INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR
Mid-Autumn Semester 2018-19

Date of Examination : _____ **Session (FN/AN)** _____ **Duration** 2 hrs
Subject No. : EP 60022_____ **Subject Name : TECHNOLOGY ENTREPRENEURSHIP**
Department/Center/School : RMSoEE _____
Specific charts, graph paper, log book etc., required _____
Special Instructions (if any) : _____

1. a) Annotate the purpose of a Business Plan for a new venture and (b) explicate the features in a Technology B-Plan [1+3]

2. a) "Product Development Process in the context of an entrepreneurial venture needs due attention" - Explain and (b) illustrate its steps. [2+3]

3. Elucidate the 'five pillars' of entrepreneurship, illustrating the 'Business Model Canvas' in the context of an engineering business. [3+2]

4. a) Discuss the utility of 'Process Capability Assessment' for the entrepreneur in selecting appropriate product realisation process. b) Describe the index, Cpk with a numerical example for a quantifiable assessment, as used for manufacturing of a technology product. c) Also explain the significance of indices, Cpm and Cpkm. [1+2+3]

5. Determine the expected duration the entrepreneur will need for a technology project based on the following information? [4]

Activity Description	Activity		Name of the Activity	Time Required (Weeks)		
	Event	Event		Optimistic	Most Likely	Pessimistic
Product Planning/ Inception	1	2	A	5	6	8
Market Research	1	4	B	2	3	4
Production Analysis	2	4	C	1	2	3
Product Model	2	5	D	3	4	7
Sales Brochure	2	3	E	1	2	5
Cost Estimate	4	7	F	3	4	6
Testing	5	7	G	4	5	7
Sales Training	3	6	H	2	2	3
Pricing	6	7	I	1	1	2
Production Review	7	8	J	1	1	1

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6. A techno-entrepreneur has developed an electronic product that consists of three components, P, Q and R which are sequentially arranged in series. The reliability and corresponding cost of each component are provided in the following Table. A modified version (Q') is planned for development through R&D. Maximum two components of an element can be put in the product-system. For example, it may be accommodating Q or Q' or QQ or QQ' or Q'Q'.

Find the best economic configuration of the product-system, if
i) Sales price is INR 2950 where the product reliability is greater than or equals to 0.6
ii) Sales price is INR 3050 where the product reliability is greater than or equals to 0.65.
Cost of product includes electronic packaging, material and labor. Labor cost is paid as INR 100 per component used in the product. Electronic packaging cost varies depending upon configuration. Electronic packaging cost using each component once (that is P+Q+R) is INR 500. Packaging cost gets doubled when additional components (such as any version of Q) are configured in the product.

Component	*Reliability*	*Cost (INR)*
P	0.8	500
Q	0.7	300
R	0.85	400
Q'	0.9	450

An investment in R&D is made worth INR 3 lakh, for the purpose, as stated above. It is obvious that reliability factor and sales price are to be considered together. Find the best configuration and determine the annual sales volume to keep the payback period as one year. [2+2+2]