

Quality Aspects in Vocational Education towards Building up of Entrepreneurship Skills and mindsets – a need of the era

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Abstract— Peace, prosperity, and sustainability are considered as the ultimatum for the countries and economies, and the rejection of which will result in retaliation or a breakdown in relations. To peace and sustainability to become a relative reality, the ‘graduates of tertiary education should be entrepreneurs at last in its simplest sense. Furthermore, for the countries irrespective of developed or developing, to maintain the momentum of developments and to look for the gaps and new competencies, creativity and innovation based startups, entrepreneurial skills in their workforces are considered as essential (Global HR Forum, 2018). Hence is the strong requirement for the quality in education to be revisited. Though the above is the need, the responsible bodies are yet to fathom the right and appropriate strategies to face the future challenges and the competitions with this need of entrepreneurship centered education. The main objective of the study is to find out how far the assessments of study programmes gauge the students’ entrepreneurial mindset. The question papers of higher study programmes were studied comparing a question paper that could be considered as a bench mark which possesses the characteristics that would contribute in inculcating and gauging entrepreneurial skills in students. It could be concluded that while inclusion of entrepreneurship into curriculum as separate subjects or topics in some subjects is visible to some extent, the entrepreneurial discussions are not integrated in an effective manner especially in the assessment modes of written papers. The most question papers that were subject to this study show that they merely test the memory of the concepts of entrepreneurship. Further, it shows that there is little integration of “teaching” entrepreneurial skills across module wise. The study also creates a research territory as the study areas in his regard are numerous.

Keywords— Entrepreneurial Mindset, Quality Reflection Factors, Quality Assurance in Education

I. Entrepreneurship Mindset as a Key Facet in Quality in Education – An Introduction

Within the present context, even many of the study programmes leading to existing businesses and employments will be obsolete in the coming decade (Reinfeldt, 2018). This is more relevant to even for the countries in the developing stage, to develop further, by not falling into middle income trap. The suggested answer is to integrate entrepreneurial skills into education and startups based on creativity, and innovation. Also by considering the fourth industrial revolution (Artificial intelligence, big data, Nano-technology, etc), new breed of entrepreneurs are

considered mandatory for driving the economies (Reinfeldt, 2018). Since education is the most important changing force, the quality aspects and assurance with regards to this embodiment of entrepreneurship into the entirety of education is considered a timely and futuristic need. Hence is the strong requirement for the quality in education to be revisited. As identified in modern developed nations such as Korea, Japan, Taiwan, US, it is Technical and Vocational Education and Training that is recognized as the key sector to be effectively driven for the above cause (Meyer, 2018)..

II. Current scenario – arguably an obsolete, and need for an interventions

The outcomes of education, in the current context and phase, can be considered as below the acceptability level. University graduates face unemployment. The same would be the destiny of the students passing out from the TVET sector institutions (TVET Country profile, 2018)). If not unemployed, many would be under employed. Some are waiting for the government to provide employments. Job satisfactions can be considered at very low levels, among the majority of employees. Creativity and innovations, and startups are less and below the standard. Even there are attitude issues. These reflect the lower level outcomes in education, and hence the current system of education can be seen as obsolete, and therefore need remedial interventions.

III. Providing Entrepreneurial Skills and Mindset through Teaching and Learning – The Interventions

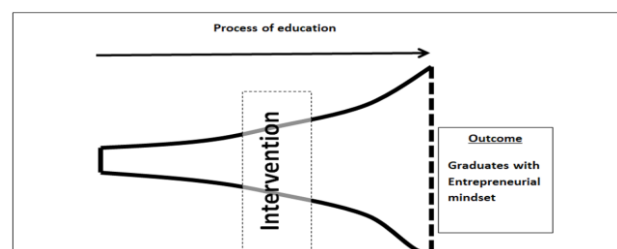


Figure 01: Intervention as the necessary change of creating entrepreneurial skills and mindset with relevant Quality Reflection Factors (QRF) (Liyana & Warahena, 2018).

Referring the sections 1 and 2 above, the intervention necessary for the education to create entrepreneurial skill with necessary Quality Reflection Factors (QRF) can be schematically shown in the above Figure 01. In this experience based conceptual schematic, the recognizing the nature of intervention is very important. Also the assuring of the quality of the intervention can be reflected through the Quality Reflection Factors (QRF)

Quality in essence is an intangibility, despite the fact that almost entirety of current quality assurance processes focus on tangible outcomes, especially in their measurements. The processes that come to mind in a discussion of quality assurance in global context are ISO series for diverse fields. It could be argued that their main emphasis is to ensure efficiency and effectiveness by systems, and supervisory procedures which compel the relevant ‘community’ to respond willingly or otherwise. Therefore in the recognition of multifaceted nature of quality with special reference to TVET, QRF needs additions to what Liyanage and Warahena suggested (2018) for education related to entrepreneurship skills. Prior to this, it will be appropriate here to be familiar with the the concept of Quality Reflection Factors.

IV. The concept of QRFs explained step by step

Quality Assurance processes generally manage three main areas viz. input, process and output.

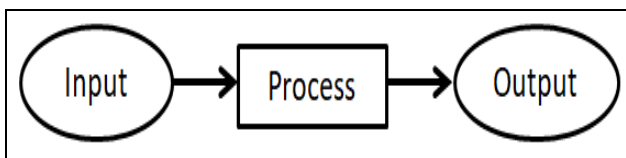
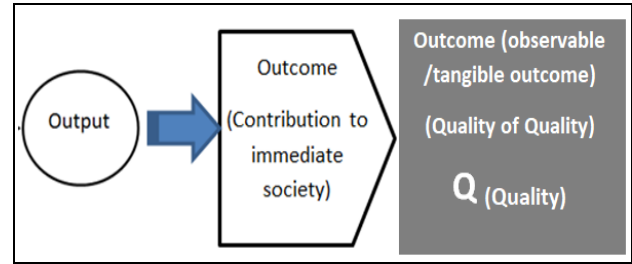


Figure 04: Schematic of the input, Process, and output in Quality Assurance Process

When the above Figure (04) is related to an educational context the output is the number of passed out students. The number is tangible but the total contribution to the immediate society the passed out students make through their total behaviour could be understood as the outcome, which should only be observed beyond tangible measurements.

There have been discussions lately about further extended area of output called outcomes. The figure 05 (a) and (b) below are the schematics of the outcome as an extension of output. Quality assurance is therefore to create a consistent

cause to make this (intangible positive values) in the



outputs, with which one might identify it as outcome, in this discussion, inclusion of entrepreneurial mindset.

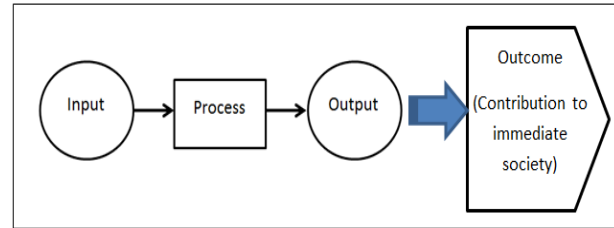


Figure 05 (a): Schematic of the output extended to the Qualitative outcome

Figure 05 (b): Schematic of the output extended to the Qualitative outcomes

The outcome is ‘judged’ by the ‘value’ of the total contribution to the society; this means the numerical value of mere output may have no meaning whatsoever in instances where the contribution to society becomes low or no value. As Sahney, Banwet and Karunes (2004) observes “in keeping with the socio-economic and cultural transformation that has placed newer demands on the educational system, in terms of greater responsibility and accountability and increased expectations by stakeholders, the system has been pressurized to shift its focus from one in quantitative expansion to one with emphasis on quality”.

What is implied here is that there should be some ‘in-built characteristics’ in the outputs, for instance, in passed-out students, that make them automatically contribute to immediate society positively. If the focus in this discussion is to narrow down to higher education it can be observed ‘under-theorised and under-researched’ Quality Assurance effects in Higher education(Newton, 2013, p. 8), the available methodological options for impact analysis in HE have not been exploited (see, e.g., Stensaker et al., 2011; Suchanek et al., 2012), and important stakeholders, such as students and teachers, have not been adequately involved in impact studies (cf. Volkwein et al., 2007, p. 253; Westerheijden et al., 2007, pp. 305, 309). Therefore there is a need for different approach. The idea could be illustrated as follows, with the figures 03 and 04 below, together with the recognition of innovative and holistic Quality process for the Quality of Quality.

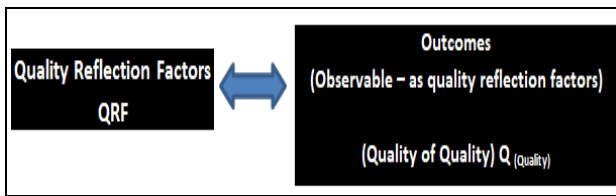


Figure 06: QRFs for judging the outcome of entrepreneurial mindset

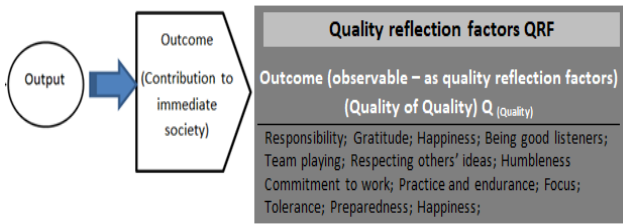


Figure 07: QRFs – an extension of the Quality outcomes

It could be argued that main emphasis to ensure efficiency and effectiveness by systems, and supervisory procedures which compel the relevant ‘community’ to respond willingly or otherwise as stated above is the main focus in quality assurance processes right now. It is because of this reason the paper opens up the discussion on how far and how much mind factors which could revolutionize the perspectives of sphere of quality assurance could be relevant in realizing the whole concept of including assuring the quality of the delivery of entrepreneurship skills in education. The suggested QRFs in this regard are ideas, imaginations, initiatives, creativities and innovations, knowledge and understanding (reasoning), attitudes and interests, thinking, and exposures

v. The Focus of the Study

The interventions discussed in section 2 above have many facets: curricula, modes of delivery, pedagogy or andragogy, to name a few. The focus of the ongoing research is to commence with the assessments of different components of study programmes; to be precise, how they reflect the inclusion of gauging the entrepreneurial mindset of students. The study has been narrowed down to ‘assessing’ the contents of question papers in general, and question papers related to entrepreneurship modules in particular against a question paper (which could be produced at request) that could be considered as a bench mark which possesses the characteristics that would contribute in inculcating entrepreneurial skills in students.

An ideal question paper should possess a potential to unleash the qualities and aspects of entrepreneurial mindsets within the students, once they respond to the questions. It is purposely set to bring the ideas, imaginations, initiatives, creativities and innovations, knowledge and understanding

(reasoning), attitudes and interests, thinking, and exposures out from the students mind and reflected through the answer scripts. This reflection can be illustrated with the figure below, and the English letter –I–s in the figure are the ideas, imaginations, Initiatives, and Innovations with creativity.

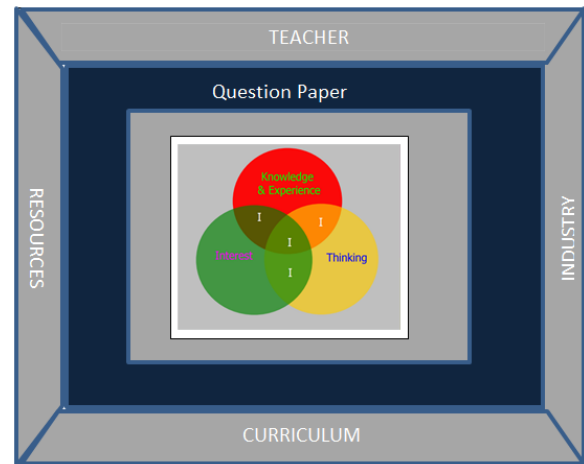


Figure 08: “Lin-War Window” for constituents of written question papers and expected responses of trainees.

The authors are of the view that the written question papers should reflect the Curriculum, Resources, Industry, and Teacher (pedagogy, training modes). That reflection should be able to extract the Knowledge and Experience, Thinking, and Interest, of the trainee, sharpened through the entire education process and the answers or the responses of the trainees should demonstrate their four Is -. ideas, imaginations, Initiatives, and Innovations.

vi. Analysis of question papers

Q Number	Q Part	QRF ideas, imaginations, initiatives, creativities and innovations, knowledge and understanding (reasoning), attitudes and interests, thinking, and exposures	Linguistic strategy / communication and written ability
1	1.1	Analytical skill	
	1.2	Analytical skill	
	1.3	Knowledge and understanding	Why is there...
	1.4	Thought provoking	Assuming that
	1.5	Thought provoking and analysis, foreseeing situations	If the country is importing...
	1.6	Idea generation	Suggest six ideas...
2	2.1	Thinking, Patriotism,	If you think of

		ideas, strategizing, imaginations,	adapting....., You may consider.....
	2.2	Information communication, Ideas, Creativity	As an attempt to...
	2.3	Synthesizing and evaluation (Ref. Blooms taxonomy)	justify the effectiveness
3		Expanding horizons	The knowledge of..., should not be limited to concepts and memories....., are blessings for countries and nations
	3.1 a and b	Idea generation within entrepreneurial context, Creativity	
	3.2 a, b, c, d	Contextualizing to global and national trends and interests	
4	4.1 to 4.4	Juxtaposing technology and art of living, sensitivity to the environment and resources, emphasizing	

2	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
	x	x	x	x	x	x	x	x	x	x
3	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
	x	x	x	x	x	x	x	x	x	x
4	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
	x	x	x	x	x	x	x	x	x	x
5	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
	x	x	x	x	x	x	x	x	x	x
6	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
	x	x	x	x	x	x	x	x	x	x

Generally in all 10 question papers analysed, the formation of questions falls into traditional wordings such as discuss, describe, state, explain etc. No QRF could significantly be identified. There are perhaps in some parts of the questions, vague and non-productive elements insensitive to QRF is visible. Though not feasible in realizing entrepreneurship skills and mindsets, some memory based superficial pieces of knowledge are tested.

the analysed four questions above taken from the suggested ‘ideal question paper’ (see annexure (i) amply demonstrate the characteristics (in this discussion, the authors would like to identify them as Quality Reflection Factors –QRFs- for written question papers to be exact, ideas, imaginations, initiatives, creativities and innovations, knowledge and understanding (reasoning), attitudes and interests, thinking, and exposures of entrepreneurship related subjects).

In contrast, for convenience, the first six questions of 10 selected question papers (see annexure (ii) are analysed against the QRFs identified for question papers.

Q	Observations									
Question Number	Availability of QRFs in Question papers studies Ideas (QRF1), imaginations (QRF2), initiatives (QRF3), creativities and innovations (QRF4), knowledge and understanding (reasoning) (QRF5), attitudes and interests (QRF6), thinking (QRF7), and exposures (QRF8), other (QRF9)									
1	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
	x	x	x	x	x	x	x	x	x	x

VII. Conclusion

It is evident that while inclusion of entrepreneurship into curriculum as separate subjects or topics in some subjects is visible to some extent, the entrepreneurial discussions are not integrated in an effective manner especially in the assessment modes of written papers. The most question papers subject to this study show that they merely test the memory of the concepts of entrepreneurship. Further, it shows that there is little integration of “teaching” entrepreneurial skills cross module wise. While the study focuses on the assessment mode of written paper, the study creates a research territory that has to be embarked on almost immediately so that intervention illustrated in (fig i) is imperative to face a reality that present global social and economic trends demand from the field of higher education

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About Author (s):

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Annexure (i) -Question Paper 01: that could be considered as a bench mark which possesses the characteristics that would contribute in inculcating and gauging entrepreneurial skills in students.

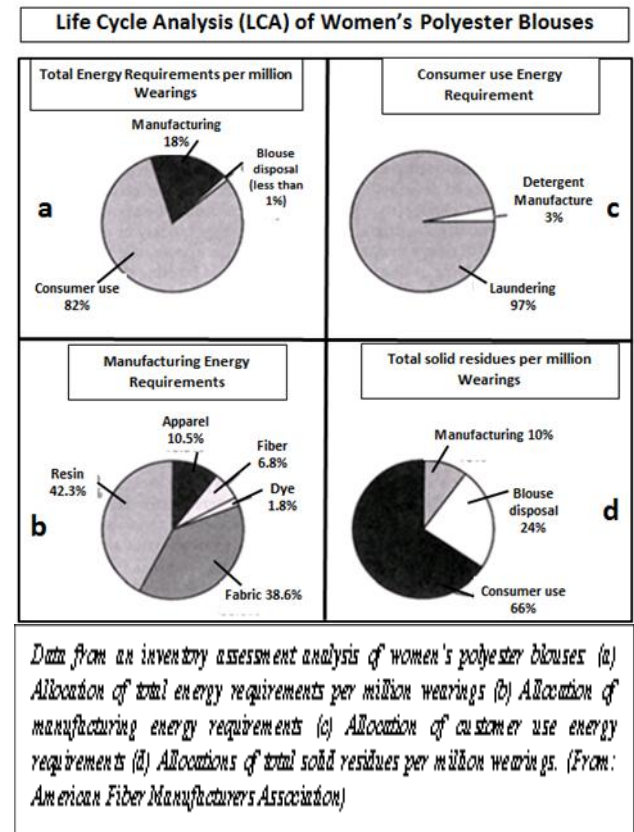
Question (i)

Life-Cycle Assessment (LCA) – also called Life-Cycle Analysis – is a tool for examining the total environmental impact of a product through every step of its life – from obtaining raw materials all the way through making it in a factory, selling it in a store, using it in the workplace or at home, and disposing of it. (Bishop, 2000, p. 252)

The below chart, Figure Q.01, shows some energy and waste quantification results of “Life Cycle Assessment of Women’s Polyester Blouses”. Answer the following, based on the Fig Q.01 charts.

- What is the energy requirement percentage related to the manufacturing process? [03 Marks]
- What is the energy requirement percentage related to consumer use? [03Marks]
- Why is there an energy requirement for blouse disposal? [03 Marks]
- Assuming there is an ecofriendly washing machine with 50% of energy reduction during the laundering, what would be the potential saving percentage of energy referring to the total energy requirement per million wearing? [04 Marks]

- If the country is importing such polyester blouses for the use of local women, and then if the LCA is limited to the usage and disposal,
 - What is the percentage reduction of energy requirement? [03 Marks]
 - What is the percentage reduction of solid residues? [03 Marks]
- Suggest six ideas which could be used to minimize the environmental impacts of this “Life Cycle Assessment of Women’s Polyester Blouses”. [06 Marks]



Question 02:

Rice is the staple food (main food) in Sri Lanka. The process of cooking rice is taken place daily in over a million houses. Saving energy and water in rice-cooking, and the thoughtful consumption of rice, with no excessive consumption or waste, as a good practice that contributes to a national level positive impact for the food security, environment, human health and wellbeing, and sustainability.

- If you think of adapting “Cleaner Production” in domestic level rice cooking (rice cooking at home), you may consider the effective use of Energy, Water, and Rice (as raw materials) as well as the minimization of other relevant environmental impacts, and review the rice cooking process in detail, and provide your ideas, suggestions, important points and strategies, policies, etc. You may consider your scope of cooking rice, from purchasing rice to consumption and disposal.

[08 Marks]

-

Construct a poster, or draft a voice (audio) clip, as an attempt to make a public awareness, of the national importance of the responsible cooking and consumption of rice. [08 Marks]

iii.

STEAMing (Science, Technology, Engineering, Arts, and Math combined approach) can be identified as a successful approach on dealing with challenging problems and issues associated with Environmental Management and Cleaner Production. Referring the above 2.1 and 2.2, justify the effectiveness in the approach of STEAMing.

[09 Marks]

Question 03:

The knowledge of “Environmental Management and Cleaner Production” should not be limited to concepts and memories. This knowledge should come to live (to be real) and should contribute for the benefits of the socio-economy; environment, health and wellbeing, and for the overall sustainability. Any business entity, industry, institution, organization, and even individuals like us, routed with (based on) the attitudes of live practicing of the knowledge of “Environmental Management and Cleaner Production”, such individuals and organizations are blessings for countries and nations.

Being wise, pro-active, and forward, even we can move the boundaries and limits of “Environmental Management and Cleaner Production”. With this mindset, we can be the true leaders, innovators, Entrepreneurs, Managers, Professionals, and overall great citizens with greater values. With the above in mind, answer questions 3.1 and 3.2 given below.

i..

Non-communicable diseases like diabetic, high blood pressure, kidney diseases, etc. that are threatening the health and longevity of humans are mainly caused by their own food habits and life styles. With that, even stress can be attributed to life styles.

Considering the saying “Food is a medicine”, promotion of fruit, herb, spices, mushrooms, and plant based derivatives as organic supplements for boosting the nutrition based immunity can be a greater strategy to address national health issues. This supplement can be a food, snack, beverage, powder, tea, pill, tablet, drop, etc. Such similar products can be developed based on “Hela and Ayurveda recipes”. Even exporting of such products can be worthy for the world and would bring us high quality revenues.

a. Based on your general knowledge, and also on imaginations and experiences, provide one product development concept or idea, together with business and entrepreneurship imaginations.

[07 Marks]

b. Outline the packaging and the label for the final product intended for exports, including the price in US\$ as you feel. [06 Marks]

ii.

Discuss the following, in brief, with a focus of “resource preservation and value added sales and exports”, Greening, and Sustainability, etc.

a. Leasing out our valuable natural minerals and other resource deposits like Graphite, Phosphate, to foreign companies as basic raw material exports. [03 Marks]

b. Strict law enforcement for the fullest possible usage of land and gardens for greening and cultivation. [03 Marks]

c. “Exporting of clay roof tiles” against the “Exporting of elegant high priced innovative glamorous products made of the same clay as the base material” [03 Marks]

d. Promoting and modernizing public transport and improving road networks to help for the country’s sustainability. [03 Marks]

Question 04:

Usage of thermal appliances (for heating and cooling) including, refrigerators, Air-conditioners, electric irons, water heaters, ovens, hair dryers, as well as cooking appliances are relatively a bigger portion of the national level energy consumption, when comparing with industrialized countries. And effective usage of energy and resources with minimum or no waste is considered important. Such thermal processes and equipment can be seen in the industry as well. Cleaner production, though its focus is mainly related to industry, a similar focus can be made for domestic levels (house level), especially like Sri Lanka with less industries and exports.

In view of the above, the general and useful knowledge of energy, heat transfer, and thermodynamics can be considered as essential for the “Environmental Management and Cleaner Production” application for both industrial and domestic levels. In view of the above,

i. In a refrigerator, explain the importance of insulation, and efficient refrigeration system. [05 Marks]

ii. As a user, write down the best practices in the using of refrigerator in terms of energy, and environment.

[03 Marks]

iii. In rice cooking, using of “a hot plate and a pan” and “a good rice cooker”, explain, which application can be considered as more environmental-friendly, in terms of energy consumption? [06 Marks]

iv. Slow cooking can be considered as the best practice of preserving the nutritional quality while cooking. Also such processes can be used with a low (reduced) capacity burner or a heater.

a. Slow cooking can be considered as always undergoing “Pseudo equilibrium” conditions, against the fast cooking techniques like the use of a pressure cooker. What is the meaning of this “Pseudo equilibrium” as practically felt? [03 Marks]

b. Briefly review and compare cooking rice using 3 techniques (1 clay-pot 2 Metal pot, 3 Pressure-cooker), in terms of energy, cooking quality, and the raw rice consumption. [08 Marks]

Annexure (ii) A conventional question paper

Question 01.

- a. Distinguish Entrepreneurship and Entrepreneurship using examples. (05 Marks)
- b. Discuss briefly, the Socio Economical impact of healthy entrepreneurship in Sri Lanka. (07 Marks)
- c. Explain innovation, invention and technology entrepreneurship? Give examples. (03 Marks)
- d. Who is an entrepreneur? How do entrepreneurial roles change from managerial roles? (05 Marks)

Question 02.

- a. State, which category of entrepreneurship, the following scenarios address from the perspective of an employee working for an organization. (Entrepreneurship, Intrapreneurship, Engineering Entrepreneurship)
 - i. Propose a training gap filling programme after doing a survey on employee performance in your organization
 - ii. Supply 1000Kg of Ginger every month to Ceylon Cold Stores PLC, based on an agreed contract. (semi processed ginger). Because you have ginger plantation.
 - iii. Introduce a Solar cooling helmet to industry
 - iv. Undertake orders for home and office Interior decoration
 - v. Produce creative crafts by using disposed office materials and sell them at convenient price for office members. (10 Marks)
- b. What do you mean by Supply chain? Explain the different types of entrepreneurial opportunities arise in the supply chain (06 Marks)
- c. What is forward and backward integration in supply chain? (04 Marks)

Question 03.

- a. What is a business opportunity? (03 Marks)
- b. Explain in what ways the entrepreneurial opportunities arise. (07 Marks)
- c. Identify and describe two (02) entrepreneurial opportunities that can be exploited in Information and Communication Technology (ICT) Industry (04 Marks)

Question “d” and “e” are based on the Business plan prepared for continuous assessment

- d. Rationalize the proposed product/service of the Business plan. (03 Marks)
- e. What is your target customer/Market? What are the close alternatives that they currently use instead of the proposed product/service? (03 Marks)

Question 04.

- a. Name three types of entries. Explain those in brief using examples. (06 Marks)
- b. What are the entry barriers faced by new ICT related ventures in Sri Lanka? (05 Marks)
- c. According to ‘ANSOF’ matrix of market strategy, how do you differentiate “Product development” and “Diversification” ? (05 Marks)

- d. Write four (04) social /technological trends that entrepreneurs should look into in the modern world (04 Marks)

Question 05.

- a. As per Porter’s Five forces model, determine the level of attractiveness of the industry in the following circumstances
 - i. Threats of new entrants are high
 - ii. Supplier’s bargaining power is low
 - iii. Competitive rivalry is high
 - iv. Buyer’s bargaining power is low
 - v. Substitute products are available in market (10 Marks)
- b. Explain five types of resources that an organization possesses (05 Marks)
- c. What are the characteristics that a resource should own to gain competitive advantage in the face of intense rivalry? (05 Marks)

Question 06.

- a. Explain the entrepreneurial process using a suitable model. Identify what factors affecting starting a new venture. (10 Marks)
- b. With time, the total customer offering created by a product decreases as per the nature of product life cycle. Draw a typical product life cycle highlighting each stage in it. State what is marketer’s role at each stage