

CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY (CHARUSAT)

Master of Business Administration (MBA)

Post Graduate Diploma in Management (PGDM)

Semester –IV University Examination – May 2019

MB926.3 Project Quality Six Sigma Management

Date: 15.05.2019, Wednesday Time: 01:30 PM to 01:50 PM Maximum Marks: 10

Student's ID No.									
Student's Name: _____									
Student's Sign : _____									
Supervisor's Name : _____									
Supervisor's Sign: _____									

Important Instructions:

- All questions are compulsory.
- There are two sections in the question paper. Section – I contains Q. No.: 1 which is of 10 marks and Section – II contains total five questions. Q. No.: 2 to 5 are of 10 marks each and Q. 6 is a Case study of 20 marks.
- Section –I of the question paper is a *closed book examination*. Whereas Section – II is an *open book examination*.
- Section – I should be answered in the given question paper and Section – II should be answered in a separate answer book.
- Maximum time allotted for Section – I is 20 minutes. Answer Book for Section – II will be given when the Question Paper for Section – I is returned. However, candidates who complete Section – I earlier than 20 minutes, can collect Answer Book for Section – II immediately after handing over Section – I question paper.
- Figures on the right indicate marks for each question.

SECTION – I

Q-1 Answer the following multiple choice questions (a – j): **10**

- a.** What does DPMO stand for? **[01]**
- a.** Dedicated Production & Manufacturing Output **b.** Defects Per Million Opportunities
- c.** Defects Per Manufacturing Output **d.** Defects Per Manufacturing Opportunities
- b.** Organizations forming successful cross-functional teams during the planning stages often have a formula include the following EXCEPT: **[01]**
- a.** a detailed 'roles and responsibilities' document that is tailored to cross-functional teams **b.** team members who can anticipate both cultural and practical processes complications
- c.** an experienced project manager who has limited exposure to cross-functional teams **d.** business units that are flexible enough to provide support to cross-functional teams
- c.** David's team of architectural engineers is prompted by managers to gather Key Performance Indicators (KPIs) for their next project. What is the process whereby project KPIs are set against internal and external goals? **[01]**
- a.** kaizen **b.** benchmarking
- c.** data gathering **d.** organizational restructuring
- d.** In product development and design, it is important to document and analyze all the ways that a product design would fail in real life situations. The goal of DFMEA in Six Sigma methodology is to uncover those instances where _____ occurs. **[01]**
- a.** failure mode **b.** failure milestones
- c.** function model **d.** function milestones

- e. PEAK Inc. is a large medical facility offering advanced radiological services. Executives are interested in computing the median age of men seeking full diagnostic imaging. As a measure of central tendency, where is the median point located? **[01]**
- a. located at the midway point of outlier points b. located at the midway point of the upper 50% and lower 50% of data
- c. located at the midway point of the most frequent data d. located at sum of differences between the mean & individual data points
- f. Richard's Enterprise Resource Planning (ERP) project team members are spending increasingly less time on value-added tasks. As a result, the project's productivity is declining. What is this an example of? **[01]**
- a. over-commitment b. under-commitment
- c. ERP creep d. scope creep
- g. Root Cause Analysis (RCA) is considered to be a _____ type of accident analysis. **[01]**
- a. reactive b. reflective
- c. proactive d. probative
- h. Quality control at a software production assembly line chooses samples for study from every 25 units produced within the day shift. At the end of a single production cycle, they are expected to analyze 200 units for defects. What is this type of sampling called? **[01]**
- a. Probability sampling b. Non-probability sampling
- c. Continuous sampling d. Fixed-rate sampling
- i. Following completion of her Six Sigma training, Stacey is responsible for Six Sigma implementation across the organization, integrating the knowledge she has gained while mentoring Black Belts. Stacey's role is: **[01]**
- a. executive leadership b. champion
- c. green belt d. yellow belt
- j. Six Sigma business management strategy was started in 1981 in an effort to streamline and improve the effectiveness of business and manufacturing processes. Which company originally developed Six Sigma? **[01]**
- a. Microsoft b. General Electric
- c. General Motors d. Motorola

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SECTION – II

Note: Please read the instructions (provided / given / written or oral) carefully before writing the answers.

Instructions:

- (i) *Section – II of the paper contains five questions.*
- (ii) *All questions are compulsory.*
- (iii) *This section of the question paper is an Open-Book Examination.*
- (iv) *Candidate may use only the prescribed text and / or reference books. Use of any other materials like handwritten notes, photocopy items, electronic gadgets / items, etc are strictly prohibited and upon contravention of the same, the candidates may not be allowed to undertake / continue the exam and if, found guilty, may invite punishments under relevant provisions of Unfair Means (UFM) / malpractices and / or as per University rules and regulations framed from time-to-time.*
- (v) *Candidates will have to bring with them the relevant text / reference book(s) (either their own or borrowed / issued from Institute / University Library) which shall not have any hand-written / typed contents including markings, diagrams, etc and other than those printed or published by the publisher as a part of the text / reference book. The institute reserves the right to seize the materials and debar the examinee from undertaking the examination. The institute will not be responsible for any loss or damage(s), etc to any materials / items possessed by the candidates.*
- (vi) *Candidates shall have the option to take the relevant text / reference book(s) within First Ten (10) Minutes of the Starting of the Examination.*
- (vii) *During Examinations, Candidates are not allowed / permitted to:*
 - a. *exchange of text / reference books, question paper / answer sheets, notes, or any other materials, etc in the exam hall,*
 - b. *go outside the exam hall,*
 - c. *access library facilities,*
 - d. *make any verbal or non-verbal communications, and*
 - e. *write anything on the question paper other than Candidate's ID / Seat Number.*
- (viii) *Candidates are advised to use the allotted exam time effectively and efficiently.*
- (ix) *Candidates are informed that open-book examinations generally test the candidate's aptitude and understanding about the course / subject or topics etc and simply copying or reproducing contents / texts from the text / reference book(s), will not result in awarding / rewarding of marks or grades.*
- (x) *The assessments / evaluation of answers are done on the basis of candidate's ability to write answers by applying various concepts that are learned as a part of the programme / course(s) / interdisciplinary areas.*
- (xi) *Candidates are requested to cooperate with the Invigilators / Sr. and Jr. Supervisor(s) / Exam Coordinators / Institute.*
- (xii) *Figures on the right indicate marks for each question. Each of the first five questions will carry 10 marks totaling to 50 marks. Question No. 6 is of 20 marks.*

Kindly return the Question Paper to the Invigilator upon the completion of the examination.

Q-2 Discuss the implementation of ISO:9000: 2000 quality systems. Also describe the type of documentation required for implementing ISO 9000 in an organisation and seeking registration. **10**

Q-3 *Case # 1* **10**

You have recently joined as Manager, Quality Control in a leading Electric Car manufacturing Factory, near Sanand established in 2014. Now (as instructed by your GM) design, construct, display and submit a model House of Quality (HOQ) as a Report for your Firm for its new 'single battery car' Model to be released in 2017. Your HOQ Report on the new Model Car must incorporate the HOQ steps, stages and methods with suitable diagrams, to enable and Implement the Quality Function Deployment (QFD) concept successfully.

Q-4 What are the core elements of an Environmental Management Systems Standard (EMC)? How could you develop an EMS based on ISO 14001? **10**

Read the below given case carefully and answer the questions given at the end: (Q – 5 -6)

Case # 2 # Orient Ltd.

Rahul Verma, Vice President (Operations), Orient Ltd., was confronted by a terrible dilemma. He had met CEO Abhay Shukla a few hours ago, and had been offered an additional responsibility: of coordinator Orient's Total Quality Management programme. But, instead of being enthused, Verma seemed a little hesitant. Nothing his reluctance, Shukla gave him a week to make up his mind. Verma's attitude was understandable. The TQM project had been coordinated by Bharat Saxena, vice-president, human resources management (HRM), until his recent exit from Orient. It was Saxena who had introduced TQM in the organisation a year-and-half ago, and, as a member of the apex committee which was piloting the project, Verma was fully aware of its chequered progress. A change of guard at this juncture could make or break his career. He decided to call Varun Mitra, who had taught him HRM and organizational development in college. For, Mitra, who was now a TQM consultant, would give him an outsider's perspective.

"It is an opportunity that I would have jumped at." Verma told Mitra as they met later. "There are several positive elements. The company is young; the people are enthusiastic; and the rank and file are receptive to change. The CEO has assured me of his personal support. But I have an uneasy feeling the whole thing. It could be something to do with the false starts we have had in implementing TQM." Mitra became alert. "False starts?" he asked. "They mean trouble. They often turn the clock backwards. But let us start at the beginning. Tell me about Orient. And why the company thought of TQM."

"We make paper-insulated cables, polyvinyl chlorine cables and cross-linked polyethylene (XLPE) cables. They come in a varied range --- low-voltage cables of up to 11 kilovolts (KV), medium-voltage cables of 33 KV, and high-voltage cables of 230 KV. We are, in fact, the only company in India to make 400 KV cables. Orient has a technical collaboration with Jigucji of Japan, which has given us access to their quality manuals. We have kaizens and quality circle in place, and obtained an ISO 9000 certification. With a 17 per cent market share, we rank second in the cable industry."

"That is quite impressive. You have the right ambience for TQM," said Mitra. "Now tell me about the motivation. Who are your customers?" "We are largely dependent on the State Electricity Boards (SEBs) for the off take of our products. The main problem with SEBs has been the collection of receivables, which takes anywhere between six months and one year. There is little on prices, which are negotiated annually, We are compelled to absorb hikes in input prices since there is no provision for an escalation clause in the agreement. But the biggest constraint is the fluctuation in the prices of raw materials like copper and aluminum, 70 per cent of which are imported. Evidently, the only way to get a grip on the costs-revenues-margins chain is to tighten up production processes and secure efficiencies in internal operations. That was why we thought of TQM."

"That is the classic trap that most companies fall into," said Mitra disapprovingly. "There is no link with the customer. The raison d'etre of a TQM movement is customer satisfaction. Without the linkage it becomes merely process oriented. Without the big picture, you would only be pursuing incremental improvements in operational efficiencies. You would not be aiming for geometric leaps in business results."

"I stand corrected," said Verma instantly. "I must mention that the decision to go for TQM was also influenced by the emergence of a new marked category --- industrial power cables --- in the last three years. We have been selling nearly 30 per cent of our output to the industrial sector through a dealer network. The share of industrial power cables in our turnover is likely to go up to 50 per cent in two years. The specialised TQM requirements of industrial users have ensured higher margins. Although the dealer happens to be our customer, we are now talking directly to end-users to ascertain their needs. We have developed customized products for several of our customers. So, the TQM movement did have its origin in the needs of a growing customer segment."

THE CHALLENGES OF TQM

Change Driver: Orient dearly needs to provide a compelling need for transforming the organisation. | **Leadership:** The change initiative needs the backing - and personal investment -- of its CEO. | **Customer Focus:** Orient needs to shift to a customer-oriented mindset from a process-oriented one. | **Employee Involvement:** To drive TQM, it needs to secure the buy in of middle managers first. | **Team Culture:** A quality transformation like TQM is primarily a team effort, not an individual initiative. | **External Intervention:** An external agent is extremely important to prepare Orient for change.

Overall Objective: Orient should synergies its subordinate goal with various operating goals.

"The link is still not wholesome," said Mitra. "But tell me, how did you go about implementing TQM processes?" "We began by asking ourselves several questions," said Verma. "What does the customer want? The answer was self-evident: a high-quality output a competitive price. What drives prices? Raw material costs, interest, and employee costs. What is the most critical issue that merits management attention? Reducing the lead-time of the production cycle by bringing down the downtime for imports of copper and aluminum. All that was part of an attempt to identify processes that would give us a tight control over costs. Simultaneously, we started looking at the key result areas: commodity-trading skills that would enables to make timely purchases of copper and aluminum and inventory and receivables management."

"Good start," said an enthused Mitra. "Tell me how TQM was co-ordinated." "We did not enlist any external consultants except for some of the training programmes," continued Verma "The vice-president, HRD, and had some experience in TQM in his earlier job. He was also a qualified trainer. That helped we formed an apex committee, headed by Saxena." "A basic mistake," intervened Mitra. "The apex committee should have been headed by the managing director with the vice-president HRD action as the convener."

"On hindsight, yes," said Verma. "The committee would meet once a month with a structured agenda. The idea was to examine the feedback on some of the internal training programmes we had initiated on team-building, of continuous improvement programmes, and experiential workshops. We had also started computing the cost of poor quality, and some of the tasks of the apex committee was to keep track of such costs regularly. We had a cascading organisation structure for TQM, wherein the vice-president, HRD, was the head of the apex committee, and each member of the apex committee was the head of a sub-committee pertaining to his department. For example, I headed the Operations sub-committee for TQM." "You seem to be, by and large, on the right track" said Mitra, " But why are you in two minds about accepting the offer?" "You know, the CEO's intentions are right, But I don't think about the kind of change he wants. TQM needs he is clear sustained backing of the CEO. The change initiative must be the personal responsibility of the CEO; the role of the coordinator is merely to facilitate change Shukla has not spelt out the factors that drive him personally towards TQM. If he withdraws the mandate at a later stage, overtly or covertly, the change process would collapse. That is my biggest concern."

"Secondly, as I said earlier, we have had some false starts. Let me give two examples. After some initial hesitation, which was quite natural, people at Orient were enthused with the team concept. Everybody plunged into the new style of working and a number of small-improvement projects took off. Once the team members got to the root of a problem that they were asked to solve, they became confident. They believed that any problem at any level in the organisation, however formidable, could indeed, be tackled. Surprisingly, Orient's line managers started feeling uncomfortable. When teams were uncovering major problems and people went around seeking information from sources they had no access to earlier, the line managers felt that the

situation was getting out of control. Lone used to screening information before it went outside their departments, they found the new openness quite daunting. The result? Departmental heads started pulling out their subordinated from various cross-functional teams on seemingly-valid grounds. These cross-functional teams on seemingly-valid grounds. This led up to a backlash. Employees felt bitter at having their hopes raised only to be let down. Perhaps the mistake lay in not securing the buy in of line managers' right at the beginning of the programme.

"Another example is with regard to our capacity utilization. As we started developing customized products, Orient's capacity utilisation level started falling. It fell from 80 to 45 per cent within the first five months. When you cater to customised demand, an increase in cross-sectional area and voltage requirements of finished cables become the new value drivers, not output as measured by cable length. The overall output measured by tonnage of metal drawn would increase, but the output in terms of kilometers of cables --- the conventional measure of capacity utilisation --- would decrease. It took time for indicator of the productivity of fixed assets in customized manufacturer. But the decline in plant capacity was attributed to TQM.

The third reason for my apprehension: TQM co-ordination is, essentially, a staff role --- and not a line function. And I am a line manager. In my 20 -year-long career, I have been used to issuing instructions and commanding action by allocating responsibility and ensuring accountability from people on the Shop floor. I am used to chasing results on a day-to-day basis. It is a mindset unsuited to a staff function like TQM, where the role of a co-ordinator is not to hand out instructions, but into facilitate change through a slow and steady process of individual transformation. I have seen it happen in many companies: any attempt by a staff functionary to chase results is doomed to fail."

"Perhaps you are over-reacting," said Mitra. "Let me address each of your concerns. The best way to ensure the continuing support of your CEO is to make him the sponsor of the apex committee. The false starts are, of course, alarming. You should have factored in these changes right at the beginning. The only way of undoing the damage is through training. Your line managers, in particular, must be put through development sessions. And there is no reason why you can't hold on to two contradictory roles simultaneously. It depends on the kind of person you are. Three issues are relevant here: are you likely to be biased towards your own traditional function? You should avoid giving too much attention to Operations in implementing TQM. Can you build trust among your people easily and establish your credibility with them without the backing of the authority? And, if the change process details for some reason do you still have a job at Orient? My own feeling is that you have a good opportunity to add value to the company."

"Thanks for your confidence in me," said Verma. "If I decide to accept the offer, are there any other specific issues that I should look at?" "Yes," said Mitra. "I think what Orient needs is a change driver. Something that provides a compelling need for change in the company. It could be a vision that is just out of reach unless a radically new thinking is applied, it could be some signs of decline within the company. It could be the fact that competition is closing in on you. If people do not see a fundamental reason for change, the leader's commitment, however genuine, may be discounted by them as one person's eccentricity. "I think it is also important for you to realize that TQM is not an employee motivation programme. Nor is it a panacea or a guarantee of success. In its very nature, a quality transformation is a team effort, and not everyone starts off with the same enthusiasm. Unless someone takes responsibility for masterminding the whole affair, either nothing gets done or there is complete chaos. This is where the skill and dedication of the change agent is a key success factor. You cannot succeed as a TQM co-ordinator if you are inclined to hogging the limelight. You have your priorities cut out at Orient. But the choice is entirely yours. All the best."

- Q-5** Analyse the given case from Total Quality Management perspective. Identify issues and challenges of implementing TQM in the given case. **10**
- Q-6**
- a. How can Orient CEO galvanize the organisation to bolster of quality and overall performance? What kind of approach would it need? **10**
 - b. How can Verma ensure that the quality movement will not be obstructed in the company? What roads map should Verma choose and why? **10**