

MBA 2011 – EXAMINATION PAPER**PART – I****Directions:**

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

1. if the item is a MAJOR OBJECTIVE in making the decision; that is, the outcome or result sought by the decision maker.
2. 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.
3. If the item is a MINOR FACTOR in making the decision; a less important element bearing on or affecting a Major Factor, rather than a Major Objective directly.
4. If the item is a MAJOR ASSUMPTION made deliberately; that is a supposition or projection made by the decision maker before considering the factors and alternatives.
5. 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 1

In 1976 officials of the Grace Fabri-Tool Company, manufacturers of special tools and presses for working with laminated 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 profits 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 meetings for distributors. Typically such a meeting would attract 50 to 500 people from the cabinet shops and woodworking and plastic-fabricating 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 no uncommon for a distributor to experience a 30 to 35 percent increase in Formica sales.

After two years as a Formica demonstrator, Grace felt 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 design 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 except forming could be performed with ordinary 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. Representatives of the tool were the routing and trimming fixtures. The average price of the tools was about \$15.

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

The Grace Thermofast vaccum 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 a 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 of the 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 prospective 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-filters.

However, some had taken on noncompeting items to serve their customers better. Many of the customers 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 customer's needs, but it was possible for their salesman 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' salesman 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 for additional ones decreased and in time the company ran out of ideas. This caused 'distributors' salesman to lose their special interest in the Grace tools.

Prior to late 1975, distribution 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 and in 1975 reached \$455,000. 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. The 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 claim 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 equipments 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 recognized that from 12 to 18 months would be required before a representative could be expected to develop his territory.

Questions :

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 2

Source Perrier was one of the largest distributors of natural water drinks 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 Bruce 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 drinks, 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 alternative.

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 common place, and French items were practically synonymous with the word gourmet. Perrier might successfully capitalize 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 distribution 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-Cola 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 Dchweppes, which inspite of establishing U.S. bottling facilities and engaging in heavy marketing outlay 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 distributed 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. This 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 firms showed that the springs had 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 bottlers, alcoholic beverage distributors and food brokers in different areas. It was essential that distributors be able to get supermarket space in the 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, later to be replaced by the original label design, which was more congruent 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 McMahon 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 writers 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 waters 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 emphasise 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 in a bottle with a label that unashamedly copied Perrier. Its theme was, "let your guests think it's imposed." 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.

Questions :

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.

PART – II**Directions :**

Each passage in this section is followed by questions based on its contents. Read the passages carefully and then answer the questions given below them by choosing the best answer to each question. Answer the questions on the basis of what is stated or implied in the passages.

PASSAGE – 1

The systems perspective applied to organizations 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 externalized beyond the system boundary. The organism's response is characterized 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 behavior in response to them.

When the organic model is generalised to apply to organizations, the emphasis on boundary, environment, feedback and adaptive response be carried over, and management is readily identified as the control centre, which directs the organisation's operations. However organizations do not possess the same unity or consistency of form as organisms. Their external boundaries as well as internal boundaries between subsystems, are less evident and less fixed. Responses to internal and external problem situations are not generally preset or inbuilt, 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 come not from an integrated control centre but from a multiplicity of factors whose behavior is not merely adaptive but also creative and contentious.

The cybernetic model provides a more elaborate account of control and communication mechanisms organized 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 generalized 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 organizations 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 makes changes more central to organizational 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, and which involves negotiation by competing parties. However, some of the legacy of the earlier systems views persists in soft system approach and methodology and serves to prevent fuller appreciation of the nature of change in organization 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 modeling 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 organizational 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 a 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 systems concepts to organizational models, the identification of control with management has produced an impression that organizational change must be managed, and that, managers, in alliance with experts, can and should manage change.

It has always been clear that organizations are not organisms, but the limitations of applying the organic metaphor have only become obvious relatively recently, when the pace of organizational and technological change has thrown into question the contemporary validity of organizational models based on central control, stability and bureaucracy. It may be that continuous change is an essential feature for organizations or it may be that disorder is not only tolerable in organizations 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 organizational change. The first stage, deterministic change, is mechanical or linear view, which equates to a pre-systems or early systems view of organizations 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. The third stage, dissipative or transformational change, views organizations 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 models in this third stage go 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 relationships 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 characterized by complex multiple patterns of interaction which combine with

random disturbances to produce unpredictable events that will sometimes transform the system into an entirely new configuration. In general, as they move from one relatively stable region of behavior 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 organizational 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 organizations 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 organizations as non-linear systems, to do so will require a fundamental shift in our understanding of the role and limits of control and likewise 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 organizations, 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 organizational 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.

Questions:

21. Choose the correct statement from the following :

- 1) Cybernetic model focuses on actors understanding and formulations of problem situations.
- 2) Organic model focuses on actors understanding and formulations of problem situations.
- 3) Soft systems approach focusses on actors understanding and formulations of problem situations
- 4) Soft systems approach focuses on organizations as complex systems.
- 5) None of the above

22. Which one of the following assumptions may be made from the passage?

- 1) Processes can be fully planned
- 2) Many natural systems are characterized by complex patterns of interaction
- 3) People are particles of organisations
- 4) Change is produced by complex interactions of atoms
- 5) None of the above

23. The systems model has been criticized because it

- 1) failed to provide a satisfactory account of change
- 2) revealed the classic dimension of the organic model
- 3) did not respond to negative feedback
- 4) refused to look beyond the system
- 5) None of the above

24. Which one of the following is a correct statement?

- 1) Deterministic change is the systems perspective
- 2) Equilibrium-based change is the systems approach
- 3) Equilibrium-base change is a mechanical view
- 4) Transformational change is a mechanical view
- 5) None of the above

25. Which one of the following is not a correct statement?

- 1) Change is primarily a response to the environment

- 2) The system as a whole or the sub-system adapt to the environment.
- 3) The environment is not stable
- 4) Change cannot be externalised beyond the system boundary
- 5) None of the above

26. According to the passage, change

- 1) does not flow from human understanding or decision-making
- 2) is generally prefigured
- 3) is automatic
- 4) involves negotiation by competing parties
- 5) none of the above

27. The organic model assumes that

- 1) the organism's responses is negative
- 2) a control centre influences behaviour
- 3) the organism is able to adjust its behaviour
- 4) the organism is not able to detect significant disparities
- 5) none of the above

28. Which one of the following is not a correct statement?

- 1) Management is seen as the control centre of organisations
- 2) Organic model uses concepts of boundary and adaptive response
- 3) The organic model views management as a part of environment.
- 4) Organisations are not totally comparable to organisms
- 5) None of the above

29. Which one of the following is not a correct statement?

- 1) Cybernetic model recognizes human role in defining change
- 2) Organic model does not recognise human role in defining change
- 3) Soft systems approach recognises human role in defining change
- 4) Soft systems approach defines changes, which are systematically feasible
- 5) None of the above

30. Which one of the following is a correct statement?

- 1) Cybernetic model takes better care of environmental factors.

- 2) Organic model takes better care of environmental factors
- 3) Cybernetic model is not suitable for proactive change
- 4) Organic model is suitable for proactive change
- 5) None of the above

PASSAGE – 2

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, Newton and Descartes, 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 bade 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 ruined 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 to 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 a 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 verywell might be arising in a new form from inanimate matter. To him the research problem was largely a technical one: to repet the work of thos 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 only when air was admitted to it. Therefore, he contended either air contained a factory 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 flas 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 rom the mountain air of Montanvert which he showed to be almost sterile, to those deep clear wells whose waters had been rendered germ free by slow filtration through 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, clergyman, 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 Sorbonne 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 mew the beautiful spectacle of the first creation. But it is dumb, 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 prodce: 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 from the mortal blow of this impel experiements." Arid 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 die completely. And although far from healthy, it is not yet dead. In his fascinating biography of Pasteru, 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 breah 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 latter, 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 correctness of his position.

It seems to me that spontaneous generation is not only a possibility but a completely reasonable possible which should never be relinquished from scientific thought. Before men knew of bacteria they accepted the doctrine of spontaneous generation as the 'only reasonable alternative' to a belief is supernatural creation. But today, as we took 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 earth by spontaneous generation. It was really Pasteur's evidence against spontaneous generation 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 through with experimental error. The acceptable evidence also makes it clear that spontaneous generation, if it does not occur, must obviously be a highly improbable event under present conditions. Logic tells us that science can only prove an event improbable: it can never prove it impossible – and Gamow has approximately remarked that nobody is really certain what would happen if a hermetically sealed can were opened after a couple of million years. Modern science agrees that it was highly improbable for life to have arisen in the pre-Cambrian seas, but it concluded, nevertheless, that there it did occur. With this, I think, 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 'sterile' meant and we knew that there could be no such thing as 'partial sterilisation'. The discovery of bacteria high in the upper 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 bacterial 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 not an exaggeration then to say that the emergence of the cell theory represents biology's most significant and fruitful advance. The realization 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 inter-relations 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.

Questions :

31. Needham's theory that "God did not create living things directly" was posited as

- 1) an attempt to support his assertion by religious doctrine
- 2) an attempt to placate his religious peers
- 3) an attempt to propitiate a possibly offended God or the religious psyche of the time
- 4) all of the above

32. It can be inferred from the passage that

- 1) Huxley, Buffon and Needham were contemporaries
- 2) Buffon, Needham, Voltaire and Huxley were contemporaries
- 3) Voltaire wrote a treatise on Needham's claim
- 4) None of the above
- 5) All of the above

33. According to the passage

- 1) Pasteur's precursors in the field worked on the basis of spontaneous generation
- 2) Unlike his predecessors Pasteur worked on logical premises rather than arbitrary and spontaneous discoveries
- 3) Pasteur stood to benefit largely from the work of his predecessors
- 4) Pasteur developed the ideas set forth by Voltaire and Needham
- 5) None of the above

34. Pasteur began his work on the basis of the contention that

- 1) 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

- 2) after prolonged boiling, a broth would ferment only when air was admitted to it.
- 3) God did not create living things directly but bade the earth and water to bring them forth.
- 4) Both 1 and 2
- 5) Neither 1 nor 2

35. The porcelain filters of the bacteriology laboratories owed their descent to

- 1) Pasteur's homeland
- 2) The well water of Montanvert that had been rendered germ free by slow filtration through sandy soil
- 3) Ingenious flask with S shaped necks used by Pasteur
- 4) Both 1 and 2
- 5) None of the above

36. What, according to the passage was Pasteur's declaration to the world?

- 1) Nobody could deny the work done by him
- 2) Science would forever be indebted to his experiments in bacteriology
- 3) The doctrine of spontaneous generation would never recover from the mortal blow dealt to it by his experiment.
- 4) Those who refused to acknowledge his experiments would regret their skepticism
- 5) None of the above

37. What according to the writer was the problem with the proponents of spontaneous generation?

- 1) Their work had no scientific basis
- 2) Their work was ruined by experimental errors
- 3) Their work was based on religious beliefs
- 4) Both 1 and 2
- 5) Neither 1 nor 2

38. One of the results of the theoretical cross fire regarding bacteriology was that

- 1) partial sterilization as a possibility was ruled out
- 2) aseptic technique was introduced in surgery
- 3) the meaning of sterile was clear to all

- 4) all of the above
- 5) none of the above

39. One of the reasons for the conflict caused by Pasteur's experiments was that

- 1) they derived the existence of God as the creator
- 2) they seemed simultaneously to support the Biblical account of creation while denying a variety of other philosophical systems
- 3) academicians and scientists refused to accept his theories.
- 4) there were too many debates on the topic and this left the people confused
- 5) none of the above

40. According to the author

- 1) It is an exaggeration to say that cell theory represents biology's most significant and fruitful advance.
- 2) Pasteur could not hold his own against the contenders
- 3) Cell theory rendered null and void all the other bacteriological theories of the time
- 4) The emergence of the cell theory represents biology's most significant and fruitful advance
- 5) None of the above

PART - III

41. For how many positive integer, a, is it true that $a^2 \leq 2a$?

- | | |
|----------------|------|
| 1) 0 | 2) 1 |
| 3) 2 | 4) 4 |
| 5) 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

- | | |
|-------|------|
| 1) 0 | 2) 3 |
| 3) 4 | 4) 6 |
| 5) 24 | |

43. If $-7 \leq x \leq 7$ and $0 \leq y \leq 12$, the greatest possible value of $y - x$ is

- | | |
|-------|-------|
| 1) 19 | 2) 5 |
| 3) 7 | 4) 17 |
| 5) 19 | |

44. If $0 < x < 1$, which one of the following lists the numbers in increasing order?

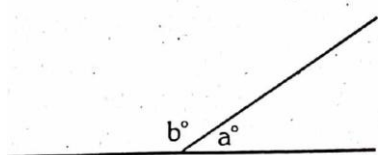
- | | |
|-----------------------|-----------------------|
| 1) \sqrt{x}, x, x^2 | 2) x^2, x, \sqrt{x} |
|-----------------------|-----------------------|

- 3) x^2, \sqrt{x}, x 4) x, x^2, \sqrt{x}
 5) 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?

- 1) Rs. 96 2) Rs. 100
 3) Rs. 112 4) Rs. 120
 5) Rs. 125

46. In the diagram below, $b : a = 7 : 2$. What is $b - a$?



- 1) 20 2) 70
 3) 100 4) 110
 5) 160

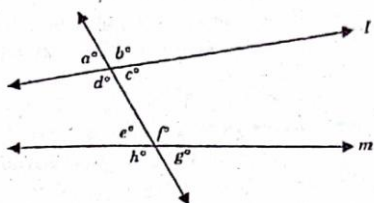
47. Many's average (arithmetic mean) on 4 tests is 80. Assuming she can earn no more than 100 on any test, what is the least she can earn on her fifth test and still have a chance for an 85 average after seven tests?

- 1) 60 2) 70
 3) 75 4) 80
 5) 85

48. If $a + b = 3(c + d)$, which one of the following is the average (arithmetic mean) of a, b, c , and d ?

- 1) $\frac{c+d}{4}$ 2) $\frac{3(c+d)}{8}$
 3) $\frac{c+d}{2}$ 4) $\frac{3(c+d)}{4}$
 5) $c + d$

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?

- 1) $A = 45$ 2) $45 < A < 90$
 3) $A = 90$ 4) $90 < A < 180$
 5) $A = 180$

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?

- 1) 45 2) 48
 3) 50 4) 52
 5) 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?

- 1) 120 2) 135
 3) 150 4) 184
 5) 200

52. The volume of two cylinders are as $a : b$, and their heights are as $c : d$. The ratio of their diameters is

- 1) $\frac{ad}{bc}$ 2) $\frac{ad^2}{bc^2}$
 3) $\sqrt{\frac{ad}{bc}}$ 4) $\frac{c}{d} \sqrt{\frac{a}{b}}$
 5) $\frac{ab}{cd}$

53. Three distinct numbers x, y, z form a geometric progression in that order, and $x + y, y + z, z + x$ form an arithmetic progression in that order. The common ratio of the geometric progression is

- 1) -2 2) 2
 3) 0.5 4) -0.5
 5) 3

54. The medians AD, BE and CF of a triangle ABC intersect at G . Which one of the following is true for any $\triangle ABC$?

- 1) $GB + GC = 2GA$ 2) $GB + GC < GA$
 3) $GB + GC > GA$ 4) $GB + GC = GA$
 5) 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

- 1) $r_1 + r_2 + r_3$
- 2) $r_1 - r_2 + r_3$
- 3) $r_1 + r_2 - r_3$
- 4) $r_1 - r_2 - r_3$
- 5) Cannot be determined

56. Simplify : $\frac{\cos 60^\circ + \sin 60^\circ}{\cos 60^\circ - \sin 60^\circ}$

- 1) $\sqrt{3} - 2$
- 2) $\sqrt{3} + 2$
- 3) $-(\sqrt{3} - 2)$
- 4) 1
- 5) -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

- 1) 1
- 2) 2
- 3) 2
- 4) -2
- 5) 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

- 1) 28 cm
- 2) 42 cm
- 3) 56 cm
- 4) 64 cm
- 5) 14 cm

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

- 1) 650 km/hr
- 2) 750 km/hr
- 3) 850 km/hr
- 4) 1000 km/hr
- 5) None of the above

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

- 1) 56
- 2) 64
- 3) 80
- 4) 24
- 5) 46

PART - IV

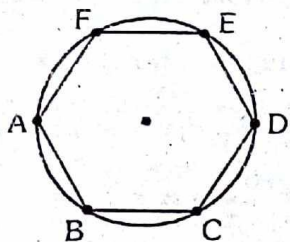
Directions :

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

1. If you can get the answer from (1) ALONE but not from (2) alone.
2. If you can get the answer from (2) ALONE but not from (1) alone.
3. If you can get the answer from BOTH (1) and (2) TOGETHER, but not from (1) alone or (2) alone
4. If EITHER statement (1) ALONE or Statement (2) ALONE suffices.
5. If you CANNOT get the answer from statement (1) and (2) TOGETHER, but need even more data.

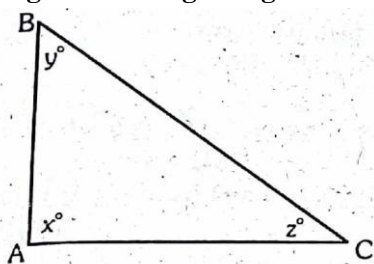
Questions :

61. Plane X flies at r miles per hour from A to B. Plane Y flies at S miles per hour from B to A. Both planes take off at the same time. Which plane flies at a faster rate? Town C is between A and B?
 - 1) C is closer to A than it is to B
 - 2) 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?
 - 1) The ratio of red marbles to green marbles is 2 : 1
 - 2) There are 20 green marbles in the jar
63. The integers ABCDEF is inscribed in the circle with center O. What is the length of AB?



- 1) The radius of the circle is 4 inches.
- 2) The hexagon is a regular hexagon. That means all the sides have the same length and all its interior angles are same.

64. Is angle BAC a right angle?

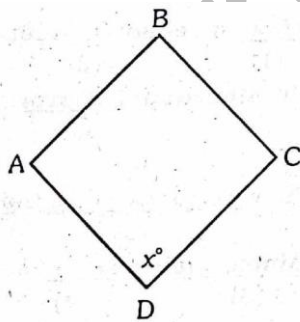


- 1) $x = 2y$
- 2) $y = 1.5z$

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.

- 1) The three-digit number abc is a multiple of 9
- 2) $(a \times b) + c$ is a multiple of 9

66. Is the figure ABCD a rectangle?



- 1) $x = 90$
- 2) $AB = CD$

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

- 1) Conveyor belt A moves twice as much coal as conveyor belt B.

2) Conveyor belt B would take 3 hours to fill the hopper without conveyor belt A.

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

- 1) Thiru's weight plus Maya's weight is equal to Jaga's weight.
- 2) 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 $x^3 - y^3$?

- 1) x is positive
- 2) y is greater than 1

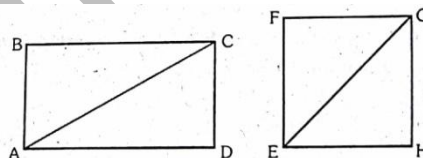
70. How many of the numbers x , y , and z are positive? x , y and z are all less than 30.

- 1) $x + y + z = 61$
- 2) $x + y = 35$

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

- 1) 60,00,000 Indian cars were sold in 2005.
- 2) A total of 75,00,000 cars were sold in 2005.

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



- 1) $AC = EG$, $AB = \frac{1}{2} EH$
- 2) 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.

- 1) x is less than 5
- 2) $x + y = 24$

74. Is $xy < 0$?

- 1) $x > 2$
- 2) $y > -1$

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

- 1) $a = 1$
- 2) $b > 2$

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?

- 1) One unit of type A widget requires 2 machine hours and one unit of type B widget requires 4 machine hours.
- 2) 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?

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

2) 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?

1) $2X + 2Y \leq 40$

2) $X - 2Y \geq 20$

79. 10 boys went to a neighbouring orchard. Each boy stole a few mangoes. What is the total number of mangoes they stole?

1) The first boy stole 4 mangoes, the fourth boy stole 16 mangoes, the eighth boy stole 32 mangoes and the tenth boy stole 40 mangoes.

2) 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?

1) $PB > RE$, $BQ = ES$

2) B is a point on PQ, E is a point on RS.

PART - V

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 (1) (2)
will have to start from the scratch. (3) (4)
No error. (5)

83. Five litres of petrol are not enough to cover (1) (2) (3)

the distance. No error.

(4) (5)

84. Since the under trial gave a slip to the (1) (2)
escorting policeman, his whereabouts are (3) (4)
not known. No error. (5)

85. Neither the officer nor his subordinates (1) (2)
bothers about the situation. No error. (3) (4) (5)

86. When he was admitted in the hospital he (1) (2)
was complaining against severe headache. (3) (4)

No error.

(5)

87. Nothing and no one escape my attention. (1) (2) (3) (4)

No error.

(5)

88. Kanchenjunga is one of the beautiful peak (1) (2)
of the Himalayan range. No error. (3) (4) (5)

89. He has become so weak that even (1) (2)
a two furlong's walk makes him breathless. (4)

No error.

(5)

90. She can sing better than me but she isn't as (1) (2) (3)
pretty as I. No error. (4) (5)

91. Although she had not read much, she had (1) (2)
the capacity of choosing the right word in (3)

the right context. No error.

(4) (5)

92. The difference between good and bad acting (1)
rest in the ability to project emotion to the (2) (3) (4)

audience. No error.

(5)

93. Projecting emotion to an audience requires
(1) (2)
control of the voice, restrained use of
gesture, and a mysterious gift, called "stage
(3)
presence," which makes everything work.
(4)

No error.

(5)

94. Notwithstanding my respect for the two
(1)
men's abilities, I have difficulty deciding
(2) (3)
which of their productions of Romeo and
(4)
Juliet was the worse. No error.
(5)

95. Before he is good enough to make the team,
(1)
he will learn to train consistently, to pace
(2)
himself in races, and to eat and sleep
(3) (4)
properly. No error.
(5)

96. A depressed economy in the local area and a
tight money policy in Washington were
(1) (2)
the reasons for the many bankruptcies of

ANSWERS									
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
(2	(2	(3	(2	(1	(2	(4	(2	(3	(2)
))))))))))
1	1	1	1	1	1	1	1	1	20.
1.	2.	3.	4.	5.	6.	7.	8.	9.	(2)
(1	(3	(2	(4	(5	(2	(2	(1	(2)
))))))))))
2	2	2	2	2	2	2	2	2	30.
1.	2.	3.	4.	5.	6.	7.	8.	9.	(1)
(3	(2	(2	(2	(4	(5	(3	(3	(1)
))))))))))
3	3	3	3	3	3	3	3	3	40.
1.	2.	3.	4.	5.	6.	7.	8.	9.	(1)
(5	(4	(2	(4	(2	(3	(4	(1	(5)
))))))))))
4	4	4	4	4	4	4	4	4	50.

(3)

(4)

that year. No error.

(5)

97. Never had the American navy sank so many
(1) (2)
foreign warships as they did during that
(3) (4)
intitial battle. No error.
(5)
98. Each member fo the Rangers wore their
(1)
team emblem, which appeared on all
(2) (3)
articles of clothing. No error.
(4) (5)
99. The truck rumbled by with a great noise,
(1)
which prevented me hearin the knock on
(2) (3) (4)
the door. No error.
(5)
100. It says in this morning's newspaper that
(1) (2)
much wheat has been grown on the plains
(3)
in the Middle West inspite of severe
(4)
windstorms. No error.
(5)

1.	2.	3.	4.	5.	6.	7.	8.	9.	(2)
(3	(2	(5	(2	(4	(3	(3	(5	(3)
))))))))))
5	5	5	5	5	5	5	5	5	60.
1.	2.	3.	4.	5.	6.	7.	8.	9.	(2)
(5	(3	(1	(3	(3	(3	(4	(3	(2)
))))))))))
6	6	6	6	6	6	6	6	6	70.
1.	2.	3.	4.	5.	6.	7.	8.	9.	(1)
(5	(4	(3	(3	(1	(5	(4	(3	(3)
))))))))))
7	7	7	7	7	7	7	7	7	80.
1.	2.	3.	4.	5.	6.	7.	8.	9.	(3)
(4	(4	(2	(5	(3	(3	(1	(3	(5)
))))))))))
8	8	8	8	8	8	8	8	8	90.
1.	2.	3.	4.	5.	6.	7.	8.	9.	(4)

(3)	(3)	(2)	(1)	(3)	(3)	(2)	(2)	(3)	
9	9	9	9	9	9	9	9	9	10
1.	2.	3.	4.	5.	6.	7.	8.	9.	0.
(1)	(2)	(4)	(5)	(1)	(5)	(2)	(1)	(1)	(1)

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MBA 2011 –DETAILED SOLUTIONS

1. (2)
The total cost of press was important in determining the new price and distribution channels.
2. (2)
Adoption of new service policy was major factor in the consideration of distribution channel alternative.
3. (3)
The price of a new press comprised manufacturing cost, delivery cost, instruction, training and service. But service expense was only one consideration in the pricing and channel selection decision.
4. (2)
Lack of selling effort on Grace's part was a major factor in selecting new distributing channel.
5. (1)
The desire for broader distribution is an outcome sought by the decision maker.
6. (2)
Complaints from buyers were one of the several factors contributing to the outcome sought.
7. (4)
The word "Possibility" clearly suggests that it is an assumption.
8. (2)
Groce products was a major consideration in a decision alternative.
10. (2)
Lack of selling effort on Grace's part was a major factor in selecting new distribution channel.
11. (1)
Perrier management's marketing objective was to position the product as a "thirst quencher with no calories..." (paragraph 9). Management also aimed the product at the mass market by completing in the soft-drink market segment" (Paragraph 7).
12. (3)
Of all the qualities of Perrier, its therapeutic value was less valuable because of the inability to advertise it in the United States (Paragraph 9)
13. (2)
The growing diet-consciousness of Americans (Paragraph 1) was a Major Factor in the decision to market Perrier in the United States.
14. (4)
Management "reasoned" that the retail price could be cut by 30 percent. The price could only be cut through a mass distribution policy, which is a major supposition on the part of management.
15. (5)
Perrier's success in France did not influence the consideration of an alternative of action in the United States.
16. (2)
The advantage of mineral water (over other types of spring water, soft drinks etc.) is a major consideration in the selection of an alteration course of action.
17. (2)
A slowdown in the growth of Perrier sales in France was a Major Factor in the consideration to investigate the American market. See the introductory paragraph.
18. (1)
Once Perrier had decided to market in the United States, a Major Objective of management was finding what particular market in which to sell the product.
19. (2)
After achieving initial success in the United States, Perrier was imitated by American bottlers (paragraph 10). The increased competition was a Major Factor in Perrier's review of its marketing strategy. See the final paragraph.
20. (2)
U.S. advertising legislation was a Minor Factor in the consideration of advertising appeals, which was a Major Objective For example, the passage states that in Europe Perrier could make therapeutic claims, but in the U.S. it could not, owing to the U.S. law (paragraph 9).

41. (3)

When $a = 1$ then
 $a^2 = 1$;
 $2a = 2 \times 1 = 2$
 $\therefore a^2 < 2a$

When $a = 2$, then
 $a^2 = 4$;
 $2a = 2 \times 2 = 4$
 $\therefore a^2 \leq 2a$

\therefore For $a = 1, 2$
 $a^2 \leq 2a$

42. (2)

Consider the 4 consecutive integers 0, 1, 2, 3
 Product $= 0 \times 1 \times 2 \times 3 = 0$
 [0 is one of the 4 consecutive integer]
 \therefore Largest among 4 consecutive integer $= 3$

43. (5)

$-7 \leq 7 \leq 7$
 $0 \leq y \leq 12$
 if y is maximum and x is minimum, then $y-x$ is maximum.
 \therefore Greatest possible value of $y-x$

$$= 12 - (-7) \\ = 19$$

44. (2)

In this type of problems, we can check the options by assigning some particular value for x .
 $0 < x < 1$

Take $x = \frac{1}{4}$
 then $x^2 = \frac{1}{16}$
 $\sqrt{x} = \sqrt{\frac{1}{4}} = \frac{1}{2}$

Clearly $\frac{1}{16} < \frac{1}{4} < \frac{1}{2}$

i.e. $x^2 < x < \sqrt{x}$

\therefore Increasing order is x^2, x, \sqrt{x}

45. (4)

Cost price $=$ Rs. 80
 Profit $= 20\%$
 Selling price $= \left(\frac{100 + \text{Profit } \%}{100} \right) \times \text{cost price}$
 $= \frac{100 + 20}{100} \times 80$
 $= \frac{120}{100} \times 80$
 $=$ Rs. 96

Let the market price be Rs. M

Discount $= 20\%$

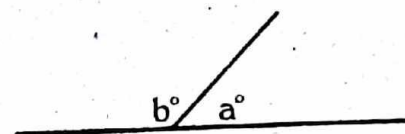
$\therefore 80\%$ of $M =$ Selling price

$\frac{80}{100} \times M = 96$

$\therefore M = \frac{96 \times 100}{80} =$ Rs. 120

\therefore Marked Price $=$ Rs. 120

46. (3)



Clearly a and b are supplementary angles. That is $a^\circ + b^\circ = 180^\circ$

Now $b : a = 7 : 2$
 $b = \frac{7}{7+2} \times 180$
 $= \frac{7}{9} \times 180 = 140^\circ$
 $a = \frac{2}{7+2} \times 180$
 $= \frac{2 \times 180}{9} = 40^\circ$
 $b - a = 140 - 40 = 100$

47. (3)

Average of 4 tests $= 80$

\therefore Total of 4 tests $= 4 \times 80 = 320$

If Mary earn maximum marks (100) in sixth and seventh tests and average of seven tests is 85, then marks in fifth test is minimum.

Let the marks earned in fifth test be x

Then average of seven tests
 $= \frac{320 + x + 100 + 100}{7} = 85$

$520 + x = 7 \times 85 = 595$

$\therefore x = 595 - 520 = 75$

\therefore Least marks in fifth test $= 75$

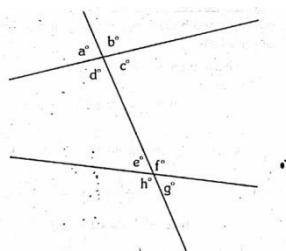
48. (5)

$a + b = 3(c+d)$

Average of a, b, c, d

$$= \frac{a+b+c+d}{4} \\ = \frac{(a+b)+(c+d)}{4} \\ = \frac{3(c+d)+(c+d)}{4} \\ = c + d$$

49. (3)



From the above figure

$$a + b + c + d = 360$$

$$e + f + g + h = 360$$

Average of all eight angles

$$\begin{aligned} &= \frac{a+b+c+d+e+f+g+h}{8} \\ &= \frac{(a+b+c+d)+(e+f+g+h)}{8} \\ &= \frac{360+360}{8} \\ &= \frac{720}{8} = 90 \end{aligned}$$

50. (2)

Time taken to read for first 100 pages

$$= \frac{100}{60} = \frac{5}{3} \text{ hrs}$$

Time taken to read next 100 pages

$$= \frac{100}{40} = \frac{5}{2} \text{ hrs}$$

$$\begin{aligned} \text{Average rate} &= \frac{\text{Total Pages}}{\text{Total time taken}} \\ &= \frac{100+100}{\frac{5}{3} + \frac{5}{2}} = \frac{200}{\frac{10+15}{6}} \\ &= \frac{200 \times 6}{25} = 48 \end{aligned}$$

51. (5)

$$R + W + B = 470 \dots (1)$$

$$R = \frac{4}{5}W \dots (2)$$

$$W = \frac{3}{4}B \dots (3)$$

$$\begin{aligned} \therefore (2) \Rightarrow R &= \frac{4}{5}W = \frac{4}{5} \times \frac{3}{4}B \\ &= \frac{3}{5}B \end{aligned}$$

$$(1) \Rightarrow R + W + B = 470$$

$$\frac{3}{5}B + \frac{3}{4}B + B = 470$$

$$\Rightarrow \frac{12B + 15B + 20B}{20} = 470$$

$$\frac{47B}{20} = 470$$

$$\therefore B = \frac{470 \times 20}{47} = 200$$

\therefore Number of blue marbles = 200

52. (3)

Heights are in the ratio c:d

Let the heights be cx and dx

Let the base radius of two cylinders be r_1 and r_2 .

Then ratio of their volumes = a : b

$$\begin{aligned} \Rightarrow \frac{\pi r_1^2 cx}{\pi r_2^2 cx} &= \frac{a}{b} \\ \frac{r_1^2 c}{r_2^2 d} &= \frac{a}{b} \\ \frac{r_1^2}{r_2^2} &= \frac{ad}{bc} \end{aligned}$$

$$\Rightarrow \frac{r_1}{r_2} = \sqrt{\frac{ad}{bc}}$$

$$\text{Ratio of diameters } \frac{2r_1}{2r_2} = \frac{r_1}{r_2} = \frac{\sqrt{ad}}{\sqrt{bc}} = \frac{\sqrt{ad}}{\sqrt{bc}}$$

53. (1)

x, y, z are in Geometric progression

Then $y = rx$; $z = r^2x$

Where r is the common ratio

Now

x+y, y+z, z+x are in Arithmetic progression

$$\begin{aligned} \Rightarrow 2(y+z) &= (x+y) + (z+x) \\ &= 2x + (y+z) \end{aligned}$$

$$\Rightarrow y+z = 2x$$

$$\Rightarrow rx + r^2x = 2x$$

$$\Rightarrow r + r^2 = 2$$

$$\Rightarrow r^2 + r - 2 = 0$$

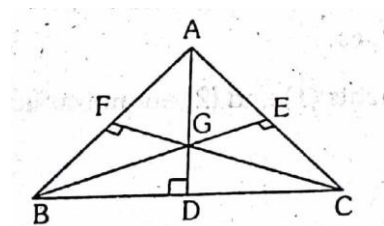
$$(r+2)(r-1) = 0$$

$$\Rightarrow r = -2 \text{ (or) } 1$$

From given options $r = -2$

\therefore Option (1) is correct.

54. (3)



By formula

$$\frac{GB}{GE} = \frac{GC}{GF} = \frac{GA}{GD} = \frac{2}{1} \dots (i)$$

Consider right triangle BGD

Since BG is hypotenuse in ΔBGD ,

$GB > GD$

Similarly

$GC > GD$

Adding

$$GB + GC > 2GD$$

$$\Rightarrow GB + GC > GA$$

[By (i) $GA = 2GD$]

55. (3)

We check through example

Let the divisor be 10

Let $P = 46$, then $r_1 = 6$

$Q = 58$, then $r_2 = 8$

Now $P + Q = 46 + 58 = 104$

$r_3 =$ Remainder when 104 is divided by 10 = 4

Clearly

$$\begin{aligned} r_1 + r_2 - r_3 &= 6 + 8 - 4 \\ &= 10 = \text{divisor} \end{aligned}$$

56. (3)

$$\begin{aligned} \frac{\cos 60 + \sin 60}{\cos 60 - \sin 60} &= \frac{\frac{1}{2} + \frac{\sqrt{3}}{2}}{\frac{1}{2} - \frac{\sqrt{3}}{2}} = \frac{\left(\frac{1+\sqrt{3}}{2}\right)}{\left(\frac{1-\sqrt{3}}{2}\right)} \\ &= \frac{1+\sqrt{3}}{1-\sqrt{3}} \\ &= \frac{1+\sqrt{3}}{1-\sqrt{3}} \times \frac{1+\sqrt{3}}{1+\sqrt{3}} = \frac{(1+\sqrt{3})^2}{1^2 - (\sqrt{3})^2} \\ &= \frac{1+3+2\sqrt{3}}{1-3} = \frac{4+2\sqrt{3}}{-2} \\ &= -(2 + \sqrt{3}) \end{aligned}$$

57. (4)

Check through options

$$\begin{aligned} \text{when } m &= -2 \\ x^2 - x + 3m &= 0 \\ \Rightarrow x^2 - x - 6 &= 0 \\ \Rightarrow (x-3)(x+2) &= 0 \\ \text{Roots } x &= -2, 3 \\ x^2 - x + m &= 0 \\ \Rightarrow x^2 - x - 2 &= 0 \quad [m = -2] \\ \Rightarrow (x-2)(x+1) &= 0 \\ \Rightarrow x &= 2, -1 \end{aligned}$$

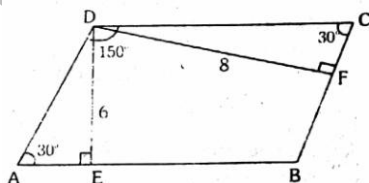
Clearly $-2 = 2 \times (-1)$

i.e.,

One of the root of $x^2 - x + 3m = 0$ is -2

Also -2 is double of one of the root of $x^2 - x + m = 0$

58. (3)



Consider $\triangle AED$

$$\frac{DE}{AD} = \sin 30^\circ = \frac{1}{2}$$

$$\therefore AD = 2DE = 2 \times 6 = 12$$

Since AD is parallel to BC $\Rightarrow BC = 12$

Consider $\triangle DEF$

$$\sin 30^\circ = \frac{DF}{DC}$$

$$\Rightarrow \frac{1}{2} = \frac{8}{DC} \Rightarrow DC = 16$$

Since AB is parallel to DC

$$\Rightarrow AB = 16$$

$$\begin{aligned} \therefore \text{Perimeter} &= AB + BC + CD + DA \\ &= 16 + 12 + 16 + 12 \\ &= 56 \text{ cm} \end{aligned}$$

59. (2)

Let the normal speed be x km/hr

$$\text{Then Actual time taken} = \frac{1500}{x}$$

$$\text{Increased speed} = x + 250$$

$$\text{In this case time taken} = \frac{1500}{x + 250}$$

Now

$$\begin{aligned} \frac{1500}{x} &= \frac{1500}{x+250} + \frac{1}{2} \\ \Rightarrow \frac{1500}{x} - \frac{1500}{x+250} &= \frac{1}{2} \\ \Rightarrow 1500 \left[\frac{1}{x} - \frac{1}{x+250} \right] &= \frac{1}{2} \\ \Rightarrow 1500 \left[\frac{5x+250-x}{x(x+250)} \right] &= \frac{1}{2} \\ \Rightarrow 1500x \frac{250}{x(x+250)} &= \frac{1}{2} \\ \Rightarrow x(x+250) &= 750000 \\ \Rightarrow x^2 + 250x - 750000 &= 0 \\ \Rightarrow x^2 + 1000x - 750x - 750000 &= 0 \\ \Rightarrow x^2(x+1000) - 750(x+1000) &= 0 \\ \Rightarrow (x-750)(x+1000) &= 0 \\ \Rightarrow x &= 750 \text{ (or)} -1000 \end{aligned}$$

x cannot be negative

Therefore normal speed = 750 km/hr.

60. (2)

$\frac{2}{3}$ of work is completed in 64 days.

$$\therefore \text{Full work is completed in } \frac{1}{\left(\frac{2}{3}\right)} \times 64$$

$$= \frac{3}{2} \times 64 = 96$$

$\therefore \frac{1}{3}$ of work is completed in 120 workers in

$$96 - 64 = 32 \text{ days}$$

Let $\frac{1}{3}$ of work is completed by x workers in

$$124 - 64 = 60 \text{ days}$$

$$\text{Then } M_1 D_1 W_2 = M_2 D_2 W_1$$

$$M_1 = 120; D_1 = 32; W_1 = \frac{1}{3}; M_2 = x; D_2 = 60;$$

$$W_2 = \frac{1}{3}$$

$$120 \times 32 \times \frac{1}{3} = x \times 60 \times \frac{1}{3}$$

$$\therefore x = \frac{120 \times 32}{60} = 64$$

61. (5)

Since C is closer to A, if plane X is flying faster than plane Y it will certainly fly over C before plane Y.

However, if plane X flies slower than plane Y, and C very close to A, plane X would still fly over C before plane Y does.

Therefore statements (1) and (2) are not sufficient.

62. (4)

From (1) alone

$$\text{Red : Green} = 2 : 1$$

$$\therefore \text{Red marbles} = \frac{2}{3} \times 60 = 40$$

$$\text{Green marbles} = 60 - 40 = 20$$

So we have to draw 21 marbles to make sure that a red marble is drawn. Smallest number = 21.

\therefore (1) alone is sufficient

Consider (2)

There are 20 green marbles

So, 21 marbles must be drawn to be certain that a red marble is drawn.

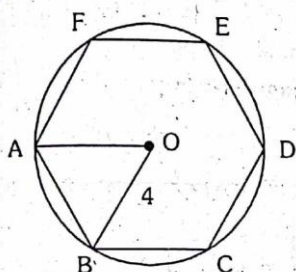
So, (2) alone is sufficient.

63. (3)

(1) alone is not sufficient

(2) alone is not sufficient

From (1) and (2)



If the hexagon is regular then $\triangle ABO$ is an equilateral triangle. That is all three sides are equal.

$$\Rightarrow AB = BO = AO$$

$$\text{Radius} = BO = 4$$

$$\therefore AB = BO = 4 \text{ inches}$$

64. (3)

(1) alone and (2) alone are not sufficient

$$x + y + z = 180$$

By (1) and (2)

$$x + y + z = 180$$

$$2y + y + z = 180$$

$$3y + z = 180$$

$$3(1.5z) + z = 180$$

$$4.5z + z = 180$$

$$5.5z = 180$$

$$\therefore \frac{11}{2}z = 180$$

$$\therefore z = \frac{2}{11}(180)$$

$$y = \frac{3}{2} \text{ of } z = \frac{3}{2} \text{ of } 180$$

$$x = \frac{6}{11} \text{ of } 180$$

Therefore $\angle BAC$ is not a right angle.

65. (1)

A number is divisible by (multiple of) 9 if and only

If sum of its digit is divisible by (multiple of) 9

Consider (1)

abc is multiple of 9

This implies sum of its digits $a + b + c$ is multiple of 9

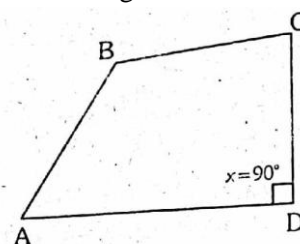
Therefore (1) alone is sufficient

(2) alone is not sufficient.

66. (5)

If ABCD has the pairs of opposite sides equal and each angle is 90° , then it is rectangle. But there are quadrilaterals with property (1) and (2).

In the following figure $AB = CB$ but $x = 90^\circ$ but it is not a rectangle



Therefore (1) and (2) together are not sufficient.

67. (4)

$$(A's 1 \text{ hour's work}) : (B's 1 \text{ hours work}) = 2 : 1$$

$$(A + B)'s 1 \text{ hour's work} = \frac{1}{1} = 1$$

Divide 1 in the ratio 2 : 1

$$\therefore A's 1 \text{ hour's work} = \frac{2}{3} \times 1 = \frac{2}{3}$$

$$\therefore A \text{ can complete the work in } \frac{3}{2} \text{ hours}$$

So (1) alone is sufficient

From (2)

$$B's 1 \text{ hour's work} = \frac{1}{3}$$

$$(A + B)'s 1 \text{ hour's work} = \frac{1}{1} = 1$$

$$\therefore A's 1 \text{ hour's work} = 1 - \frac{1}{3} = \frac{2}{3}$$

$$\therefore A \text{ can finish the work in } \frac{3}{2} \text{ hours}$$

So (2) alone is sufficient

68. (3)

Let the weights of Jaga

Thiru and Maya be J, T and M respectively.

$$\text{Then } T = 200$$

$$\text{By (1)} \quad T + M = J$$

$$\Rightarrow 200 + M = J$$

$$J - M = 200 \quad \dots (i)$$

From (2)

$$J + M = 2t$$

$$\Rightarrow J + M = 2 \times 200 = 400 \quad \dots (ii)$$

$$\text{From (i) and (ii)} \quad 2J = 600$$

$$J = 150$$

\therefore Both (1) and (2) are necessary

69. (3)

$$\text{Formula } a^2 - b^2 = (a + b)(a - b)$$

$$x^6 - y^6 = 0$$

$$(x^3 + y^3)(x^3 - y^3) = 0$$

$$\Rightarrow (x^3 + y^3) = 0 \text{ (or)}$$

$$x^3 - y^3 = 0$$

By (1) and (2) x is positive and $y > 1$

$$\therefore x^3 + y^3 = 0$$

$$\text{Therefore } x^3 - y^3 = 0$$

\therefore Statements (1) and (2) are necessary to derive the answer.

70. (1)

From (1)

$$x + y + z = 61 \quad \dots (i)$$

$$x < 30$$

$$y < 30$$

$$x + y < 60 \quad \dots (ii)$$

From (i) and (ii)

x, y, z all are positive

\therefore (1) alone is sufficient

(2) alone is not sufficient.

71.

(4)

Indian cars : Imported cars = 4 : 1

Let the Indian and imported cars sold be 4x and x respectively

By (1)

$$4x = 60,00,000$$

$$x = 15,00,000$$

\therefore imported cars sold in 2005

$$x = 15,00,000$$

(1) alone is sufficient

Consider (2)

$$4x + x = 75,00,000$$

$$5x = 75,00,000$$

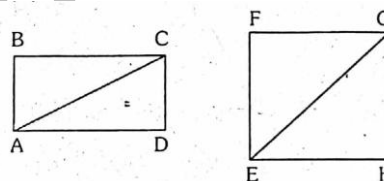
$$\therefore x = \frac{75,00,000}{5} = 15,00,000$$

Imported cars sold = 15,00,000

\therefore (2) alone is sufficient.

72.

(4)



Consider (1)

$$\begin{aligned} \Rightarrow BC &= \sqrt{(AC)^2 - (AB)^2} \\ &= \sqrt{(EG)^2 - \frac{1}{4}(EH)^2} \quad \dots (i) \end{aligned}$$

Since $(EG)^2 = 2(EH)^2$ [EFGH is a square]

$$\begin{aligned} (i) \Rightarrow BC &= \sqrt{2(EH)^2 - \frac{1}{4}(EH)^2} \\ &= EH \sqrt{2 - \frac{1}{4}} = \frac{\sqrt{7}EH}{2} \end{aligned}$$

$$\text{By (1)} \quad AB = \frac{1}{2}EH$$

\therefore Area of ABCD = AB.BC

$$\begin{aligned} &= \frac{1}{2}EH \cdot \frac{\sqrt{7}}{2}EH \\ &= \frac{\sqrt{7}}{4}(EH)^2 \end{aligned}$$

Area of the square EFGH

$$= \frac{(EH)^2}{2}$$

\therefore Areas are not equal.

(1) alone is sufficient

Consider (2)

area $\Delta ABC \neq$ area ΔEFG

$\Rightarrow 2 \times \text{area } \Delta ABC \neq 2 \times \text{area } EFG$

$\Rightarrow \text{area } ABCD \neq \text{Area } EFGH$

(2) alone is sufficient

73. (2)

(1) alone is not sufficient

From (2) $x + y = 24$

\therefore The numbers are

$(x, y) = (19, 5), (18, 6), (17, 7), \dots$

So we can derive the answer

\therefore The correct choice is 2.

74. (5)

$x > 2$ and $y > -1$

From (1) and (2)

When $x = 3$ and $y = 2$

$$xy = 3 \times 2 = 6 > 0$$

When $x = 3$ and $y = -\frac{1}{2}$

$$xy = 3 \times \left(-\frac{1}{2}\right) = -\frac{3}{2} < 0$$

\therefore Given data are not sufficient

75. (3)

(1) alone is not sufficient

(2) alone is not sufficient

Consider (1) and (2)

By (1) $a^b = 1^b = 1$; $b^a = b^1 = b$

Consider (2)

By (2) $b > 2$

$$\therefore a^b = 1 < 2 < b = b^a$$

$$\therefore a^b < b^a$$

b^a is larger

76. (3)

(1) alone is not sufficient

(2) alone is not sufficient

From (1) and (2)

$$10 \times 2 + 15 \times 4 = 80$$

Number of widget of type A produced = 10 units

77. (4)

Consider the four numbers a, b, c, d

Such that $a < b < c < d$

From statement (1)

$$d - c > b - a \Rightarrow d + a > b + c$$

Now

$$\frac{a+b+c+d}{4} = \frac{(a+d)+(b+c)}{4}$$

$$< \frac{(a+d)+(a+d)}{4} = \frac{2(a+d)}{4} = \frac{(a+d)}{2}$$

Average of four numbers is less than average of the largest and smallest

(1) alone is not sufficient

(2) alone is not sufficient

78. (3)

(1) alone is not sufficient

(2) alone is not sufficient

Consider (1) and (2)

When x and y are non negative solution of $x + y \leq 20$ and $X - 2Y \geq 20$ is $(X, Y) = (20, 0)$.

Therefore the value of $X = 20$

79. (5)

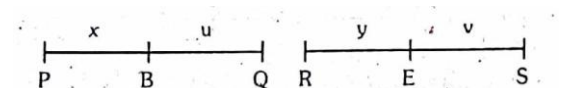
Instatements (1) and (2) number of mangoes stolen by, 2nd, 3rd, 5th, 6th, 7th, 9th boys are not given. Therefore we cannot final total mangoes stolen. (1) and (2) are not sufficient.

80. (3)

(1) alone is not sufficient

(2) alone is not sufficient

By (2) B is a point on PQ and E is a point on RS



Let $PB = x$; $RE = y$

$BQ = u$; $ES = v$

By (1) $PB > RE \Rightarrow x > y$ (i)

$BQ = ES \Rightarrow u = v$ (ii)

Add (i) and (ii)

$$x + u > y + v$$

$$\Rightarrow PQ > RS$$

\therefore (1) and (2) are necessary to derive the answer.

81. (3)

Change as "can visit"

82. (3)

Change as "have". (delete will)

83. (2)

Change "are" as "is"

84. (1)

Change since as "As"

85. (3)


Change "brothers" as bother"

86. (3)

87. Change as "complaining of"
(2)
Change as "none"
88. (2)
Change as "peaks"
89. (3)
Change as "two furlongs"
90. (4)
Change as "I am"
91. (1)
Change as "Though"
92. (2)
Change as "rests"
100. (1)
Change as "This morning's newspaper".

93. (4)
Change as "makes"
94. (5)
95. (1)
Delete "make"
96. (5)
97. (2)
Change as "sunk"
98. (1)
Change as "his"
99. (1)
Change as "rumbled with"

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