FINAL EXAMINATION

GROUP IV

(SYLLABUS 2012)

SUGGESTED ANSWERS TO QUESTIONS

JUNE 2016

Paper-17: STRATEGIC PERFORMANCE MANAGEMENT

Time Allowed: 3 Hours **Full Marks: 100**

The figures in the margin on the right side indicate full marks.
This Question paper has been divided into 3 parts viz., Section-A (60 marks),
Section-B (20 marks) and Section-C (20 marks).

Please note:

- **From Section A: Performance Management, you are to Answer Question No. 1, which is compulsory, carrying 20 marks. Further answer *any two* Questions from the rest of the Question in this section, each carrying 20 marks.**
- **From Section B: IT & Econometric tool in Performance Management, your are to answer *any two* Questions, each carrying 10 marks.**
- **From Section C: Enterprise Risk Management, you are to answer *any two* question, each carrying 10 marks.**

SECTION A (60 Marks)

Performance Management

Answer Question No. 1, which is compulsory, carrying 20 marks.
Further answer* any two questions *from the rest of the questions
in this section, each carrying 20 marks.

1. Whirlpool Corporation is a leader of the $100 billion global home appliance industry. Infact, it is the World's leading manufacturer and marketer of major home appliances, with an annual sale of around $30 billion, with a man-power strength of about 80,000 and having 80 manufacturing and technology research centers around the world. Its main products are Washing Machines, Refrigerators, Dishwashers, Water-filters etc., Whirlpool is committed to a brand value creation strategy focusing on Innovation, Cost Productivity, Product Quality and Consumer Value. The company continues to improve its global operating platform to ensure that it is the best-cost and best-quality appliance manufacturer worldwide.

Whirlpool's supply chain has been transformed to better deliver products to its trade customers and consumers. The benefits of action are evident through a stronger network, increased efficiencies and timely deliveries.

Until recently, the company's strategic focus was on its products and brands. In recognition of environmental changes, attention was shifted to their supply chain and

how best to manage it. The need to focus on the supply chain was also instigated by major internal and organizational changes. Furthermore, it was recognized that two issues required attention:

(i) The desire for trade partners to hold lots of inventory (which impacted cash flows)

(ii) Customers needing their products quickly.

One of the goals constraining the redesign of their Supply Chain was to ensure that a customer's order could be fulfilled and delivered to the customer at the earliest.

The company set about its operations/supply chain strategy with the aim of improving cash flow, reducing costs, improved inventory management, improved customer satisfaction, improved cash flow and providing the right service to customers.

The first aspect of Whirlpool's strategy was the order process. Process, technology and inventory changes were made. Systems required replacement and integration with its system. Overall, there was a need to improve visibility within the supply chain.

Secondly, the company rationalized facilities, reducing the no. of buildings from 184 to 84. The company consolidated major warehouses into 10 regional distribution centers, resulting in cost savings of over $60 Million.

Thirdly, they optimized supply and demand with changes to demand planning models and Software and integration with upstream suppliers.

Required:

(i) Briefly state the importance of Supply Chain Management.

(ii) Describe the objectives of Supply Chain Management.

(iii) Describe the challenges that are faced by Whirlpool. What were the drivers for change to the Supply Chain?

(iv) What are the benefits of change to the Supply Chain?

(v) Describe the Whirlpool's Strategy? 4+4+4+4+4

Answer 1:

(i) Importance of Supply Chain management (SCM):

Supply Chain Management (SCM) is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate materials and finished goods and the distribution of these finished goods to the customers.

The concept of SCM is based on the core idea that every product that reaches an end user represents the cumulative effort of multiple organizations and collectively referred to as "Supply Chain".

SCM is the active management of Supply Chain activities to maximize customer value & achieve a sustainable Competitive advantage. SCM represents a conscious effort by the Supply Chain firms to develop & run Supply Chains in the most effective and efficient ways possible.

The Organization that make up the Supply Chain are "linked" together thru' Physical flows (that involves transformation, movement, storage of goods and materials) and Information flows (that allows various Supply Chain partners to coordinate their long-term plans and to control day-to-day flow of goods & materials up and down the Supply Chain). Physical Flows are the most visible part of Supply Chain.

Supply Chain Management has an important role to play in moving goods more quickly to their destination.

Managers these days recognize that getting products to customers faster than those of the competitors will improve the company's competitive position. To remain competitive, companies must seek new solutions to introduce SCM issues. Companies must face corporate challenges that impact SCM such as Re-engineering, globalization and outsourcing. Faster Product availability is the key to increasing Sales. Further, the ability to deliver a product faster also can make or break a sale.

Many companies are discovering that effective SCM is the best step now that must be

taken to increase Profit and market share.

(ii) Objectives of Supply Chain Management:

The following are the basic objectives of Supply Chain Management:

- Optimize the overall value created.
- Increase the Supply Chain Profitability
- Balancing the Demand and Supply.
- SCM takes into consideration that every facility that has an impact on cost and plays a role in making the product conforms to customer requirements: from supplier and manufacturing facilities through warehouses and distribution centers to retailers and stores.
- SCM is to be efficient and cost effective across the entire system
- SCM revolves around efficient integration of suppliers, manufacturers, warehouses and stores. It encompasses the firm's activities at many levels, from the strategic level through the tactical to the operational level.

(iii) Until recently, the company's strategic focus was on its products and brands. In recognition of environmental Changes, attention was shifted to their supply chain and how best to manage it. The need to focus on the supply chain was also instigated by major internal and organizational changes. Furthermore, it was recognized that two issues required attention:

(i) The desire for trade partners to hold lots of inventory(which impacted cash flows)
(ii) Customers needing their products quickly.
One of the goals constraining the redesign of their Supply Chain was to ensure that a customer's order could be fulfilled and delivered to the customer at the earliest.

The company set about its operations/supply chain strategy with the aim of improving cash flow, reducing costs, improved Inventory-management, improved customer satisfaction, improved cash flow and providing the right service to customers

(iv) The following are the benefits of change to the Supply Chain:

- To gain competitive advantage,
- Reduced Costs,
- Improved Inventory Management,
- Improved Customer Satisfaction and
- Improved Cash Flow.

(v) Whirlpool's Strategy:

The following were the different strategies adopted by Whirlpool:

- Changes in the Order process, Changes in the Process, Change of Technology and changes in the Inventory Systems were made. This was the first strategic impact.
- Changes in Supply chain to improve visibility.
- Whirlpool rationalized facilities. The no. of buildings were reduced from 184 to just 84.
- Consolidation of major warehouses to 10 Regional Distribution Centers. This resulted in huge cost savings.
- The Company optimized supply and demand with changes in demand planning models, Software changes and integration with upstream suppliers.

2. (a) A house-wife is looking at ways of producing domestic hot water and considers two possibilities on electric immersion heater, having an installation cost of `160 and an estimated annual electrical charges of `200 and a gas boiler, with an installation cost of `760 with an annual fuel bills of `80.

Assuming yourself as a consultant to the cost-conscious-housewife, advise her suitably by comparing two systems, on the basis of:

(i) total expenditure and
(ii) Present value, over a 5-year period. Take interest at 9%. 10

(b) What will be your recommendation, if you consider both the equipment for a 8 years period 10
(i) On total cost basis:
(ii) PV basis:
The PV factor @ 9% p.a. is as given below:

Year:	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
PV factor:	**1.000**	**0.9174**	**0.8417**	**0.7722**	**0.7084**	**0.6499**	**0.5963**	**0.5470**	**0.5019**

Answer:

2. (a) (i) Total Expenditure basis:

The total cost consists of the installation cost plus the electrical chages for 5 years.

a. Total Cost for the Electric Immersion Heater = ` 160 + `200 × 5 = `1,160.
b. Total cost for a gas boiler = `760 + `80 × 5 = ` 1,160,

Hence, on the total cost basis, both the equipments have equal preference and the house-wife can choose any one of the two alternatives.

2. (a) (ii) PV of money:

Let us now calculate the present value of money for each of the two possibilities:

Year	PV factor @ 9% p.a.	Electric Immersion heater		Gas- Boiler	
		Operating Cost (`)	Discounted cost (`)	Operating cost (`)	Discounted cost (`)
0	1.000	160	160.00	760	760.00
1	0.9174	200	183.48	80	73.39
2	0.8417	200	168.34	80	67.33
3	0.7722	200	154.44	80	61.78
4	0.7084	200	141.68	80	56.67
5	0.6499	200	129.98	80	51.99
			∑ = 937.92		∑ = 1071.96
			≈ 938		≈ 1071 (say)

On the basis of PV @9% p.a. over a period of 5 years, total cost of Electric Immersion heater is `938 and that of Gas Boiler is ` 1,071. Hence the house wife is advised to purchase an Electrical Immersion Heater.

2. (b) (i) If the equipment are to be considered for a period of 8 years, then

Total cost for Electric Immersion Heater	` 160 + 200 × 8	1,760
Total cost of Gas Boiler	`760 + 80 × 8	1,400

Hence, the house wife will be advised to purchase a gas Boiler.
Present Value in case of Electric Immersion heater:
PV over five years + PV over next three years = ` 938 + ` 329 = ` 1,267.
PV in case of Gas Boiler = `1,071 +` 132 = ` 1,203.
Hence, over an 8 year period, the PV of a Gas Boiler is less.
On the basis of total cost basis as well as PV of money, Gas Boiler is cheaper over the 8 years period. Hence the house wife is advised to purchase a Gas Boiler in the instant case.

3. (a) Seema Ltd., having a complex air-borne navigating system incorporates a sub-assembly, which unroll a map of the flight plan synchronously with the movement of the aeroplane. This sub-assembly is bought on very good terms from a sub-

contractor but is not always in perfect adjustment on delivery. The sub assembly can be readjusted on delivery to guarantee accuracy at a cost of `50 per sub-assembly. It is not, however possible to distinguish visually those sub-assemblies that need adjustment.

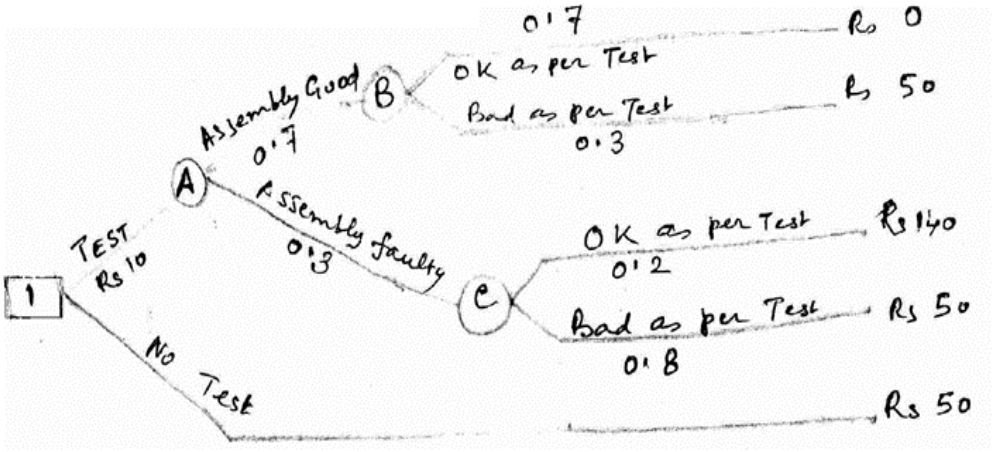
Alternatively, the sub-assemblies can each be tested electronically at a cost of ` 10 per sub-assembly tested. Past experience shows that about 30% of those supplied are defective, the probability of test indicate a bad adjustment when the sub-assembly is faulty is 0.8, while the probability, that the test indicates a good adjustment when the sub-assemblies is properly adjusted is 0.7. If adjustment is not made and the sub-assembly is found to be faulty when the system has its final check, the cost of subsequent rectification will be ` 140.

As a Management Accountant, draw up an appropriate Decision Tree to show the alternatives open to the purchaser and use it to determine his appropriate course of action? 10

(b) State the different types of Bench-marking, with a small write-up on each? 10

Answer 3:

(a) The required Decision Tree is as shown below:



Expected Monetary Value(EMV) at Node B = ` (0.7 × 0) +(0. 3 × 50) = ` 15

EMV at Node C = `(0.2 × 140 )+(0 .8 × 50 ) = `28 + 40 = `68

EMV at Node A = ` (0.7 × 15 + 0.3 × 68) = ` 10.50 +20.4 = `30.90

EMV of Node 1 via the Branch "Test" = ` (10 + 30.90) = ` 40.90

EMV of Node 1 via the branch "No Test" = `50.

∴Optimal EMV of Node 1 is `40.90 corresponding to the optimal decision " Test the Sub assemblies".

(b) Benching Marking:

Benching marking is the establishment - through data gathering of targets and comparatives, with which performance is sought to be assessed. After examining the firm's present position, benchmarking may provide a basis for establishing better standards of performance. It focuses on improvement in key areas and sets targets which are challenging but evidently achievable. Bench marking implies that there is one best way of doing business and orients the firm accordingly. It is a catching-up exercise and depends on the accurate information about the comparative company - be it inside the group or an outside firm. Benchmark is the continuous process of enlisting the best

practices in the world for the process, goals and objectives leading to world-class levels of achievement.

Types of benchmarking: The different types of Benchmarking are:

(i) Product Benchmarking (Reverse Engineering)
(ii) Competitive Benchmarking
(iii) Process Benchmarking
(iv) Internal Benchmarking
(v) Strategic Benchmarking
(vi) Global Benchmarking
(vii) Functional Benchmarking
(viii) Generic Benchmarking

(i) Product Benchmarking (Reverse Engineering): is an age old practice of product oriented reverse engineering. Every organization buys its rival's products and tears down to find out how the features and performances etc., compare with its products. This could be the starting point for improvement.
(ii) Competitive Benchmarking: This has moved beyond product-oriented comparisons to include comparisons of process with those of competitors. In this type, the process studied may include marketing, finance, HR, R&D etc.,
(iii) Process Benchmarking: is the activity of measuring discrete performance and functionality against organization through performance in excellent analogous business process e.g. for supply chain management.
(iv) Internal Benchmarking: is an application of process benchmarking, within an organization by comparing the performance of similar business units or business process.
(v) Strategic Benchmarking: differs from operational benchmarking in its scope. It helps to develop a vision of the changed organizations. It will develop core competencies that will help sustained competitive advantage.
(vi) Global Benchmarking: is an extension of Strategic Benchmarking to include benchmarking partners on a global scale. E.g. Ford Co. of USA benchmarked its A/c payable functions with that of Mazda in Japan and found to its astonishment that the entire function was managed by 5 persons as against 500 in Ford.
(vii) Functional Benchmarking: An application of process benchmarking that compares a particular business function at two or more organizations.
(viii) Generic Benchmarking: An application of functional process benchmarking that compares a particular business function at two or more organizations, selected without regard to their industry.

4. (a) Karishma Ltd., manufacturing electronic equipments, is currently buying component A from a local supplier at a cost of `30 each. The company has under its consideration a proposal to install a machine for the manufacture of the component.

Two alternative proposals are available as under:

- **Installation of Semi-automatic machine, involving an annual fixed cost of `18 lakhs and a variable cost of `12 per component manufactured.**
- **Installation of an automatic machine, involving an annual fixed cost of `30 lakhs and a variable cost of `10 per component manufactured.**

As a Cost and Management Accountant, you are required to find out:

(i) The annual requirement of the component to justify a switch over from purchase of components to
(a) manufacture of the same by installing semi-automatic machine and
(b) manufacture of the same by installing an automatic machine.
(ii) If the annual requirement of the component is 5,00,000 units, which machine would you advice the company to install? 10

(b) Name the important Key Performance Indices (KPI) that should be monitored? 10

Answer 4:

(a)

		Semi-Automatic Machine (`)	Automatic machine (`)
i.	Purchase price of the component	30	30
	Variable cost	12	10
	Saving	18	20
	Fixed Costs	18,00,000	30,00,000
	Components required to be produced to Justify	18,00,000 ÷ 18	30,00,000 ÷ 20
	The installation of the machine	= 1,00,000	= 1,50,000
ii.	If the annual requirement is 5,00,000 units:		
	Variable costs	60,00,000	50,00,000
	Fixed costs	18,00,000	30,00,000
	Total costs	78,00,000	80,00,000

Recommendation: Install semi-automatic machine, since it costs less.

(b) The following are some important Key Performance Indicators (KPI) that should be monitored:

(i) Stock turnover - days. Reflects the number of days that it takes to sell inventory. The lower the ratio means the quicker the stock is sold.

(ii) Debtors turnover - days. Reflects average length of time from sale to cash collection. The lower the ratio means the quicker that accounts are paid. From a cash flow perspective, it is important to keep days outstanding to a minimum.

(iii) Current ratio. Indicates the extent to which current assets cover current liabilities and is a measure of the ability to meet short-term obligations. The rough rule of thumb is a ratio of 2:1. That is for every ' 1 of liabilities (within 12 months), there should be at least '2 in current assets to meet such liabilities.

(iv) Debt/equity. This is a measure of the extent to which a business relies on external borrowings to fund its on-going operations. The higher the ratio, the more heavily that debt financing is used. In order to provide a reliable measure, assets should be valued at market value.

(v) Interest coverage. Provides a measure of the ability of the business to meet its interest commitments out of profits and is linked to the debt/equity ratio. The rough rule of thumb used by banks is a ratio of 3:1. That is, operating profit before income tax exceeding interest expense three times.

(vi) Return on investment. Represents the after-tax return that owners are receiving on their investment and should be compared with alternative forms of investment.

(vii) Gross profit margin. An indication of the profitability of the business and reflects control over cost of sales and pricing policies. This ratio should be compared with prior periods and to any available industry data.

(viii) Breakeven sales. Reflects the sales that need to be generated in order to cover expenses. In other words, this is the level of activity at which neither a profit nor loss is incurred, nor where total costs equate with total revenue. This is a very important ratio that every owner should monitor on a monthly basis.

Section - B (20 marks)
IT and Econometric tool in Performance Management
You are to answer any two questions in this section, each carrying 10 marks.

5. What are the Objectives of 'Six Sigma'? Write a few lines on each of these objectives. 5+5

Answer 5:

Objectives of Six Sigma: The basic Objectives of Six Sigma are:

(i) Overall Business Improvement:

Six Sigma methodologies focus on business improvement. Beyond reducing the number of defects present in any given number of products, a business employing Six Sigma methods must seek improvement through any means available. That means identifying and remedying problems wherever they occur. Six Sigma calls anything that damages business functionality in a way that increases defects, raises costs, slows productivity or reduces customer satisfaction a source of pain. The elimination or remediation of these sources of pain leads to overall business improvement.

(ii) Remedy Defects/Variability:

Any business seeking improved numbers must reduce the number of defective products or services it produces. Defective products can irrevocably harm customer satisfaction levels, as each customer ending up with a defective product becomes a potential lost costumer and because the displeased customer will tend to pass the word about this defective product along.

(iii) Reduce Costs :

Reduced costs mean increased profits. A company implementing Six Sigma principles has to look to reduce costs wherever it possibly can-without reducing quality. Cost reduction potential exists throughout a company. Acquire cheaper raw materials of equal or comparable value; reduce transportation costs via alternate shipping methods; streamline production and quality control processes with automation or improved equipment technology; cut personnel costs with outsourcing, downsizing or other methods; or reduce rent payments by moving production or sales facilities to different locations.

(iv) Improve Cycle Time :

Any reduction in the amount of time it takes to produce a product or perform service means money saved, both in maintenance costs and personnel wages. Additionally, customer satisfaction improves when both retailers and end users receive products sooner than expected.

(v) Increase Customer Satisfaction:

The sources of pain that Six Sigma methodologies seek to remedy interrelate. Customer satisfaction depends upon successful resolution of all Six Sigma's other objectives. But customer satisfaction is an objective all its own.

6. (a) What do you mean by the term 'Data Warehousing' (DW)?

(b) What is 'Data Mining'? Briefly explain. 5+5

Answer 6:

(a) **Data Warehousing (DW)**

Data warehousing is the science of storing data for the purpose of meaningful future analysis. Yes, it is a science (not much art involved!) and it deals with the mechanism of electronically storing and retrieving data so that some analysis can be performed on that data to corroborate support a business decision or to predict a business outcome. DW technologies provide historical, current and predictive views of business operations by

analyzing the present and historical business data. Data analysis is often done using visualization techniques that turn complex data into images that tells compelling story. Raw data by this process of analysis help management take right decisions. To further demonstrate the need of data warehousing, consider this. Let's imagine a company called "Fair Shop" that has 1000 retail outlets across USA. The company has built one data warehouse to store the data collected from all the shop outlets so that they can analyze the data to gather business intelligence.

The company collects raw sales data from all of their outlet shops (through a process called ETL) and then loads them into a place called data warehouse or data mart.

Once the data is there in data warehouse (or data mart) business intelligence techniques are applied to that data for analysis and reporting. Since the company now has the sales and purchase information from all their shops in a centralized place, it can easily use this data to answer some rudimentary questions about their business e.g. what shop makes highest sales, which product is most popular across the shop, what is the stock balance etc.

(b) Data Mining is a process of discovering various models, summaries, and derived values from a given collection of data. The word "process" is very important here. Even in some professional environments there is a belief that data mining simply consists of picking and applying a computer-based tool to match the presented problem and automatically obtaining a solution. This is a misconception based on an artificial idealization of the world. There are several reasons why this is incorrect.

One reason is that data mining is not simply a collection of isolated tools, each completely different from the other, and waiting to be matched to the problem.

A second reason lies in the notion of matching a problem to a technique. Only very rarely is a research question stated sufficiently precisely that a single and simple application of the method will suffice.

In fact, what happens in practice is that data mining becomes an iterative process. One studies the data, examines it using some analytic technique, decides to look at it another way, perhaps modifying it, and then goes back to the beginning and applies another data-analysis tool, reaching either better or different results. This can go round and round many times; each technique is used to probe slightly different aspects of data—to ask a slightly different question of the data. What is essentially being described here is a voyage of discovery that makes modem data mining exciting.

Still, data mining is not a random application of statistical, machine learning, and other methods and tools. It is not a random walk through the space of analytic techniques but a carefully planned and considered process of deciding what will be most useful, promising, and revealing. It is important to realize that the problem of discovering or estimating dependencies from data or discovering totally new data is only one part of the general experimental procedure used by scientists, engineers, and others who apply standard steps to draw conclusions from the data.

7. (a) Explain what do you mean by the term 'Dash Board'?

(b) Draw a Comparison between Dash Board and Score Card? 5+5

Answer 7:

(a) **Dash board**

In information technology, a dashboard is a user interface that, somewhat resembling an automobile's dashboard, organizes and presents information in a way that is easy to read. However, a computer dashboard is more likely to be interactive than an automobile dashboard (unless it is also computer- based). To some extent, most graphical user interfaces (GUIs) resemble a dashboard. However, some product developers consciously employ this metaphor (and sometimes the term) so that the user instantly recognizes the

similarity. Some products that aim to integrate information from multiple components into a unified display refer to themselves as dashboards. For example, a product might obtain information from the local operating system in a computer, from one or more applications that may be running, and from one or more remote sites on the Web and present it as though it all came from the same source. Hewlett Packard developed the first such product, which began as a tool for customizing Windows desktops. Called Dashboard, the HP product was subsequently acquired by Borland and then a company called Starfish. Microsoft's Digital Dashboard tool incorporates Web-based elements (such as news, stock quotes, and so on) and corporate elements (such as e-mail, applications, and so on) into Outlook. Dashboards may be customized in a multitude of ways and named accordingly, generally, for example as a general corporate or enterprise dashboard, or more specifically, as a CIO or CEO dashboard.

(b) **Comparison between Scorecard and Dashboard**

The two terms - scorecards and dashboards - have a tendency to confuse, or rather get used interchangeably, but each brings a different set of capabilities.

The sources of the confusion are: Both represent a way to track results.

- Both use traffic lights, dials, sliders and other visual aids
- Both have targets, thresholds and alert messages
- Both provide linkage or drill down to other metrics and reports.
- The difference comes from the context in how they are applied.

To provide some history, as busy executives and managers struggled to keep up with the amount of information being thrust at them, the concept of traffic lighting were applied to virtually any and all types of reporting. As technology has improved, more bells and whistles were added - the ability to link to other reports and to drill down to finer levels of detail. The common denominator was the speed of being able to focus on something that required action or further investigation. The terminology evolved to reflect how technology vendors described the widgets that provided this capability - dashboards. As a consequence, both dashboard and scorecard terms are being used interchangeably. Some refer to dashboards as "dumb" reporting and scorecards as "intelligent" reporting. The reason is dashboards are primarily for data visualization; they display what is happening during a time period. Most organizations begin with identifying what they are already measuring and construct a dashboard dial from there. However, dashboards do not communicate why something matters, why someone should care about the reported measure or what the impact may be if an undesirable declining measure continues. In short, dashboards report what you can measure.

Section - C (20 marks)
Enterprise Risk Management
In this section, you are to answer any two questions, each carrying 10 marks.

8. There are different recommendations to reduce the Risk of the Corporate Failures. Mention these recommendations. 10

Answer 8:

Recommendations to reducing corporate failures

It is a fact that some companies perform well and that some under-perform and some fails. In many, if not most cases, these companies are led by executives that are quite experienced. Below are some recommendations that can help to reduce the risk of failures of organizations:

Appointment of non-executive directors The non-executive directors will bring their special expertise and knowledge on strategies, innovative ideas and business planning of the organization. They will monitor the work of the executive management and will help to

resolve situations where conflict of interest arises. Overall, the nonexecutive directors will act as a Cross Check.

Audit committees Very often, there is occurrence of fraud in management and financial reporting. The presence of the audit committees will help to resolve this problem. Audit committees have the potential to reduce the occurrence of fraud by creating an environment where there is both discipline and control.

Development of environment learning mechanism Some organizations fail because they loose touch with their environment. Therefore, to counter this problem, there is a need to develop the environmental leaming mechanism. Through it, new information can be brought on continuous basis. This is mainly done by carrying customer-feedback surveys. In this way, the organization can realign itself with the new needs and challenges.

Focus on research and development Organizations can generate new knowledge by investing and focusing more on research and development. Thus, there will be more ideas how to make the products much better than that of their competitors.

9. Explain the Genetic Algorithm under the Corporate Bankruptcy Prediction Models. 10

Answer 9:

Genetic Algorithms (GA)

Based on the idea of genetic inheritance and Darwinian theory of natural evolution (survival of the fittest), GAs work as a stochastic search technique. GAs perform their search for optimal solution to the problem posed from a large and complicated space of solutions.

GAs are usually explained with the help of vocabulary, inevitably, borrowed from natural genetics. Each individual potential candidate solution to the problem is represented by a string' (also called chromosome', genotype' or structure'). These strings 'are made of units'(also called genes', features', characters', or decoders').

Under GAs, an evolution process is run on a population of strings' that corresponds to a search through a space of potential solutions. GAs execute this search process in three phases: genetic representation & initialization, selection, and genetic operation (crossover and mutation). Genetic representation that is normally in binary alphabet (0 and 1) creates an initial population of solutions. After the initialization, each string is evaluated with the help of a user-defined fitness function. Over time, such a selection process is likely to result into best performing strings only. Straightforward reproduction of selected strings entails no benefit in terms of exploration of solution space, as this will only reproduce the identical offspring's from the parent strings. Genetic operations of Crossover and Mutation are introduced for this purpose. The process continues until the actual population converges towards increasingly homogeneous strings. In general, the process is stopped when we are satisfied with a certain level of homogeneity.

In order to solve a classification problem like bankruptcy, researchers extract a set of rules or conditions using GAs.

These conditions are associated with certain cut off points. Based on these conditions, the model would predict whether or not a firm is likely to go bankrupt.

10. Discuss about the Risk Retention, Describe the guidelines to be followed for Risk Retention. 5+5

Answer 10:

Risk Retention

This denotes acceptance of the loss or benefit arising out of a risk when it takes place. In short, it is also termed as self insurance. This strategy is viable when the risks are small enough to be transferred at a cost that may be higher than the loss arising out of the risk itself. On the other hand, the risk can be so big that it cannot be transferred or insured. Such risks will have to be phased out when the eventuality occurs. War is an example as also are 'Acts of God' such as earthquakes and floods.

The reasons for risk retention can be cited as follows:

(i) While risk in a business is taken to increase its return, risk retention relates to such risks which

have no relation to return but are part of an individual's life or organization or a company operational risk can be cited as such a risk that is inherent and needs to be accepted for retention.

(ii) Sometimes, such risks are so small that they are ignored and/or phased out when they surface.

(iii) This method is also useful when the probability of occurrence is very low and a reserve built within the system over a period can take care of such losses arising out of risk retention. This is normally resorted to in businesses against credit risks that are inherent due to marketing on credit basis.

(iv) In some cases, the subject, who is susceptible to risk, also becomes fully aware of the nature of risk. In these situations, there is a certain amount of preparedness in the system due to risk retention.

Certain guidelines relating to risk retention should be followed, as per below:

(A) Determine the risk retention level through proper estimation of risk using sales projections, cash flows, contracts, liquidated damages, and guarantees.

(B) Though there is no precise formula for estimation of risks to be retained, statistical averages of such losses over a period of time give an indication to estimate such losses. For instance, bad debts occurring over a period of time are taken into consideration as an estimate to create a reserve for doubtful debts.

(C) It is also necessary to ascertain the capacity for funding a loss arising out of retained risk that is the measure for transferring the risk beyond that level. Risk retention as an exercise and a strategy is attempted mainly in the case of operational risk in business.