at MPB'' using diagram 2.
- Away from the socially optimum at Qe.

(Explain that there are alternative policies that can be used to address the market failure from education.)
3. Legistration-compulsory education
- Use of compulsory education of students up to primary six by The Complusory Education Act (cap 51)
- Shows how it address market failure (Diagram)
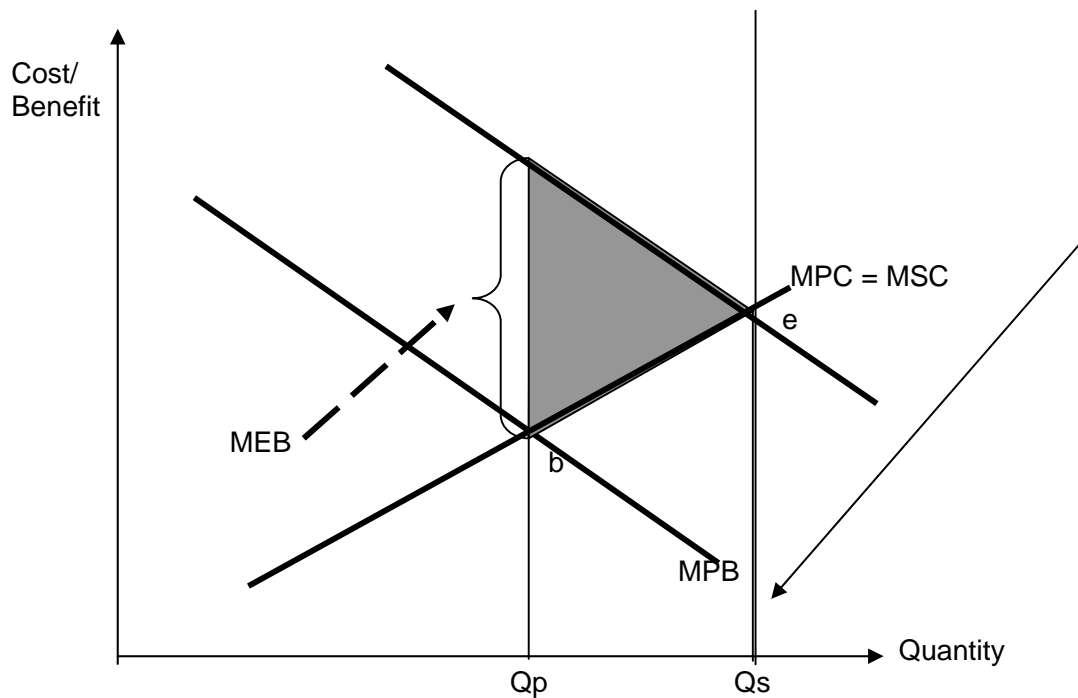
[Diagram 3]
From diagram 3, we are able to achieve Qs by enforcing compulsory education.

- **Explain the benefits of having compulsory education**
- Thus, quantity of education will edge towards the socially desire level, Qs.

- **Limitations of having compulsory education**

- Problem with enforcement of this policy.
- Incur monitoring cost for the running of this policy.
- Compulsory education is up to primary six only and thus limited in scope to create an educated workforce.

4. State sponsorship of tertiary education
   - Full payment of school fees and school expenses totally by government.
   - Zero payment for education will entice more students to work harder to enter university.

a. Explain benefits of free education
   - More incentive to work harder since no loan taken for school, no debts after graduation.
   - More needy but brighter students can enter the university and could contribute higher productivity growth in the near future.
   - Aid education to achieve its socially desire level.

b. Limitations of having free education
   - Precious resources could be used to fund other infrastructure or investment, but forgo for the sake of free education.
   - May end up paying for student who can afford instead of those who cannot afford to attend school.

     [Alternative policies also include education service provided by voluntary organization, increasing supply of education centres by government , bursaries and scholarships]

5. Compare compulsory education with subsidy.
   - Is subsidy really the best policy when compared to compulsory education? (Assess the extent)
   - Yes due to scope of coverage. Subsidy covers all the way till university education while compulsory education covers till primary school level only.
   - The 3rd party benefits would be greater for subsidy as students from tertiary education can join in the workforce soon and raise productivity for the society as a whole.

6. Compare subsidy with state sponsorship.
   - Is subsidy really the best policy as compared to state sponsorship?
   - No. subsidy only provides less than 100% of school fees to be paid.
   - State sponsor will really create a bigger market as compared thus it its able to target poorer audience that has high ability to try tertiary education.

7. Conclusion
   - The extent to which subsidy is really the best option, we got to see the root of the market failure in education for Singapore.

- In Singapore, education can be better seen as under-production rather than under-consume.
- So comparing all the viable policies at hand, subsidy can be the best policy if we use it to target production.
- Subsidising the building of more universities and more specialised polytechnics would help expand supply of educated workforce in the near future.
- Subsidy as a policy can only do so much, thus extent of the best policy becomes little as other policies might be able to do much better job.
- A complementary mix of policies can resolve the market failure resulting for education.

L3	For an excellent answer that is able to explain subsidy with its limitations and offering other relevant policies that is able to target the root of the issue. Detail analysis is given.	9-11
L2	For an answer that is able to explain subsidy, its limitations and offering other alternative policies as viable options but lack detailed analysis	6-8
L1	For an answer that attempt to explain subsidy as a best policy but lacking in depth and mere listing of policies without much elaboration	1-5

E2	For an evaluative judgment based on analysis and supported with a strong conclusion.	3-4
E1	For an unexplained judgement, or one that is not supported by analysis	1-2