

PASSAGE - I : ANALYSIS OF BUSINESS SITUATIONS

Directions : This section comprises of two passages. After each passage, questions consisting of items relating to the proceeding passage are given. Evaluate each item separately in terms of the respective passage and choose your answer as per the following guidelines:

- (A) If the item is a **MAJOR OBJECTIVE** in making the decision; that is, the outcome or result sought by the decision maker.
- (B) If the item is a **MAJOR FACTOR** in arriving at the decision; that is consideration, explicitly mentioned in the passage that is basic in determining the decision.
- (C) If the item is a **MINOR FACTOR** in making the decision; a less important element bearing on a affecting a Major Factor, rather than a Major Objective directly.
- (D) If the item is a **MAJOR ASSUMPTION** made deliberately; that is a supposition or projection made by the decision before considering the factors and alternatives.
- (E) If the item is an **UNIMPORTANT ISSUE** in getting to the point; that is a factor that is insignificant or not immediately relevant to the situation.

PASSAGE - I

In 1976 officials of the Grace Fabri-Tool Company manufactures of special tools and presses for working with laminated plastic sheets such as Formica, Micarta, and Textolite were considering possible changes in the company's distribution channels. Ever since the company started in 1973, it had sold through laminated plastics distributors, Sales increased rapidly from the start, but profit were not satisfactory. This condition

resulted from the difficulties encountered by distributors in providing adequate field service.

In 1962 Mr. Robert Grace had first realised the difficulties that Formica presented to the fabricator. While working in his father's shop, he was often given the job of cutting Formica and bonding it to plywood and in time he developed considerable skill in handling the plastic material.

After serving in the armed forces and attending college, Mr. Grace decided to put his knowledge of Formica to good advantage. He persuaded the Formica Company to hire him to travel all over the country to show fabricators and cabinet makers improved methods of cutting and forming Formica sheets. As a demonstrator, Mr. Grace arranged meeting for distributors. Typically such a meeting would attract 50 to 500 people from the cabinet plants in the distributor's area. Each meeting lasted about two hours and was generally held in a hotel in which a shop had been set up for temporary use by Mr. Grace. Distributors found that a large number of their customers and prospective customers attended these meetings because most of them had little experience in working with laminated plastic sheets and were in need of aid. Following such a meeting, it was not uncommon for a distributor to experience a 30 to 35 percent in Formica sales.

After two years as a Formica demonstrator, Grace fell that Formica could be fabricated more efficiently if special tools and presses were available for that purpose. The officials of the company encouraged Mr. Grace to find someone to design and produce such tools and presses, but no manufacturer was interested in his idea. Therefore, Grace decided to form his own company to design and sell the tools and presses. After completing the designs in his own workshop, he engaged a tool manufacturer to produce them.

Grace Fabri-Tool Company was formed in 1973 and was the first to introduce a line of tools for working laminated plastic sheets, but Stanley and Porter-Cable were quick to follow. Even though specially made for working plastic sheets, these tools could also be used with other materials, including wood.

The types of operation used in working laminated plastic sheets were sawing, drilling, routing, bevelling bonding and forming. While all these operations shop tools, field experience indicated that carbide-tipped tools, such as those made by Grace, gave better results and lasted longer. However, such tools were about twice as expensive as ordinary carpenter's tools. Representative of the tools were the routing and trimming fixtures. The average price of the tools was about \$15.

Grace Fabri-Tool Company also sold bonding forming presses; the least expensive model initially sold for \$1,650.

The Grace Thermofast vacuum press used a heat process which saved a great deal of time over the conventional cold-pressure method of bonding plastic sheets (or other material such as wood veneer) to a second surface. Field tests indicated that the Grace press could complete in six minutes a bond that would require several hours using the cold-pressure method.

Forming presses were used to shape sheets of plastic in more than one plane. For example, in place of flat plastic covered kitchen counter top, it was not uncommon for a designer to specify an extension of the plastic sheet up the back wall and down over the front edge; or a slight ridge along the front edge counter top to prevent water from running off. Forming sheets in this manner required special presses which, because of their cost, could be purchased only by the large fabricators, who consequently did the bulk of this kind of work either on their own account or on a custom basis for smaller firms. Initially it was felt that the presses could be installed and operated with a minimum of instruction and would require virtually no service.

Mr. Grace was particularly fortunate in that the Formica Company continued to use his services, on an independent contractor basis for a period about

five months after he had formed his own company. Under this arrangement he continued as a demonstrator of Formica, but was paid according to the number of demonstrations made, rather than on a straight salary basis. This arrangement subsidised his selling efforts on behalf of his own products and brought him into direct contact with prosecutive distributors and final users of his products. He estimated that this support was worth \$10,000-\$12,000 and that it was instrumental in assuring the success of the firm at a critical stage.

In view of the above arrangement, Mr. Grace decided to sell his products through laminated plastic sheet distributors. He sent letters to 50 of them with the result that 40 sent in orders. They gave the company representation in most parts of the country. Laminated plastic sheet distributors generally sold only plastic sheets, plywood, adhesives and seam-fillers. However, some had taken on noncompeting items to serve their customers better. Many of the customer of the distributors were relatively unacquainted with the problems of working with laminated plastic sheets and welcomed any information or tools that would help them. As a result, the Grace Fabri-Tools were added to their lines by many distributors. Not only were they better able to service their customers' needs, but it was possible for their salesmen to call on customers with something new to talk about.

Distributor interest in Grace tools continued, since for some time a new tool was added to the line almost every month. Distributors' salesmen thus had a steady stream of new items to talk about as they called on their customers. As the number of new tools increased, the need additional ones decreased and in time the company ran out of ideas. This caused distributors' salesmen to lose their special interest in the Grace tools.

Prior late 1975, distributors aggressively sought business. However, the demand for plastic sheets became so great after that time that distributors took most of their salesmen off the road and had them use the telephone to take orders. Even with this arrangement distributor's sales of plastic sheets

increased as much as 30 percent in a year. But the sale of Grace products suffered from the lack of selling effort. Distributors spent most of their time taking orders for plastic sheets and trying to fill them. The search for funds to finance their operations became a major problem. This situation continued into 1976. However, there were some indications that it might again become necessary for distributors to get out and sell.

Sales of the Grace Company amounted to \$60,000 during the last six months of 1973. The following year they rose to \$350,000. Despite the sales increases, profits suffered as a result of field service costs. The company, belatedly recognising the need for field service on the presses and the inadequacy of distributors in this respect, leaned over backwards to remedy the situation.

By 1975 distributors found that service demands and complaints from buyers of presses were a problem. The buyer looked to the distributor to keep the press running. Yet the distributor usually had no facilities, and Grace was inadequately prepared to meet the service needs which developed. This situation resulted in long delays in completing service calls. Distributors had in the past been able to adjust customers complaints on the spot in as much as they involved small tools, adhesives plywood, and plastic sheets. Defects in these products could be detected easily and when necessary, the product could be replaced out of stock at a small cost. This was not possible, however, with a machine costing several thousand dollars and normally shipped by the manufacturer to the customer.

Flatbed presses were originally priced at \$1,650 on the assumption that service and repairs under the warranty would be a trivial expense to the company. Actual experience, however, indicated that claims made under the company's warranty could not be handled by letter or telephone and that satisfactory handling incurred expenses ranging from \$200 to \$300 per press. Moreover, redesign of the presses increased manufacturing costs from \$400 to \$ 500 per press. In setting a new price, the company decided to set it high enough to recover the added manufacturing costs

and the estimated cost of delivering, installing the equipment, training operators and handling service and repairs under the warranty. The new price was established at \$2,975. Many distributors felt that at this price the item was too expensive to handle. Some made no effort to sell it but continued to sell the smaller tools. Others voluntarily dropped the Grace products. With the adoption of the new installation and service policy it became necessary for the company to reconsider its distribution channels. Moreover, the desire to achieve broader distribution and more aggressive selling increased the need for reassessing existing channels.

Distributors discounts were cut from 20 percent to 10 percent of list price, except in those cases where the distributor was able and willing to handle, install, and service presses and to train operators. A discount was allowed anyone who bought for resale. However, no discounts were allowed on direct sales by the company to users, no matter how large. It was reasoned that a user would buy only what he required whether or not quantity discounts were allowed.

In 1976 the management felt that manufacturers representatives together with the remaining distributors would provide the desired coverage and selling effort. In investigating this possibility some difficulty was encountered in locating representatives who were regularly calling on prospective buyers of Grace products and who were not selling competing items. In some cases agents not calling upon potential buyers of Grace products were willing to do so and asked for the Grace line.

The representatives under consideration carried various other products. Several handled automotive items, one handled Kitchen cabinets and appliances, another handled noncompeting electronic gluing equipment and one with a very large territory was willing to handle Grace products exclusively. Some representatives for laminated plastic sheets also expressed interest in taking on Grace products. A representative was paid a 10 percent commission on all shipments of tools or presses destined for his area even those resulting from distributor effort. However, if a representative obtained an order for shipment into

the territory of another representative, the commission was to be split. The Grace Fabri-Tool Company management recognised that from 12 to 18 months would be required before a representative could be expected to develop his territory.

1. Total cost of a Grace press.
2. Adoption of a new distribution channel.
3. Service expenses of \$400 to \$500 per press.
4. Lack of selling effort.
5. Desire for expanded distribution.
6. Complaints from buyers.
7. Possibility that manufacturers representatives would expand coverage.
8. *Difficulty in finding distributors.*
9. Delays in completing service calls.
10. Lack of distributors facilities.

PASSAGE II

Source Perrier was one of the largest distributors of natural water in France. By the early 1970s it was having difficulty in sustaining growth of its sales in France and looked to develop a market in the United States. Its American operation was headed by Brace Nevins.

There were a number of conditions that made Nevins optimistic about the acceptance of Perrier water by American consumers. The most important of these was the growing diet-consciousness. Miller brewing had hit the market with phenomenal success a few years earlier with the introduction of Lite beer. Since cyclamates had been banned in soft drink, producers had turned to saccharin which many people found distasteful. There was also no popular low-caloric drink that was considered chic to order. The use of the adjective "diet" simply announced that the drinker was encountering weight problems. If people could be persuaded that Perrier tasted good, then it could be a preferred low-caloric alternatives.

Another trend was toward natural foods for health reasons. Even tap water and the 75 percent of bottled

water that was processed from tap water had become suspect. In the process of purification, cancer suspect chlorine derivatives were added to water. Furthermore, certain viruses, sodium, and heavy metals were still found in most purified water and soda water. Perrier came from natural springs, contained high calcium, no sodium, and no additives. It could be promoted as a natural drink with healthy properties even though some of the bubbles were lost when the water was removed from the springs and put back in during the bottling process.

A third factor was a growing U.S preference for imports. This was apparent not only by the rising ratio of imports to gross national expenditures, but also by the acceptance of "foreignness". In terms of foods, so-called gourmet restaurants, cookbooks, dinner clubs, ingredients, and wines were becoming commonplace, and French items were practically synonymous with the word gourmet. Perrier might successfully capitalise on these attitudes.

The marketing program for Great Water of France really got underway in 1977. One of the first questions was in which part of the market to position Perrier. The three trends discussed above would clearly lead to different price, promotion, and distributor strategies because of facing different competitors in each segment. In order to go after the diet market segment, for example, Perrier would come face-to-face with Coca and Pepsi-Cola, who between them controlled 45 percent of the soft-drink market. These firms, along with many others that competed for the remaining 55 percent of sales, fought vigorously in the market by keeping prices fairly low, advertising heavily, and clamoring for shelf space in the soft-drink section of supermarkets. The difficulty of competing in this segment is evident by the experience of Schweppes, which inspite of establishing U.S. bottling facilities and engaging in heavy marketing outlays had failed to get even 1 percent of the market. To compete in this mass market segment might also cause Perrier to lose the snob appeal it held among high-income buyers.

To compete in the natural or health foods segment would pit Perrier against other bottled water

producers and various tonics that contained healthful additives. This was a very small market as compared with soft drinks. The 1976 sales of bottled water were \$189 million of which 93 percent was from purified domestic still water. This was largely sold in five-gallon containers at low prices through home or commercial delivery. Less than 20 percent of bottled water was sold in retail stores, and there was little brand identification. To expand retail sales would probably mean concentrating on gaining shelf space in the health food sections of stores. Since bottled water sales were determined to be much more geographically concentrated than soft drink sales, it would be far easier for Perrier to target its promotion and distribution for this segment. About 50 percent of sales, for example, were in California.

The gourmet market was the one to which Source Perrier had been selling for some 70 years. There was undoubtedly usage as well as distributional gaps in this market. The total sales of mineral water in 1976 were only \$15 million. Primary demand might be increased and Perrier might be made more readily available through increased distribution to speciality stores and new distribution to the growing gourmet sections of supermarkets.

Perrier decided to hit the mass market by competing in the soft-drink market segment. One of the first problems that they had to overcome was the price of the product. Through massive distribution, they reasoned that the retail price could be cut about 30 percent. Even at that the price was still about 50 percent higher than the average soft drink. The price was considered "rock bottom". The cost of transporting water across the Atlantic was expensive, resulting in an East Coast retail price in 1977 of 69 cents for a 23-ounce bottle. This included a retail gross margin of 27.6 percent as compared to 22.6 percent on soft drinks. Management reasoned that the higher margin would make supermarkets more willing to handle Perrier. A low margin was maintained by Perrier not only to become more price competitive with domestic soft drinks, but also to dissuade other European firms from exporting to the United States. To get people to pay what was still a high price, it was necessary to segment the soft-drink market differently

than anyone had heretofore done - by aiming at an adult population and using the higher price to gain snob appeal.

Great Waters of France felt that distribution was the real key to success. A sales force of forty people, almost all of whom were formerly with soft-drink firms, were hired. Through a close examination of demographics, three cities were picked for the first expansion efforts. The cities (New York, San Francisco, and Los Angeles) were those with the largest penchant for imported food items. The company made a film designed to convey to distributors and supermarket chains that Perrier water had a long term viability. The film showed that the springs and been popular as far back as 218 B.C. when Hannibal partook of the waters and that the present firm dates back to 1903. Supplies 400 million bottles a year, and outsells the leading cola in Europe by 2 to 1. Perrier sought the most aggressive distributors for these first and subsequent market areas. These included soft-drink sections, replenish stocks frequently, and set up point of purchase displays. One of the first distributors, Joyce Beverage Management, bought fifty-five trucks and hired 100 additional people to handle the Perrier account. In the introductory period, arrangements were made for secondary display stacks and in-store tastings. The company also gave cents-off coupons with purchases. Within a year, Perrier had moved from three to twenty major market areas. This was doubled in the second year.

For the big sales push, Perrier developed 11-ounce and 6.5-ounce bottles, the latter sold in multipacks. They also developed a modern logo on the bottles, latter to be replaced by the original label design, which was more congruent with the old-world image that the firm wished to project. With the old-world image that the firm wished to project. With initial distribution assured, it was necessary to get sufficient appeal so that the bottles on the shelves would be sold. In Europe the company could make therapeutic claims; however, the U.S. law was very strictly against this. In test marketing, Perrier tried such themes as "formerly heavy drinkers such as Richard Burton and Ed Mc Mahon are now "hooked" on Perrier" and contains no sodium which causes heartburn." These

were abandoned in favour of messages emphasising its qualities as a natural thirst-quencher with no calories and no additives. Initial promotion was regional, relying heavily on the print media. Groups of food and beverage writer were invited for dinners and exhibitions so that they would write about Perrier. Marathons were sponsored so that the product would be associated both with "healthiness" and "thirst-quenching". As distribution became national, Perrier got Orson Welles to give TV spots on network channels. The advertising budget was set high, \$1 million, \$2 million, and \$7 million for respective fiscal years 1977, 1978 and 1979. Throughout this period, Perrier was able to maintain a snob appeal by getting tidbits in gossip columns about celebrities being seen sipping Perrier in the "right places".

Sales increased rapidly to 21 million bottles in 1977, 60 million in 1978, over 100 million in 1979, and over 200 million in 1980. The increase did not go unnoticed by either the media or by competitors. By 1979, a bottling executive said, "Everyone with water seeping from a rock is buying glass, slapping a label on, it and marketing a new bottled water." In the first quarter of 1979 alone, seven new bottled water came on the market. Some of the old bottled spring water firms suddenly sought a larger share of the growing market. They promoted blind tasting comparisons to emphasize that American water was just as tasty as the imports. Nestle's Deer Park brand made a challenge

with a spring water priced 35-40 percent below Perrier. A Chicago firm, Hinckley and Schmitt, introduced Perrier. Its theme was, "let your guests think it's imported". Norton Simon's Canada Dry began repositioning its club soda to be more competitive with Perrier. SAMI, a market research group, reported 104 brands of bottled waters in its territory.

In view of the increased competition from American companies, Nevins was forced to review his company's marketing strategy.

11. Perrier as a low-calorie alternative to soft drinks.
12. No sodium in Perrier water.
13. Diet-consciousness of Americans.
14. Cutting the retail price by 30 percent.
15. Perrier's success in France.
16. Advantages of mineral water.
17. Lagging growth of Perrier in France.
18. Finding a market position for Perrier.
19. Increased competition from American bottlers.
20. U.S. advertising legislation.

Directions : Each passage in this section is followed by questions based on its contents. Read the passage carefully and then answer the questions given below them by choosing the best answer to each question.

SECTION - II : READING COMPREHENSION

Answer the question on the basis of what is stated or implied in the passages.

PASSAGE - I

The systems perspective applied to organisations in its classic formulations as an organic or a cybernetic model is open to criticism for failing to give a sufficient account of change. In the organic model, change is seen primarily as an adaptive response by the system, acting as a whole or through systems with specific functions, to maintain itself in balance with a shifting environment. Change is thus externalised beyond the system boundary. The

organism's response is characterised as a negative feedback process by means of which a control centre becomes aware of a disparity between actual and desired behaviour or conditions and triggers actions to reduce the disparity. The model assumes that the organism is so constituted as to be able to detect significant disparities and to be able to adjust its behaviour in response to them.

When the organic model is generalised to apply to organisations, the emphasis on boundary, environment, feedback and adaptive response is carried over, and management is reality identified as the control centre, which directs the organisation's

the same unity of consistency of form as organisms. Their external boundaries as well as internal boundaries between subsystems, are less problem situations are not generally preset or in built, but have to be invented. Applied uncritically, the model attributes too central a role to management and overestimates management's power to control events and actions. Direction of operations comes not from an integrated control centre but from a multiplicity of factors whose behaviour is not merely adaptive but also creative and contentious.

The cybernetic model provides a more elaborate account of control and communication mechanisms organised hierarchically and recursively and distributed throughout the system. It also includes an environmental scanning function, which opens up the possibility of proactive change in the system. Nevertheless, although change becomes a subtler, complex and generalised phenomenon in this model, changes are still seen as adjustments, whether reactive or proactive which serve to maintain or increase order in the system. Nor is it any easier to relate change to human agency in the cybernetic model than in the organic.

In the "soft systems" approach articulated by Checkland, attention shifts from the actual constitution of organisations as complex systems towards organisational actors' understandings and formulations of problem situations. This is a view, which allows and expects multiple interpretations of the world at hand. When soft systems methodology (SSM) is applied to a problem situation in an organisation, it culminates in a debate, which aims to define changes, which are "systematically desirable and culturally feasible". The human role in defining (and subsequently carrying out) changes is thus recognised.

The soft systems approach make changes more central to organisational life than it is in the harder approaches sketched above, which focus on the system's capacity to cope with and respond to environmental perturbations. Change now becomes something, which flows from human understanding and decision-making, which is not in general prefigured or automatic, and which involves

negotiation by competing parties. However, some of the legacy of the earlier systems views persists in the soft system approach and methodology and serves to prevent fuller appreciation of the nature of change in organisational life. For instance, the central notion of transformation in the methodology relates still to the transformation of inputs into outputs by the system, rather than to transformation of the system itself. Analysis and modelling in SSM, by and large, is conducted by the analyst alone, so that some of the most important interpretations in the change exercise are supplied by external experts. When the conceptual model is brought forward by the analyst for organisational debate, the voice of management is likely to be dominant, again restricting opportunity for a more thorough going review of possibilities. Thus, even though the soft systems approach brings change to the centre of the organisational stage by focussing on human activity system and embracing the interpretive standpoint, change is still characterised as a discontinuous step from an old order to new one, facilitated by the alchemy of the analyst, and sanctioned by management.

In the systems tradition as discussed so far, there is a common interest in how complex systems, achieve, maintain and increase order, in a turbulent environment, which threatens to invade or dissolve them. In the organic model, change is essentially an external threat to be responded to. Richer notions of change are developed in cybernetic and soft systems approaches, but still, change is seen as a way of preserving or improving order in the system, rather than as a fundamental feature of the system itself. In the translation of system concepts to organisational models, the identification of control with management has produced an impression that, managers, in alliance with experts, can and should manage change.

It has always been clear that organisation are not organisms, but the limitations of applying the organic metaphor have only become obvious relatively recently, when the pace of organisational and technological change has thrown into question the contemporary validity of organisational models based on central control, stability and bureaucracy. It may be that continuous change is an essential feature

for organisations or it may be that disorder is not only tolerable in organisation but also natural and productive. To contemplate these possibilities. It is necessary to go beyond the familiar systems models and at the same time to question ideas of changed management.

Kiel, following an earlier formulation by Jantsch describes three stages in the development of model of organisation change. The first stage, deterministic change, is a mechanical or linear view, which equates to a pre-systems or early systems view of organisations as machines subject to rational control. The second stage, equilibrium-based change, is essentially the systems perspective, especially as represented by the organic or cybernetic, models, views organisations as dynamic self-organising systems capable of radical transformation as well as gradual evolution and continually moving between order and disorder and between stability and instability. Organisational model is this third stage beyond (or may be seen to extend) the systems traditions, drawing on theories of chaos, complexity and self-organisation from the natural sciences. New holistic theories of change are emerging which challenge the centrality of order and control in complex systems.

According to these theories, many complex systems are non-linear, i.e., systems in which relationship between cause and effect are not constant. Therefore, small inputs can sometimes lead to disproportionately large consequences (and at other times not), and small variations in initial conditions can sometimes produce large variations in outcomes (and sometimes not). Generally, processes cannot be fully controlled or planned, and cannot be run back and repeated. Many natural systems, including ecologies and the weather, are non-linear. They are characterised by Complex multiple patterns of interaction which combine with random disturbances to produce unpredictable event that will sometimes transform the system into an entirely new configuration. In general, as they move from one relatively stable region of behaviour to another, such systems pass through a chaotic transition phase, A

system far from equilibrium and at the edge of chaos is one on the point of transformative change, but the future state of the system is not predictable.

It seems attractive to adopt a transformational model of organisational change derived from these more general ideas of dynamic non-linear systems. The complexity, uncertainty and centrality of change processes seem much better captured in this kind of model than in earlier systems models. However, it should be remembered that just as organisations are not organisms neither are they weather systems or whirlpools. Organisations are constituted by people, not particles. Change is produced not by the complex interaction of effectively structureless atoms, but by the meaningful and value-laden interaction of already complex individual human beings.

Though it may indeed be fruitful to see organisations as non-linear systems, to do so will require a fundamental shift in our understanding of the role and limits of management. It would for instance be fallacious to assume that management can apply the transformational model in order to produce a desirable transformation in their organisations, since this would be to treat non-linear systems as though they were linear (and so predictable and controllable). Another danger is that by simply adopting the language of non-linear systems we will produce a spurious jargon and mystification which will lead neither to increased understanding nor to practical action in organisational life. The theories of chaos and complexity are seductive and can easily lead you into a world of butterfly effects, strange attractors and NK fitness landscapes, nevertheless, a cautious and sober application of them might prove fruitful in our area of interest.

21. Choose the correct statement from the following
- Cybernetic model focusses on actors understanding and formulations of problem situations
 - Organic model focusses an actors understanding and formulations of problem situations

- (c) Soft systems approach focusses on actors understanding and formulations of problem situations
- (d) Soft systems approach focusses on organisations as complex systems
- (e) None of the above
22. Which one of the following assumptions may be made from the passage?
- (a) Processes can be fully planned
- (b) Many natural systems are characterised by complex patterns of interaction
- (c) People are particles of organisations
- (d) Change is produced by complex interactions of atoms
- (e) None of the above
23. The systems model has been criticised because it
- (a) failed to provide a satisfactory account of change
- (b) revealed the classic dimension of the organic model
- (c) did not respond to negative feedback
- (d) None of the above
24. Which one of the following is a correct statement?
- (a) Deterministic change is the systems perspective
- (b) Equilibrium-based change is the systems approach
- (c) Equilibrium-based change is a mechanical view
- (d) Transformational change is a mechanical view
- (e) None of the above
25. Which one of the following is not a correct statement?
- (a) Change is primarily a response to the environment
- (b) The system as a whole or the sub-systems adapt to the environment
- (c) The environment is not stable
- (d) Change cannot be externalised beyond the system boundary
- (e) None of the above
26. According to the passage, change
- (a) does not flow from human understanding or decision making
- (b) is generally prefigured
- (c) is automatic
- (d) involves negotiation by competing parties
- (e) none of the above
27. The organic model assumes that
- (a) the organism's response is negative
- (b) a control centre influences behaviour
- (c) the organism is able to adjust its behaviour
- (d) the organism is not able to detect significant disparities
- (e) none of the above
28. Which one of the following is not a correct statement?
- (a) Management is seen as the control centre of organisations
- (b) Organic model uses concepts of boundary and adaptive response
- (c) The organic model views management as a part of environment
- (d) Organisations are not totally comparable to organisms
- (e) None of the above
29. Which one of the following is not a correct statement?
- (a) Cybernetic model recognises human role in defining change
- (b) Organic model does not recognise human role in defining change
- (c) Soft systems approach recognises human role in defining change
- (d) Soft systems approach defines changes, which are symmetrically feasible
- (e) None of the above
30. Which one of the following is a correct statement?
- (a) Cybernetic model takes better care of environmental factors.
- (b) Organic model takes better care of environmental factors

- (c) Cybernetic model is not suitable for proactive change
- (d) Organic model is suitable for proactive change
- (e) None of the above

PASSAGE - II

From ancient times, men have believed that, under certain peculiar circumstances, life could arise spontaneously: from the ooze of rivers could come eels and from the entrails of dead bulls, bees; worms from mud, and maggots from dead meat. This belief was held by Aristotle, Nowton and Desecrates, among many others, and apparently the great William Harvey too. The weight of centuries gradually disintegrated men's beliefs in the spontaneous origin of maggots and mice, but the doctrine of spontaneous generation clung tenaciously to the question of bacterial origin. In association with Buffon, the Irish Jesuit priest John Needham declared that he could bring about at will the creation of living microbes in heat-sterilised broths, and presumably in propitiation theorised that God did not create living things directly but made the earth and water to bring them forth. In his *Dictionnaire Philosophique*, Voltaire reflected that it was odd to read of Father Needham's claim while atheists conversely should deny a Creator yet attribute to themselves the power of creating eels. But, wrote Thomas Huxley, "The great tragedy of science --- slaying of a beautiful hypothesis by an ugly fact --- which is so constantly being enacted under the eyes of philosophers, was played almost immediately for the benefit of Buffon and Needham.

The Italian Abbe Spallanzani did an experiment. He showed that a broth sealed from the air while boiling never develops bacterial growths and hence never decomposes. To Needham's objection that Spallanzani had reined his broths and the air above them by excessive boiling the abbe replied by breaking the seals of his flasks. Air rushed in and bacterial growth began! But the essential conflict remained. Whatever Spallanzani and his followers did not remove seeds and contaminants was regarded by the spontaneous generationists as damaging to the 'Vital force' from whence comes new life.

Thus doubt remained and into the controversy came the titanic figure of Louis Pasteur. Believing that solution to the problem was essential to the development of his theories concerning the role of bacteria in nature, Pasteur freely acknowledged the possibility that living bacteria very well might be arising in a new form from inanimate matter. To him the research problem was largely a technical one; to repeat the work of those who claimed to have observed bacterial entry. For the one that contended that life did not enter from the outside, the proof had to go to the question of possible contamination. Pasteur worked logically. He found during the experiments that after prolonged boiling a broth would ferment either air contained a factor necessary for the spontaneous generation of life or viable germs were borne in by the air and seeded in the sterile nutrient broth. Pasteur designed ingenious flasks whose long S-shaped necks could be left open. Air was trapped in the sinuous glass tube. Broths boiled in these flask tubes remained sterile. When their necks were snapped to admit ordinary air, bacterial growth would then commence... but not in every case. An occasional flask would remain sterile presumably because the bacterial population of the air is unevenly distributed. The forces of spontaneous generation would not be so erratic. Continuous skepticism drove Pasteur almost to fanatical efforts to control the ingredients of his experiments to destroy the doubts of the most skeptical. He ranged from the mountain air of Montanvert which he showed to be almost sterile, to those deep clear wells whose sandy soil. The latter discovery led to the familiar porcelain filters of the bacteriology laboratory. With pores small enough to exclude bacteria, solutions allowed to percolate through them could be reliably sterilised.

The argument raged on and soon spilled beyond the boundaries of science to become a burning religious and philosophical question of the day. For many, Pasteur's conclusions caused conflict because they seemed simultaneously to support the Biblical account of creation while denying a variety of other philosophical systems. The public was soon caught up in the cross fire of a vigorous series of public lectures and demonstrations by leading exponents of

both views, novelists clergymen, their adjuncts and friends. 'Perhaps the most famous of these evening the theatre - competing perhaps with a great debate between Huxley and Bishop Wiberforce for elegance of rhetoric -- was Pasteur's public lecture at the Sorbonnel on April 7, 1864. Having shown his audience the swan necked flasks containing sterile broths, he concluded, "And, therefore, gentleman, I could point to that liquid and say to you, I have taken my drop of water from the immensity of creation, and I have taken it full of the elements appropriated to the development of inferior beings, And I wait, I watch, I question it! -- begging it to recommence for me the beautiful spectacle of the first creation. But it is dumb, since these experiments were begun several years ago; it is dumb because I have kept it from the only thing man does not know how to produce; from the germs that float in the air, from life, for life is a germ and a germ is life.

Never will the doctrine of spontaneous generation recover form the mortal blow of that experiment. And it is not. Today these same flasks stand immutable: they are still free of microbial life.

It is an interesting fact that despite the ringing declaration of Pasteur, the issue did not completely. And although far from healthy, it is not yet dead. In his fascinating biography of Pasteur, Rene Dubos has traced the later developments which saw new eruptions of the controversy, new technical progress a criticism, and new energetic figures in the breach of the battle such as Bastion, for the immortal. Tyndall against the doctrine of spontaneous generation. There was also new 'sorrow' for Pasteur as he read years later, in 1877, the last jottings of the great physiologist Claude Bernard and saw in them the 'mystical' suggestion that yeast may arise from grape juice. Even at this late date, Pasteur was stirred to new experiments again to prove to the dead Bernard and his followers the currentness of his position.

It seems to me that spontaneous generation is not only a possibility but a completely reasonable possibility which should never be relinquished from scientific throughout. Before men knew of bacteria they accepted the doctrine of spontaneous generation as the only reasonable attributive' to a belief is

supernatural creation. But today, as we look for satisfaction at the downfall of the spontaneous generation hypothesis, we must not forget that science has rationally concluded that life once did originate on each by spontaneous generation that for the first time brought the whole difficult question that for the first time brought the whole difficult question of the origin of life before the scientific world. In the above controversy, what was unreasonable was the parade of men who claimed to have 'proved' or who resolutely 'believed in' spontaneous generation on the face of proof -- not that spontaneous generation cannot occur --- but that their work was shot rough with experimental error. The acceptable evidence to makes it clear that spontaneous generation, if it does not occur, must obviously be a highly improbably event under present conditions. Logic tells us that science can fly prove an event improbable; it can never prove it possible - and Gamow has appropriately remarked that body is really certain what would happen if a hermetically called can were opened after a couple of million years. Modern science agrees that it was highly improbable for to have arisen in the pre-Cambrian seas, but it, included nevertheless, that there it did occur. With this, work Pasteur would agree.

Aside from their theoretical implications, these researchers had the great practical result of putting bacteriology on a solid footing. It was now clear how precisely careful one had to be to avoid bacterial contamination in the laboratory. We now knew what 'steile' meant and we knew that there could be no such thing as 'partial sterilisation'. The discovery of bacteria high in the supper atmosphere, in the mud of the deep sea bottom, in the waters of hot springs, and in the Arctic glaciers established bacterial ubiquity as almost absolute. In recognition of this Lord Lister introduced aseptic technique into the practice of surgery. It was the revolution in technique along that made possible modern bacteriology and the subsequent research connecting bacteria to phenomena of human concern, research, which today is more prodigious than ever. We are just beginning to understand the relationship of bacteria to certain human diseases, to soil chemistry, nutrition, and the

phenomenon of antibiosis wherein a product of one organism (e.g. penicillin) is detrimental to another.

It is into an exaggeration then to say that the emergence of the cell theory represents biology's most significant and fruitful advance. The realisation that all plants and animals are composed of cells which are essentially alike, that cells are all formed by the same fundamental division process, that the total organism is a whole made up of the activities and interrelations of its individual cells, opened up horizons we have not even begun to approach. The cell is a microcosm of life, for in its origin, nature and continuity resides the entire problem of biology.

31. Needham's theory that 'God did into create living things directly' was posited as
- (a) an attempt to support his assertion by religious doctrine
 - (b) an attempt to placate his religious peers
 - (c) an attempt to propitiating a possibly offended God or the religious psyche of the time
 - (d) all of the above
 - (e) none of the above
32. It can be inferred from the passage that
- (a) Huxley, Buffon and Needham were contemporaries
 - (b) Buffon, Needham, Voltaire and Huxley were contemporaries
 - (c) Voltaire wrote a treatise on Needham's claim
 - (d) None of the above
 - (e) All of the above
33. According to the passage
- (a) Pasteur's precursors in the field worked on the basis of spontaneous generation
 - (b) Unlike his predecessors Pasteur worked on logical premises rather than arbitrary and spontaneous
 - (c) Pasteur stood to benefit largely from the work of his predecessors
 - (d) Pasteur developed the ideas set forth by Voltaire and Needham
 - (e) None of the above

34. Pasteur began his work on the basis of the contention that
- (a) either air contained a factor necessary for the spontaneous generation of life or viable germs were borne in by the air and seeded in the sterile nutrient broth
 - (b) after prolonged boiling, a broth would ferment only when air was admitted to it
 - (c) God did not create living things directly but bade the earth and water of bring them forth
 - (d) Both 1 and 2
 - (e) Neither 1 nor 2
35. The porcelain filters of the bacteriology laboratories owed their descent to
- (a) Pasteur's homeland
 - (b) The well water of Mantanvert that had been rendered germ free by slow filtration through sandy soil
 - (c) Ingenious flasks with S shaped necks used by Pasteur
 - (d) Both 1 and 2
 - (e) None of the above
36. What, according to the passage was Pasteur's declaration to the world?
- (a) Nobody could deny the work done by him.
 - (b) Science would forever be indebted to his experiments in bacteriology
 - (c) The doctrine of spontaneous generation would never recover from the mortal blow dealt to it by his experiment
 - (d) Those who refused to acknowledge his experiments
 - (e) None of the above
37. What according to the writer was the problem with a proponents of spontaneous generation?
- (a) Their work had no scientific basis
 - (b) Their work was ruined by experimental errors
 - (c) Their work was based on religious beliefs
 - (d) Both 1 and 2
 - (e) None of the above
38. One of the results of the theoretical cross fire regarding bacteriology was that

- (a) partial sterilisation as a possibility was ruled out
 (b) aseptic technique was introduced in surgery
 (c) the meaning of sterile was clear to all
 (d) all of the above
 (e) none of the above
39. One of the reasons for the conflict caused by Pasteur's experiments was that
 (a) they denied the existence of God as the creator
 (b) they seemed simultaneously to support the Biblical account of creation while denying a variety of other philosophical systems
 (c) academicians and scientists refused to accept his theories
 (d) there were too many debates on the topic and this left the people confused
 (e) none of the above
40. According to the author
- (a) It is an exaggeration to say that cell theory represents biology's most significant and fruitful advance
 (b) Pasteur could not hold his own against the contenders
 (c) Cell theory rendered null and void all the other bacteriological theories of the time
 (d) The emergence of the cell theory represents biology's most significant and fruitful advance
 (e) None of the above
41. For how many positive integer, a is it true that $a^2 \leq 2a$?
 (a) 0 (b) 1
 (c) 2 (d) 4
 (e) More than 4
42. If the product of 4 consecutive integers is equal to one of them, the largest possible value of one of the integers is
 (a) 0 (b) 3
 (c) 4 (d) 6
 (e) 24

SECTION III : PROBLEM SOLVING

43. If $-7 \leq x \leq 7$ and $0 \leq y \leq 12$, the greatest possible value of $y - x$ is
 (a) -19 (b) 5
 (c) 7 (d) 17
 (e) 19
44. If $0 < x < 1$, which one of the following lists the numbers in increasing order?
 (a) \sqrt{x}, x, x^2 (b) x^2, x, \sqrt{x}
 (c) x^2, \sqrt{x}, x (d) x, x^2, \sqrt{x}
 (e) x, \sqrt{x}, x^2
45. At Murugan's Stores everything is sold for 20% less than the price marked. If Murugan buys dolls for Rs. 80, what price should he mark them if he wants to make a 20% profit on his cost?
 (a) Rs. 96 (b) Rs. 100
 (c) Rs. 112 (d) Rs. 120
 (e) Rs. 125
46. In the diagram below, $b : a = 7 : 2$. What is $b - a$?
- (a) 20 (b) 70
 (c) 100 (d) 110
 (e) 160
47. Mary's average (arithmetic mean) on 4 tests is 80. Assuming she can earn no more than 100 on any test, what is the least she can earn on her fifth test and still have a chance for an 85 average after seven tests?
 (a) 60 (b) 70
 (c) 75 (d) 80
 (e) 85
48. If $a + b = 3(c + d)$, which one of the following is the average (arithmetic mean) of a, b, c and d ?
 (a) $\frac{c + d}{4}$ (b) $\frac{3(c + d)}{8}$
 (c) $\frac{c + d}{2}$ (d) $\frac{3(c + d)}{4}$
 (e) $c + d$

49. In the diagram below, lines l and m are not parallel.



If A represents the average (arithmetic mean) of the degree measures of all eight angles, which one of the following is true?

- (a) $A = 45$ (b) $45 < A < 90$
 (c) $A = 90$ (d) $90 < A < 180$
 (e) $A = 180$
50. In the afternoon, Beth read 100 pages at the rate of 60 pages per hour; in the evening, when she was tired, she read another 100 pages at the rate of 40 pages per hour. What was her average rate of reading for the day?
- (a) 45 (b) 48
 (c) 50 (d) 52
 (e) 55
51. A jar contains only red, white, and blue marbles. The number of red marbles is $\frac{4}{5}$ the number of white ones, and the number of white ones is $\frac{3}{4}$ the number of blue ones. If there are 470 marbles in all, how many of them are blue?
- (a) 120 (b) 134
 (c) 150 (d) 184
 (e) 200
52. The volume of two cylinders are as $a : b$, and their heights are as $c : d$. The ratio of their diameter is
- (a) $\frac{ad}{bc}$ (b) $\frac{ad^2}{bc^2}$
 (c) $\sqrt{\frac{ad}{bc}}$ (d) $\frac{c}{d} \sqrt{\frac{a}{b}}$
 (e) $\frac{ab}{cd}$
53. Three distinct numbers x, y, z from a geometric progression in that order, and $x + y, y + z, z + x$ from an arithmetic progression in that order. The common ratio of the geometric progression is
- (a) -2 (b) 2

- (c) 0.5 (d) -0.5
 (e) 3

54. The medians AD, BE and CF of a triangle ABC intersect at G . Which one of the following is true for any $\triangle ABC$?
- (a) $GB + GC = 2GA$
 (b) $GB + GC < 2GA$
 (c) $GB + GC > 2GA$
 (d) $GB + GC = GA$
 (e) None of the above
55. When a certain positive integer P is divided by another positive integer, the remainder is r_1 . When a second positive integer Q is divided by the same integer, the remainder is r_2 , and when $(P+Q)$ is divided by the same divisor, the remainder is r_3 . Then the divisor may be
- (a) $r_1 + r_2 + r_3$
 (b) $r_1 - r_2 + r_3$
 (c) $r_1 + r_2 - r_3$
 (d) $r_1 - r_2 - r_3$
 (e) Cannot be determined
56. Simplify: $\frac{\cos 60^\circ + \sin 60^\circ}{\cos 60^\circ - \sin 60^\circ}$
- (a) $\sqrt{3} - 2$ (b) $\sqrt{3} + 2$
 (c) $-(\sqrt{3} + 2)$ (d) 1
 (e) -1
57. One of the roots of the equation $x^2 - x + 3m = 0$ is double of one of the roots of the equation $x^2 - x + m = 0$. If $m \neq 0$, then the value of m is
- (a) 1
 (b) -1
 (c) 2
 (d) -2
 (e) None of the above
58. One of the angles of a parallelogram is 150° and altitudes are drawn from the vertex of this angle. If these altitudes measure 6 cm and 8 cm, the perimeter of the parallelogram is
- (a) 28 cm (b) 42 cm

- (c) 56 cm
(e) 14 cm

(d) 64 cm

- (d) 1000 km/hr
(e) None of the above

59. An aircraft was to take off from a certain airport at 8 a.m. but it was delayed by 30 minutes. To make up for the lost time, it was to increase its speed by 250 km per hour from the normal speed to reach its destination 1500 km away, on time. The normal speed of the aircraft is
- (a) 650 km/hr
(b) 750 km/hr
(c) 850 km/hr
60. Construction of a road was entrusted to a civil engineer. He was to finish the work in 124 days for which he employed 120 workmen. Two thirds of the work was completed in 64 days. The number of workmen that can be reduced now without affecting the completion of the work on time is
- (a) 56
(b) 64
(c) 80
(d) 24
(e) 45

SECTION - IV : DATA SUFFICIENCY

Directions : Each of the following problems has a question and two statements which are labeled (1) and (2) in which certain data are given. You have to decide whether the data given in the statements are sufficient for answering the question. Using the data given in the problem plus you knowledge on mathematics and every day facts, choose :

- (A) If you can get the answer from (1) ALONE but not from (2) alone.
(B) If you can get the answer from (2) ALONE but not from (1) alone.
(C) If you can get the answer from BOTH (1) and (2) TOGETHER, but not from (1) alone or (2) alone.
(D) If EITHER statement (1) ALONE or statement (2) ALONE suffices
(E) If you CANNOT get the answer from statement (1) and (2) TOGETHER, but need even more data
61. Plane X flies at miles per hour from A to B. Plane F flies at S miles per hour from B to A. Both planes take off the same time. Which plane flies at a faster rate? Town C is between A and B.
- (a) C is closer to A than it is to B
(b) Plane X flies over C before plane Y
62. A jar is filled with 60 marbles. All the marbles in the jar are either red or green. What is the

smallest number of marbles that must be drawn from the jar in order to be certain that a red marble is drawn?

- (a) The ration of red marbles to green marbles is 2 : 1
(b) There are 20 green marbles in the jar
63. The hexagon ABCDEF is inscribed in the circle with centre O. What is the length of AB?



- (a) The radius of the circle is 4 inches
(b) The hexagon is a regular hexagon. That means all its sides have the same length and all its interior angles are same
64. Is angle BAC a right angle?



- (a) $x = 2y$
(b) $y = 1.5z$
65. If a, b and c are digits, is $a + b + c$, a multiple of 9? A digit is one of the integers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

(a) The three-digit number abc is a multiple of 9

(b) $(a \times b) + c$ is a multiple of 9

66. Is the figure ABCD a rectangle?



(a) $x = 90$

(b) $AB = CD$

67. If both conveyer belt A and conveyer belt B are used, they can fill a hopper with coal in 1 hour. How long will it take for conveyer belt A to fill the hopper without conveyer belt B?

(a) Conveyer belt A moves twice as much coal as conveyer belt B.

(b) Conveyer belt B would take 3 hours to fill the hopper without conveyer belt A.

68. How much does Jaga weigh? Thiru weigh 200 kgs.

(a) Thiru's weight plus Maya's weight is equal to Jaga's weight.

(b) Jaga's weight plus Maya's weight is equal to twice Thiru's weight.

69. If $x^6 - y^6 = 0$, what is the value of $x^3 - y^3$?

(a) x is positive

(b) y is greater than 1

70. How many of the numbers x , y , and z are positive? x , y and z are all less than 30.

(a) $x + y + z = 61$ (b) $x + y = 35$

71. In 2005, the ratio of Indian cars sold to imported cars sold was 4 to 1. How many imported cars were sold in 2005?

(a) 60,00,000 Indian cars were sold in 2005.

(b) A total of 75,00,000 cars were sold in 2005.

72. Do the rectangle ABCD and the square EFGH have the same area?



(a) $AC = EG$, $AB = \frac{1}{2}EH$

(b) The area of triangle ABC is not equal to the area of the triangle EFG.

73. How many of the numbers x and y are positive? Both x and y are less than 20.

(a) x is less than 5

(b) $x + y = 24$

74. Is $xy < 0$?

(a) $x > 2$

(b) $y > -1$

75. Which is larger, a^b or b^a ? $a > 0$ and $b > 0$?

(a) $a = 1$

(b) $b > 2$

76. Two types of widgets, namely types A and B are produced on a machine. The number of machine hours available per week is 80. How many widgets of type A must be produced?

(a) One unit of type A widget requires 2 machine hours and one unit of type B widget requires 4 machine hours

(b) The widget dealer wants to supply at least 10 units of type A widget per week and he would not accept less than 15 units of type B widget.

77. Is the average of the largest and the smallest of four given numbers greater than the average of the four numbers?

(a) The difference between the largest and the second largest numbers is greater than the difference between the second smallest and the smallest numbers.

(b) The difference between the largest and the second largest numbers is less than the difference between the second largest and the second smallest numbers.

78. Given that X and Y are non-negative. What is the value of X ?

- (a) $2X + 2Y \leq 40$
 (b) $X - 2Y \geq 20$
79. 10 boys went to a neighbouring orchard. Each boy stole a few mangoes. What is the total number of mangoes they stole?
 (a) The first boy 4 mangoes, the fourth boy stole 16 mangoes, the eighth boy stole 32 mangoes and the tenth boy stole 40 mangoes.

(b) The first boy stole the minimum number of mangoes and the tenth boy stole the maximum number of mangoes.

80. Is segment PQ greater than segment RS?
 (a) $PB > RE$, $BQ = ES$
 (b) B is a point on PQ. E is a point on RS

SECTION - V : ENGLISH USAGE

Directions : In each of the following sentences four words or phrases have been underlined. Only one underlined part in each sentence is not acceptable in standard English. Pick up that part - (1) or (2) or (3) or (4). If there is no mistake mark (5).

81. He gave me a ticket so that I may visit the book fair. No error
 1 2 3 4 5
82. Since I have forgotten all the equations I will have to start from the scratch. No error
 1 2 3 4 5
83. Five litres of petrol are not enough to cover the distance. No error
 1 2 3 4 5
84. Since the under trial gave a slip to the escorting policemen, his whereabouts are not known. No error
 1 2 3 4 5
85. Neither the officer nor his subordinates brothers about the situation. No error
 1 2 3 4 5
86. When he was admitted in the hospital he was complaining against severe headache. No error
 1 2 3 4 5
87. Nothing and no one escape my attention. No error
 1 2 3 4 5
88. Kanchenjunga is one of the beautiful peak of the Himalayan range. No error
 1 2 3 4 5
89. He has become so weak that even a two furlong 's walk makes him breathless. No error
 1 2 3 4 5
90. She can sing better than me but she isn't as pretty as I. No error
 1 2 3 4 5
91. Although she had not read much, she had the capacity of choosing the right word in the right context. No error
 1 2 3 4 5
92. The difference between good and bad acting rest in the ability to project emotion to the audience. No error
 1 2 3 4 5
93. Projecting emotion to an audience requires control of the voice, restrained use of gesture, and a mysterious gift, called "stage presence".
 1 2 3

- which makes everything work. No error.
4 5
94. Notwithstanding my respect for the two men's
1 2
abilities, I have difficulty deciding which of their
3 4
productions of Romeo and Juliet was the worse.
No error.
5
95. Before he is good to make the team, he will learn
1 2
to train consistently, to pace himself in races,
3
and to eat and sleep properly. No error.
4 5
96. A depressed economy in the local area and a
tight money policy in Washington were the
1 2
reasons for the many bankruptcies of that
3 4
year. No error.
5
97. Never had the American navy sank so many
1 2
foreign warships as they did during that
3 4
initial battle. No error.
5
98. Each member of the Rangers wore their team
1
emblem, which appeared on all articles of
2 3 4
clothing. No error.
5
99. The truck rumbled by with a great noise,
1
which prevented me hearing the knock on the
2 3 4
door. No error.
5
100. It says in this morning's newspaper that much
1 2
wheat has been grown on the plains in the
3
Middle West in spite of severe windstorms. No
4 5
error.