

# CAT 1997 Paper

## Section – I

**Direction for questions 1 to 6:** In each of the following questions, a related pair of words is followed by four pairs of words or phrases. Select the pair that best expresses a relationship similar to the one expressed in the question pair.

1. Peel : Peal
 

a. Coat : Rind	b. Laugh : Bell
c. Rain : Reign	d. Brain : Cranium
  
2. Doggerel : Poet
 

a. Symphony : Composer	b. Prediction : Astrologer
c. Wine : Vintner	d. Pulp fiction : Novelist
  
3. Premise : Conclusion
 

a. Assumption : Inference	b. Hypothesis : Theory
c. Knowledge : Ideas	d. Brand : Marketing
  
4. Barge : Vessel
 

a. Shovel : Implement	b. Book : Anthology
c. Rim : Edge	d. Training : Preparation
  
5. Love : Obsession
 

a. Happiness : Joy	b. Amity : Harmony
c. Enemy : Hatred	d. Sorrow : Misery
  
6. Reptile : Adder
 

a. Skeleton : Flesh	b. Method : System
c. Plant : Genus	d. Dinosaur : Tyrannosaurus

**Direction for questions 7 to 11:** Each of the following questions contains six statements followed by four sets of combinations of three. You have to choose that set in which the third statement logically follows from the first two.

7.
 

A. No bird is viviparous.	B. All mammals are viviparous.		
C. Bats are viviparous.	D. No bat is a bird.		
E. No bird is a mammal.	F. All bats are mammals.		
a. ADC	b. ABE	c. FBA	d. AFC
  
8.
 

A. No mother is a nurse.	B. Some nurses like to work.		
C. No woman is a prude.	D. Some prude are nurses.		
E. Some nurses are women.	F. All women like to work.		
a. ABE	b. CED	c. FEB	d. BEF

9. A. Oranges are sweet. B. All oranges are apples.  
 C. Some sweet are apples. D. Some oranges are apples.  
 E. All sweet are sour. F. Some apples are sour.  
 a. DAC b. CDA c. BCA d. FEC
10. A. Zens are Marutis. B. Zens are fragile.  
 C. Marutis are fragile. D. Opels are fragile.  
 E. Marutis are Opels. F. Opels are stable.  
 a. ACB b. EFD c. CEA d. ABC
11. A. Dogs sleep in the open. B. Sheep sleep indoors.  
 C. Dogs are like sheep. D. All indoors are sheep.  
 E. Some dogs are not sheep. F. Some open are not sheep.  
 a. AFE b. DCA c. ABE d. FBD

**Direction for questions 12 to 16:** In each of the following sentences, the main statement is followed by four sentences each. Select a pair of sentences that relate logically to the given statement.

12. Either Sam is ill, or he is drunk.  
 A. Sam is ill. B. Sam is not ill.  
 C. Sam is drunk. D. Sam is not drunk.  
 a. AB b. DA c. AC d. CD
13. Whenever Ram hears of a tragedy, he loses sleep.  
 A. Ram heard of a tragedy. B. Ram did not hear of a tragedy.  
 C. Ram lost sleep. D. Ram did not lose sleep.  
 a. CA b. BD c. DB d. AD
14. Either the train is late, or it has derailed.  
 A. The train is late. B. The train is not late.  
 C. The train is derailed. D. The train is not derailed.  
 a. AB b. DB c. CA d. BC
15. When I read a horror story I have a nightmare.  
 A. I read a story. B. I did not read a horror story.  
 C. I did not have a nightmare. D. I had a nightmare.  
 a. CB b. AD c. BC d. AC
16. When I eat berries I get rashes.  
 A. I ate berries. B. I did not get rashes.  
 C. I did not eat berries. D. I got rashes.  
 a. DA b. BC c. CB d. None of these

**Direction for questions 17 to 21:** In each of the following questions, a part of the paragraph or sentence has been underlined. From the choices given, you are required to choose the one, which would best replace the underlined part.

17. This government has given subsidies to the Navratnas but there is no telling whether the subsequent one will do.
- a. whether the subsequent government will do so
  - b. if the government to follow will accept the policy
  - c. if the government to follow will adhere to the policy
  - d. whether the subsequent one will do so
18. Rahul Bajaj has done a great job of taking the company to its present status, but it is time that he let go off the reins.
- a. let go of the reins
  - b. stepped down
  - c. let go off the reins
  - d. delegated responsibility
19. With the pick up in the standard of education, expensive private schools have started blooming up in every corner of the country.
- a. started blooming in every corner of the country
  - b. started mushrooming all over the country
  - c. started mushrooming in every corner of the country
  - d. blossomed all over the country
20. It is important that whatever else happens, these two factors should not be messed around with.
- a. It is important that
  - b. It is a fact that
  - c. It should be urgently understood that
  - d. It should be understood that
21. It must be noticed that under no circumstance should the company go in for diversification.
- a. It must be noticed
  - b. It must be noted
  - c. It must be pointed out
  - d. It should be noticed

**Direction for questions 22 to 29:** In each of the following questions, a part of a sentence has been left blank. Select from among the four options given below each question, the one which would best fill in the blank.

22. An act of justice closes the book on a misdeed; an act of vengeance \_\_\_\_.
- a. is reprehensible
  - b. is sordid
  - c. reopens the first chapter
  - d. writes an epilogue
23. This is about \_\_\_\_ a sociological analysis can penetrate.
- a. as far as
  - b. the outer limits that
  - c. just how far into the subject
  - d. just the relative distance that





36. A. Chemists mostly don't stock it: only a few government hospitals do but in limited quantities.  
 B. Delhi's building boom is creating a bizarre problem: snakes are increasingly biting people as they emerge from their disturbed underground homes.  
 C. There isn't enough anti-snake serum, largely because there is no centralised agency that distributes the product.  
 D. If things don't improve, more people could face paralysis, and even death.  
 a. BCAD                      b. DBCA                      c. ABCD                      d. CABD
37. A. But the last decade has witnessed greater voting and political participation by various privileged sections.  
 B. If one goes by the earlier record of mid-term elections, it is likely that the turnout in 1998 will drop by anything between four and six percentage points over the already low polling of 58 per cent in 1996.  
 C. If this trend offsets the mid-term poll fatigue, the fall may not be so steep.  
 D. Notwithstanding a good deal of speculation on this issue, it is still not clear as to who benefits from a lower turnout.  
 a. BACD                      b. ABCD                      c. DBAC                      d. CBDA
38. A. After several routine elections there comes a 'critical' election which redefines the basic pattern of political loyalties, redraws political geography and opens up political space.  
 B. In psephological jargon, they call it realignment.  
 C. Rather, since 1989, there have been a series of semi-critical elections.  
 D. On a strict definition, none of the recent Indian elections qualifies as a critical election.  
 a. ABCD                      b. ABDC                      c. DBAC                      d. DCBA
39. A. Trivial pursuits marketed by the Congress, is a game imported from Italy.  
 B. The idea is to create an imaginary saviour in times of crisis so that the party doesn't fall flat on its collective face.  
 C. Closest contenders are Mani Shankar Aiyar, who still hears His Master's Voice and V. George, who is frustrated by the fact that his political future remains Sonia and yet so far.  
 D. The current champion is Arjun for whom all roads lead to Rome, or in this case, 10 Janpath.  
 a. ABDC                      b. ABCD                      c. DCBA                      d. CDBA
40. A. Good advertising can make people buy your products even if it sucks.  
 B. A dollar spent on brainwashing is more cost-effective than a dollar spent on product improvement.  
 C. That's important because it takes pressure off you to make good products.  
 D. Obviously, there's a minimum quality that every product has to achieve: it should be able to withstand the shipping process without becoming unrecognizable.  
 a. BACD                      b. ACBD                      c. ADCB                      d. BCDA
41. A. Almost a century ago, when the father of the modern automobile industry, Henry Ford, sold the first Model T car, he decided that only the best would do for his customers.  
 B. Today, it is committed to delivering the finest quality with over six million vehicles a year in over 200 countries across the world.



## Section – II

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**Direction for questions 51 to 100:** Read the passages given below carefully and answer the questions that follow.

### Passage – 1

I think that it would be wrong to ask whether 50 years of India's Independence are an achievement or a failure. It would be better to see things as evolving. It's not an either-or question. My idea of the history of India is slightly contrary to the Indian idea. India is a country that, in the north, outside Rajasthan, was ravaged and intellectually destroyed to a large extent by the invasions that began in about AD 1000 by forces and religions that India had no means of understanding.

The invasions are in all the schoolbooks. But I don't think that people understand that every invasion, every war, every campaign, was accompanied by slaughter, a slaughter always of the most talented people in the country. So these wars, apart from everything else led to a tremendous intellectual depletion of the country. I think that in the British period, and in the 50 years after the British period, there has been a kind of regrouping or recovery, a very slow revival of energy and intellect. This isn't an idea that goes with the vision of the grandeur of old India and all that sort of rubbish. That idea is a great simplification and it occurs because it is intellectually, philosophically easier for Indians to manage.

What they cannot manage, and what they have not yet come to terms with, is that ravaging of all the north of India by various conquerors. That was ruined not by the act of nature, but by the hand of man. It is so painful that few Indians have begun to deal with it. It is much easier to deal with British imperialism. That is a familiar topic, in India and Britain. What is much less familiar is the ravaging of India before the British.

What happened from AD 1000 onwards, really, is such a wound that it is almost impossible to face. Certain wounds are so bad that they can't be written about. You deal with that kind of pain by hiding from it. You retreat from reality. I do not think, for example, that the Incas of Peru or the native people of Mexico have ever got over their defeat by the Spaniards. In both places the head was cut off. I think the pre-British ravaging of India was as bad as that.

In the place of knowledge of history, you have various fantasies about the village republic and the Old Glory. There is one big fantasy that Indians have always found solace in: about India having the capacity for absorbing its conquerors. This is not so. India was laid low by its conquerors. I feel the past 150 years have been years of every kind of growth. I see the British period and what has continued after that as one period. In that time, there has been a very slow intellectual recruitment. I think every Indian should make the pilgrimage to the site of the capital of the Vijayanagar empire, just to see what the invasion of India led to. They will see a totally destroyed town. Religious wars are like that. People who see that might understand what the centuries of slaughter and plunder meant. War isn't a game. When you lost that kind of war, your town was destroyed, the people who built the towns were destroyed. You are left with a headless population. That's where modern India starts from. The Vijayanagar capital was destroyed in 1565. It is only now that the surrounding region has begun to revive.



A great chance has been given to India to start up again, and I feel it has started up again. The questions about whether 50 years of India since Independence have been a failure or an achievement are not the questions to ask.

In fact, I think India is developing quite marvelously, people thought — even Mr Nehru thought — that development and new institutions in a place like Bihar, for instance, would immediately lead to beauty. But it doesn't happen like that. When a country as ravaged as India, with all its layers of cruelty, begins to extend justice to people lower down, it's a very messy business. It's not beautiful, it's extremely messy. And that's what you have now, all these small politicians with small reputations and small parties. But this is part of growth, this is part of development. You must remember that these people, and the people they represent, have never had rights before. When the oppressed have the power to assert themselves, they will behave badly. It will need a couple of generations of security, and knowledge of institutions, and the knowledge that you can trust institutions — it will take at least a couple of generations before people in that situation begin to behave well.

People in India have known only tyranny. The very idea of liberty is a new idea. The rulers were tyrants. The tyrants were foreigners. And they were proud of being foreign. There's a story that anybody could run and pull a bell and the emperor would appear at his window and give justice. This is a child's idea of history — the slave's idea of the ruler's mercy. When the people at the bottom discover that they hold justice in their own hands, the earth moves a little. You have to expect these earth movements in India. It will be like this for a hundred years. But it is the only way. It's painful and messy and primitive and petty, but it's better that it should begin. It has to begin. If we were to rule people according to what we think fit, that takes us back to the past when people had no voices.

With self-awareness all else follows. People begin to make new demands on their leaders, their fellows, on themselves. They ask for more in everything. They have a higher idea of human possibilities. They are not content with what they did before or what their fathers did before. They want to move. That is marvellous. That is as it should be.

I think that within every kind of disorder now in India there is a larger positive movement. But the future will be fairly chaotic. Politics will have to be at the level of the people now. People like Nehru were colonial — style politicians. They were to a large extent created and protected by the colonial order. They did not begin with the people. Politicians now have to begin with the people. They cannot be too far above the level of the people. They are very much part of the people.

It is important that self-criticism does not stop. The mind has to work, the mind has to be active, there has to be an exercise of the mind. I think it's almost a definition of a living country that it looks at itself, analyses itself at all times. Only countries that have ceased to live can say it's all wonderful.

51. The central thrust of the passage is that
- India is gearing up for a new awakening.
  - India is going back to its past status.
  - India is yet to understand itself.
  - India's glorious past is a figment of the imagination.



been transformed from a country perpetually on the edge of starvation into a success story held up for others to emulate.

But these are competitive times when change is rapid, and to walk slowly when the rest of the world is running is almost as bad as standing still or walking backwards. Compared with large chunks of what was then the developing world — South Korea, Singapore, Malaysia, Thailand, Indonesia, China and what was till lately a separate Hong Kong — India has fared abysmally.

It began with a far better infrastructure than most of these countries had. It suffered hardly or not at all during the World War II. It had advantages like an English speaking elite, quality scientific manpower (including a Nobel laureate and others who could be ranked among the world's best) and excellent business acumen. Yet, today, when countries are ranked according to their global competitiveness, it is tiny Singapore that figures at the top. Hong Kong is an export powerhouse. So is Taiwan. If a symbol were needed of how far we have fallen back, note that while Korean Cielos are sold in India, no one in South Korea is rushing to buy an Indian car.

The reasons list themselves. Topmost is economic isolationism. The government discouraged imports and encouraged self-sufficiency. Whatever the aim was, the result was the creation of a totally inefficient industry that failed to keep pace with global trends and, therefore, became absolutely uncompetitive. Only when the trade gates were opened a little did this become apparent. The years since then have been spent in merely trying to catch up.

That the government actually sheltered its industrialists from foreign competition is a little strange. For, in all other respects, it operated under the conviction that businessmen were little more than crooks who were to be prevented from entering the most important areas of the economy, who were to be hamstrung in as many ways as possible, who were to be tolerated in the same way as an inexcisable wart. The high, expropriatory rates of taxation, the licensing laws, the reservation of whole swathes of industry for the public sector, and the granting of monopolies to the public sector firms were the principal manifestations of this attitude. The government forgot that before wealth could be distributed, it had to be created. The government forgot that it itself could not create, but only squander wealth.

Some of the manifestations of the old attitude have changed. Tax rates have fallen. Licensing has been all but abolished. And the gates of global trade have been opened wide. But most of these changes were forced by circumstances partly by the foreign exchange bankruptcy of 1991 and the recognition that the government could no longer muster the funds to support the public sector, leave alone expand it. Whether the attitude of the government itself, or that of more than a handful of ministers, has changed, is open to question.

In many other ways, however, the government has not changed one whit. Business still has to negotiate a welter of negotiations. Transparency is still a longer way off. And there is no exit policy. In defending the existing policy, politicians betray an inability to see beyond their noses. A no-exit policy for labour is equivalent to a no-entry policy for new business. If one industry is not allowed to retrench labour, other industries will think a hundred times before employing new labour.

In other ways too, the government hurts industries. Public sector monopolies like the department of telecommunications and Videsh Sanchar Nigam Ltd. make it possible for Indian businesses to operate only at a cost several times that of their counterparts abroad. The infrastructure is in shambles partly

because it is unable to formulate a sufficiently remunerative policy for private business, and partly because it does not have the stomach to change market rates for services.

After a burst of activity in the early nineties, the government is dragging its feet. At the rate it is going, it will be another 50 years before the government realises that a pro-business policy is the best pro-people policy. By then of course, the world would have moved even farther ahead.

61. The writer's attitude towards the government is  
a. critical.                      b. ironical.                      c. sarcastic.                      d. derisive.
62. The writer is surprised at the government's attitude towards its industrialists because  
a. the government did not need to protect its industrialists.  
b. the issue of competition was non-existent.  
c. the government looked upon its industrialists as crooks.  
d. the attitude was a conundrum.
63. The government was compelled to open the economy due to  
a. pressure from international markets.  
b. pressure from domestic market.  
c. foreign exchange bankruptcy and paucity of funds with the government.  
d. All of these
64. The writer ends the passage on a note of  
a. cautious optimism.      b. pessimism.                      c. optimism.                      d. pragmatism.
65. According to the writer, India should have performed better than the other Asian nations because  
a. it had adequate infrastructure.  
b. it had better infrastructure.  
c. it had better politicians who could take the required decisions.  
d. All of these
66. India was in a better condition than the other Asian nations because  
a. it did not face the ravages of the World War II.  
b. it had an English speaking populace and good business sense.  
c. it had enough wealth through its exports.  
d. Both (a) and (b)
67. The major reason for India's poor performance is  
a. economic isolationism.                      b. economic mismanagement.  
c. inefficient industry.                      d. All of these
68. One of the features of the government's protectionist policy was  
a. encouragement of imports.                      b. discouragement of exports.  
c. encouragement of exports.                      d. discouragement of imports.

69. The example of the Korean Cielo has been presented to highlight
- India's lack of stature in the international market.
  - India's poor performance in the international market.
  - India's lack of creditability in the international market.
  - India's disrepute in the international market.
70. According to the writer,
- India's politicians are myopic in their vision of the country's requirements.
  - India's politicians are busy lining their pockets.
  - India's politicians are not conversant with the needs of the present scenario.
  - All of these

### Passage – 3

When Deng Xiaoping died a few months ago, the Chinese leadership barely paused for a moment before getting on with the business of governing the country. Contrast that with the chaotic contortions on India's political stage during the past month, and it is easy to conclude that democracy and democratic freedoms are serious obstacles to economic progress.

When the Chinese leadership wants a power plant to be set up, it just goes ahead. No fears of protracted litigation, of environmental protests, or of lobbying by interested parties. It — or the economy — is not held to ransom by striking truckers or air traffic controllers. Certainly, there is much that is alluring about an enlightened dictatorship.

But there the trouble begins. First, there is no guarantee that a dictatorship will be an enlightened one. Myanmar has been ruled by a dictator for decades, and no one would claim that it is better off than even Bangladesh which has itself suffered long stretches of dictatorship. Nor can Mobutu Sese Seko, much in the news these days, be described as enlightened by any reckoning. The people of Israel, almost the only democracy in a region where dictatorships (unenlightened ones) are the norm, are much better off than their neighbours.

Second, dictatorships can easily reverse policies. China was socialist as long as Mao Zedong was around. When Deng Xiaoping took over in what was essentially a palace coup, he took the country in the opposite direction. There is little to ensure that the process will not be repeated. In India such drastic reversals are unlikely.

Six years ago Indian politicians agreed that industries should be de-licensed, that imports should be freed or that investment decisions should be based on economic considerations. Now few think otherwise. Almost all politicians are convinced of the merits of liberalisation though they may occasionally lose sight of the big picture in pandering to their constituencies. India has moved slower than China on liberalisation, but whatever moves it has made are more permanent.

Democracies are also less likely to get embroiled in destructive wars. Had Saddam Hussain been under the obligation of facing free elections every five years, he would have thought ten times before entangling his people in a long confrontation with the West. Germany, Italy and Japan were all dictatorships when they launched the World War II. The price was paid by the economies.

Democracies make many small mistakes. But dictatorships are more susceptible to making huge ones and risking everything on one decision — like going to war. Democracies are the political equivalent of free markets. Companies know they can't fool the consumer too often; he will simply switch to the competition. The same goes for political parties. When they fail to live up to their promises in government, the political consumer opts for the competition.

Democratic freedoms too are important for the economy, especially now that information is supreme. Few doubt that the Internet will play an important part in the global economy in the decades to come. But China, by preventing free access to it, is already probably destroying its capabilities in this area. As service industries grow in importance, China may well be at a disadvantage though that may not be apparent today when its manufacturing juggernaut is rolling ahead.

India has stifled its entrepreneurs through its licensing policies. That was an example of how the absence of economic freedom can harm a country. But right-wing dictatorships like South Korea erred in the opposite direction. They forced their businesses to invest in industries, which they (the dictators) felt had a golden future. Now many of those firms are trying to retreat from those investments. Statism is bad, no matter what the direction in which it applies pressure. At this moment, China and other dictatorships may be making foolish investment decisions. But as industries are subsidized and contrary voices not heard, the errors will not be realised until the investments assume gargantuan proportions.

India's hesitant ways may seem inferior to China's confident moves. But at least we know what the costs are. That is not the case with China. It was only years after the Great Leap Forward and only such experiments that the cost in human lives (millions of them) became evident to the world. What the cost of China's present experiments is we may not know for several years more. A nine per cent rate of growth repeated year after year may seem compelling. But a seven per cent rate of growth that will not falter is more desirable. India seems to be on such a growth curve, whatever the shenanigans of our politicians.

71. According to the passage,
- a. India needs a benevolent dictatorship.
  - b. India has failed as a democracy.
  - c. India should go the way of China.
  - d. None of these
72. The passage says that
- a. benevolent dictators are not easy to find.
  - b. not all dictators will be enlightened.
  - c. dictators can make or break a country.
  - d. an enlightened dictatorship is better than a corrupt democracy.
73. It can be implied from the passage that
- a. a lower rate of growth is preferred to a higher rate of growth.
  - b. a higher rate of growth is preferred to a lower rate of growth.
  - c. a low but stable rate of growth is preferred to a high rate of growth.
  - d. a low but faltering rate of growth is a sign of stability amidst growth.
74. Vis-a-vis democracies, dictatorships run the risk of
- a. losing all for a single mistake.
  - b. making bigger mistakes.
  - c. making huge mistakes and risking everything.
  - d. None of these

75. The writer's conclusion in the passage is that
- under no circumstances should a country encourage a corrupt democrat.
  - under no circumstances should statism be a welcome move.
  - a statist will not give due importance to the voice of the people.
  - a statist will always look to his own welfare.
76. Democracy has been compared to the free market, as
- both have a high degree of competition.
  - both offer a multitude of options to choose from.
  - consumer satisfaction plays an important role in both.
  - All of these
77. It can be inferred from the passage that
- China stands to lose out in the global market because it has blocked the Internet.
  - India stands to gain in the global market because of its policy vis-à-vis the Internet.
  - Internet will play a crucial role in the global market in the years to come.
  - All of these
78. According to the passage, a democratic set up works as a check on the
- actions and decisions of its leaders.
  - functioning of its economy.
  - Both (a) and (b)
  - None of these
79. India's moves on liberalisation are more permanent than China's because
- India's politicians are in agreement over the need for reforms.
  - India is not at the mercy of dictators.
  - unlike China, India is unlikely to have drastic policy reversals.
  - India is not in a hurry to reform
80. According to the passage,
- Israel is the only democracy in West Asia.
  - Israel is better off than Bangladesh or Myanmar.
  - Israel does not face policy reversals.
  - None of these

### Passage – 4

Of each of the great leaders, it is said by his followers, long after he is gone, he made us do it. If leadership is the art of persuading your people to follow your bidding, without their realising your involvement, the archetype of its practice is N. R. Narayana Murthy, the chairman and managing director of the Rs. 143.81 crore Infosys Technologies (Infosys). For, the 52-year-old CEO of the globalised software corporation — which he founded with six friends, and a combined capital of Rs. 10,000 in 1981 and which now occupies the front ranks of the country's most admired corporations, leads with the subtlest of weapons: personal example.

Infosys ranks only 578th among the country's listed companies, and sixth in the software sector, in terms of its turnover. But it is setting new standards for India Inc. through its practices of inter alia awarding stock

options to its employees, putting the value of its intellectual assets and its brands on its balance sheet, and conforming to the disclosure standards of the Securities and Exchange Commission (SEC) of the US. Behind all this is the stubborn personal subscription of its CEO to the underlying causes of wealth-creation-people-power and transparency. "What were choices earlier are compulsions now," asserts Murthy.

In fact, the mirror images of Murthy, the Man, can be found all over Infosys, his company. His egalitarianism — which finds expression in such habits as using the same table and chair as anyone else in the organisation — is practised firmly when it comes to charting a course for the company's future: everyone has a voice. "We have no hierarchy just for the sake of control."

Brimming with the conviction that customer satisfaction is the key to success, Murthy has built a fleet-footed human resource management system that treats employees as customers, using the resources of the organisation to meet their professional and personal needs. His instruments are not just top-of-the-market salaries, but also operational empowerment as well as every facility that an employee needs to focus on the job.

Just what methods does Murthy use to ensure that his DNA is replicated in his company? Not for him are the classical leadership genre — transactional or transformational, situational or visionary. His chosen style, instead, is to lead by example, ensuring that the CEO's actions set the template for all Infosysians.

Murthy believes that the betterment of man can be brought about through the 'creation of wealth, legally and ethically'. The personal example that he has set enabled his company to mirror those beliefs, tying his own rewards, and measuring his value to the company, to his ability to create wealth, and erecting systems for the company's wealth to be shared by its people. Sums up Nandan Nilekani, 41, deputy managing director, Infosys: "This is the future model of the corporation. Run an excellent company, and let the market increase its value to create wealth."

Although Murthy is one of the prime beneficiaries of the philosophy — his 10 per cent stake in Infosys is worth Rs. 130 crore today — in his book, the leader leads not by grabbing the booty but by teaching others to take what they deserve. That's why, on the Infosys' balance sheet, the value of Murthy's intellectual capital is nowhere near the top, on the rationale, that the CEO, at 52, is worth far less to his company than, say, a bright young programmer of 26. To spread the company's wealth, Murthy has instituted stock options — the first to do so in the country — for employees, creating 300 millionaires already. By 2000, he wants the number to climb to 1000.

To act as a beacon for his version of the learning organisation, Murthy not only spends an hour a day surfing the Internet to learn about new technological developments in his field, he also makes as many luncheon appointments as he can with technical people and academicians — dons from the Indian Institutes of Technology for instance — systematically plumbing their depths for an understanding of new developments in infotech. Murthy's objective is not just to stay abreast of the state-of-the-art, but also to find a way to use that knowledge for the company.

Following Murthy's example, Infosys has set up a technology advancement unit, whose mandate is to track, evaluate, and assimilate new techniques and methodologies. In fact, Murthy views learning not just as amassing data, but as a process that enables him to use the lessons from failure to achieve success. This self-corrective loop is what he demonstrates through his leadership during a crisis.



In 1995, for example, Infosys lost a Rs. 15 crore account — then 20 per cent of its revenues — when the \$69 billion GE yanked its business from it. Instead of recriminations, Murthy activated Infosys' machinery to understand why the business was taken away and to leverage the learning for getting new clients instead. Feeling determined instead of guilty, his employees went on to sign up high profile customers like the \$20 billion Xerox, the \$7 billion Levi Strauss, and the \$14 billion Nynex.

"You must have a multi-dimensional view of paradigms," says the multi-tasking leader. The objective is obvious: ensure that Infosys' perspective on its business and the world comes from as many vantage points as possible so that corporate strategy can be synthesised not from a narrow vision, but from a wide angle lens. In fact, Murthy still regrets that, in its initial years, Infosys didn't distil a multi-pronged understanding of the environment into its strategies, which forced it onto an incremental path that led revenues to snake up from Rs. 0.02 crore to just Rs. 5 crore in the first 10 years.

It was after looking around itself instead of focusing on its initial business of banking software, that Infosys managed to accelerate. Today the company operates with stretch targets setting distant goals and working backwards to get to them. The crucial pillar on which Murthy bases his ethical leadership is openness. Transparency, he reckons, is the clearest signal that one has nothing to hide. The personal manifestations of that are inter alia the practice of always giving complete information whenever any employee, customer, or investor asks for it: the loudly proclaimed insistence that every Infoscion pay taxes and file returns: and a perpetually open office into which anyone can walk.

But even as he tries to lead Infosys into cloning his own approach to enterprise, is Murthy choosing the best future for it? If Infosys grows with the same lack of ambition, the same softness of style, and the same absence of aggression, is it not cutting off avenues of growth that others may seize? As Infosys approaches the 21st century it is obvious that Murthy's leadership will have to set ever-improving role models for his ever-learning company. After all, men grow old; companies shouldn't.

81. One of the ways in which Infosys spreads the company's wealth among its employees is
  - a. by awarding stock options.
  - b. by giving an extravagant bonus at the end of each year.
  - c. Both (a) and (b)
  - d. None of these
  
82. According to the passage, at Infosys
  - a. control is exerted through a system of hierarchy.
  - b. control is not exerted through a system of hierarchy.
  - c. hierarchy does not have pride of place.
  - d. popular opinion is the most respected voice.
  
83. Murthy believes in
  - a. betterment of man through learning.
  - b. betterment of man through ethical creation of wealth.
  - c. betterment of man through experimentation.
  - d. All of these

84. The example of the Rs. 15 crore account highlights
- Murthy's ability to see his company through a crisis.
  - Murthy's ability to turn failure into success.
  - Murthy's potential to handle a crisis.
  - All of these
85. According to Murthy, learning is
- the essence of a employee.
  - the art of amassing data.
  - a process that helps him to learn from failure.
  - All of these
86. According to the passage,
- Infosys could not have succeeded without working backward.
  - Infosys succeeded because it worked backwards.
  - working backwards contributed to Infosys' success.
  - working backwards is a hallmark of Infosys' functioning today.
87. Openness at Infosys includes
- the payment of taxes.
  - giving complete information.
  - sharing secrets.
  - Both (a) and (b)
88. It is evident from the passage that
- Infosys will have to devise new strategies to meet the challenges of the 21st century.
  - Infosys will stagnate if it does not become aggressive.
  - Infosys may have to become more aggressive in order to retain its market.
  - None of these
89. The cornerstone of Murthy's human resource management system is
- the employee as God.
  - optimum utilization of human potential.
  - customer satisfaction.
  - satisfaction of personal needs.
90. According to the passage,
- Infosys is a reflection of its CEO.
  - Infosys brings the best out in Murthy.
  - Infosys and Murthy are synonymous.
  - Murthy, the man, and Murthy the CEO are incompatible.

### Passage – 5

Last fortnight, news of a significant development was tucked away in the inside pages of newspapers. The government finally tabled a bill in Parliament seeking to make primary education a fundamental right. A fortnight earlier, a Delhi-based newspaper had carried a report about a three-month interruption in the Delhi Government's 'Education for All' programme. The report made for distressing reading. It said that literacy centres across the city were closed down, volunteers beaten up and enrolment registers burnt. All because the state government had, earlier this year, made participation in the programme mandatory for teachers in government schools. The routine denials were issued and there probably was a wee bit of exaggeration in the report. But it still is a pointer to the enormity of the task at hand.

That economic development will be inherently unstable unless it is built on a solid base of education, specially primary education, has been said so often that it is in danger of becoming a platitude. Nor does India's abysmal record in the field need much reiteration. Nearly 30 million children in the six to ten age group do not go to school — reason enough to make primary education not only compulsory but a fundamental right. But is that the solution? More importantly, will it work? Or will it remain a mere token, like the laws providing for compulsory primary education? It is now widely known that 14 states and four Union Territories have this law on their statute books. Believe it or not, the list actually includes Bihar, Madhya Pradesh (MP) and Rajasthan, where literacy and education levels are miles below the national average. A number of states have not even notified the compulsory education law.

This is not to belittle the decision to make education a fundamental right. As a statement of political will, a commitment by the decision-makers, its importance cannot be undervalued. Once this commitment is clear, a lot of other things like resource allocation will naturally fall into place. But the task of universalizing elementary education (UEE) is complicated by various socio-economic and cultural factors which vary from region to region and within regions.

If India's record continues to appall, it is because these intricacies have not been adequately understood by the planners and administrators. The trouble has been that education policy has been designed by grizzled mandarins ensconced in Delhi and is totally out of touch with the ground reality. The key then is to decentralise education planning and implementation. What's also needed is greater community involvement in the whole process. Only then can school timings be adjusted for convenience, school children given a curriculum they can relate to and teachers made accountable.

For proof, one has only to look at the success of the district primary education programme, which was launched in 1994. It has met with a fair degree of success in the 122 districts it covers. Here the village community is involved in all aspects of education — allocating finances to supervising teachers to fixing school timings and developing curriculum and textbooks — through district planning teams. Teachers are also involved in the planning and implementation process and are given small grants to develop teaching and learning material, vastly improving motivational levels. The consequent improvement in the quality of education generates increased demand for education.

But for this demand to be generated, quality will first have to be improved. In MP, the village panchayats are responsible for not only constructing and maintaining primary schools but also managing scholarships, besides organising non-formal education. How well this works in practice remains to be seen (though the department claims the schemes are working very well) but the decision to empower panchayats with such powers is itself a significant development. Unfortunately, the Panchayat Raj Act has not been notified in many states. After all, delegating powers to the panchayats is not looked upon too kindly by vested interests. More specifically, by politicians, since decentralisation of education administration takes away from them the power of transfer, which they use to grant favours and build up a support base. But if the political leadership can push through the bill to make education a fundamental right, it should also be able to persuade the states to implement the laws on Panchayat Raj. For, UEE cannot be achieved without decentralisation. Of course, this will have to be accompanied by proper supervision and adequate training of those involved in the administration of education. But the devolution of powers to the local bodies has to come first.

91. One of the problems plaguing the education system in India is  
a. poverty. b. diverse cultural and socio-economic factors.  
c. male chauvinism. d. All of these
92. In the context of the passage, the term 'grizzled mandarins' means  
a. old hags. b. decrepit men. c. ineffective old men. d. None of these
93. One of the reasons contributing to India's poor performance on the education front is that  
a. its leaders do not have the conviction required to improve the education system.  
b. male members of society do not want their female counterparts to be educated.  
c. administrators in charge of education are out of touch with ground realities.  
d. the country does not have the law for implementation of education policies in its statute books.
94. The only way in which the education system can be improved is by  
a. decentralising education planning and implementation.  
b. introducing fresh blood in the planning body.  
c. injecting funds into the exchequer solely for the purpose.  
d. educating the people on the need for primary education.
95. Very low education levels are visible in  
a. Bihar, Rajasthan and Uttar Pradesh.  
b. Rajasthan, West Bengal and Madhya Pradesh.  
c. Rajasthan, Bihar and Madhya Pradesh.  
d. West Bengal, Uttar Pradesh and Bihar.
96. The district primary education programme  
a. was launched in 1994 in 22 states.  
b. was launched in 1994 in 12 states.  
c. launched in 1994 has been successful in 122 districts.  
d. launched in 1994 has met with dubious success.
97. The village panchayats in Madhya Pradesh are responsible for  
a. implementing adult education policies for the villages.  
b. organising non-formal education.  
c. scholarships and construction and maintenance of primary schools.  
d. Both (b) and (c)
98. The successful implementation of education policies is obstructed by  
a. vested interests. b. panchayat officials. c. politicians. d. bureaucrats.
99. Primary education  
a. is a fundamental right. b. will be made a fundamental right.  
c. is only for the privileged sections of society. d. None of these
100. One of the ways in which education policy can be successfully implemented as mentioned in the passage, is  
a. greater community involvement. b. greater community development.  
c. greater community awareness. d. Both (a) and (b)

## Section – III

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**Direction for questions 101 to 103:** Answer the questions based on the following information.

A certain race is made up of three stretches: A, B and C, each 2 km long, and to be covered by a certain mode of transport. The following table gives these modes of transport for the stretches, and the minimum and maximum possible speeds (in km/hr) over these stretches. The speed over a particular stretch is assumed to be constant. The previous record for the race is 10 min.

		Min.	Max.
A	Car	40	60
B	Motorcycle	30	50
C	Bicycle	10	20

101. Anshuman travels at minimum speed by car over A and completes stretch B at the fastest speed. At what speed should he cover stretch C in order to break the previous record?
- Maximum speed for C
  - Minimum speed for C
  - This is not possible
  - None of these
102. Mr Hare completes the first stretch at the minimum speed and takes the same time for stretch B. He takes 50% more time than the previous record to complete the race. What is Mr Hare's speed for the stretch C?
- 10.9 km/hr
  - 13.3 km/hr
  - 17.1 km/hr
  - None of these
103. Mr Tortoise completes the race at an average speed of 20 km/hr. His average speed for the first two stretches is four times that for the last stretch. Find the speed over stretch C.
- 15 km/hr
  - 12 km/hr
  - 10 km/hr
  - This is not possible

**Direction for questions 104 to 106:** Answer the questions based on the following information.

There are 60 students in a class. These students are divided into three groups A, B and C of 15, 20 and 25 students each. The groups A and C are combined to form group D.

104. What is the average weight of the students in group D?
- More than the average weight of A
  - More than the average weight of C
  - Less than the average weight of C
  - Cannot be determined
105. If one student from group A is shifted to group B, which of the following will be true?
- The average weight of both groups increases
  - The average weight of both the groups decreases
  - The average weight of the class remains the same
  - Cannot be determined
106. If all the students of the class have the same weight, then which of the following is false?
- The average weight of all the four groups is the same
  - The total weight of A and C is twice the total weight of B
  - The average weight of D is greater than the average weight of A
  - The average weight of all the groups remains the same even if a number of students are shifted from one group to another

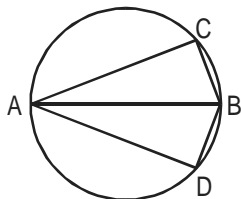


118. If the roots  $x_1$  and  $x_2$  of the quadratic equation  $x^2 - 2x + c = 0$  also satisfy the equation  $7x_2 - 4x_1 = 47$ , then which of the following is true?  
 a.  $c = -15$                       b.  $x_1 = -5, x_2 = 3$                       c.  $x_1 = 4.5, x_2 = -2.5$                       d. None of these
119. The sum of the areas of two circles, which touch each other externally, is  $153\pi$ . If the sum of their radii is 15, find the ratio of the larger to the smaller radius.  
 a. 4                                      b. 2                                      c. 3                                      d. None of these
120. If  $m$  and  $n$  are integers divisible by 5, which of the following is not necessarily true?  
 a.  $m - n$  is divisible by 5                                      b.  $m^2 - n^2$  is divisible by 25  
 c.  $m + n$  is divisible by 10                                      d. None of these
121. Which of the following is true?  
 a.  $7^{3^2} = (7^3)^2$                       b.  $7^{3^2} > (7^3)^2$                       c.  $7^{3^2} < (7^3)^2$                       d. None of these

**Direction for questions 122 to 124:** Answer the questions based on the following information.  
 A survey of 200 people in a community who watched at least one of the three channels — BBC, CNN and DD — showed that 80% of the people watched DD, 22% watched BBC, and 15% watched CNN.

122. What is the maximum percentage of people who can watch all the three channels?  
 a. 12.5%                                      b. 8.5%                                      c. 15%                                      d. Data insufficient
123. If 5% of people watched DD and CNN, 10% watched DD and BBC, then what percentage of people watched BBC and CNN only?  
 a. 2%                                      b. 5%                                      c. 8.5%                                      d. Cannot be determined
124. Referring to the previous question, what percentage of people watched all the three channels?  
 a. 3.5%                                      b. 0%                                      c. 8.5%                                      d. Cannot be determined
125. A man earns  $x\%$  on the first Rs. 2,000 and  $y\%$  on the rest of his income. If he earns Rs. 700 from income of Rs. 4,000 and Rs. 900 from if his income is Rs. 5,000, find  $x\%$ .  
 a. 20%                                      b. 15%                                      c. 25%                                      d. None of these

126.



AB is the diameter of the given circle, while points C and D lie on the circumference as shown. If AB is 15 cm, AC is 12 cm and BD is 9 cm, find the area of the quadrilateral ACBD.

- a.  $54\pi$  sq. cm                                      b.  $216\pi$  sq. cm  
 c.  $162\pi$  sq. cm                                      d. None of these

127. P, Q and R are three consecutive odd numbers in ascending order. If the value of three times P is 3 less than two times R, find the value of R.
- a. 5                                      b. 7                                      c. 9                                      d. 11

**Direction for questions 128 to 130:** Answer the questions based on the following information.

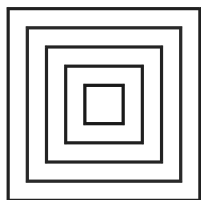
For these questions the following functions have been defined.

$$la(x, y, z) = \min(x + y, y + z)$$

$$le(x, y, z) = \max(x - y, y - z)$$

$$ma(x, y, z) = \frac{1}{2} [le(x, y, z) + la(x, y, z)]$$

128. Given that  $x > y > z > 0$ . Which of the following is necessarily true?
- a.  $la(x, y, z) < le(x, y, z)$                                       b.  $ma(x, y, z) < la(x, y, z)$   
c.  $ma(x, y, z) < le(x, y, z)$                                       d. None of these
129. What is the value of  $ma(10, 4, le(la(10, 5, 3), 5, 3))$ ?
- a. 7                                      b. 6.5                                      c. 8                                      d. 7.5
130. For  $x = 15, y = 10$  and  $z = 9$ , find the value of  $le(x, \min(y, x - z), le(9, 8, ma(x, y, z)))$ .
- a. 5                                      b. 12                                      c. 9                                      d. 4
131. ABC is a three-digit number in which  $A > 0$ . The value of ABC is equal to the sum of the factorials of its three digits. What is the value of B?
- a. 9                                      b. 7                                      c. 4                                      d. 2
132. The adjoining figure shows a set of concentric squares. If the diagonal of the innermost square is 2 units, and if the distance between the corresponding corners of any two successive squares is 1 unit, find the difference between the areas of the eighth and the seventh squares, counting from the innermost square.



- a.  $10\sqrt{2}$  sq. units                      b. 30 sq. units                      c.  $35\sqrt{2}$  sq. units                      d. None of these
133. A, B and C are defined as follows.

$$A = (2.000004) \div \left[ (2.000004)^2 + (4.000008) \right]$$



$$B = (3.000003) \div \left[ (3.000003)^2 + (9.000009) \right]$$

$$C = (4.000002) \div \left[ (4.000002)^2 + (8.000004) \right]$$

Which of the following is true about the values of the above three expressions?

- a. All of them lie between 0.18 and 0.2                      b. A is twice of C  
c. C is the smallest    d. B is the smallest
134. The value of each of a set of coins varies as the square of its diameter, if its thickness remains constant, and it varies as the thickness, if the diameter remains constant. If the diameter of two coins are in the ratio 4 : 3, what should be the ratio of their thickness' be if the value of the first is four times that of the second?  
a. 16 : 9                      b. 9 : 4                      c. 9 : 16                      d. 4 : 9
135. In  $\triangle ABC$ , points P, Q and R are the mid-points of sides AB, BC and CA respectively. If area of  $\triangle ABC$  is 20 sq. units, find the area of  $\triangle PQR$ .  
a. 10 sq. units                      b.  $5\sqrt{3}$  sq. units                      c. 5 sq. units                      d. None of these
136. In a rectangle, the difference between the sum of the adjacent sides and the diagonal is half the length of the longer side. What is the ratio of the shorter to the longer side?  
a.  $\sqrt{3} : 2$                       b.  $1 : \sqrt{3}$                       c. 2 : 5                      d. 3 : 4

**Direction for questions 137 and 138:** Answer the questions based on the following information.

The Weirdo Holiday Resort follows a particular system of holidays for its employees. People are given holidays on the days where the first letter of the day of the week is the same as the first letter of their names. All employees work at the same rate.

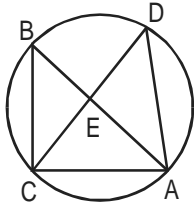
137. Raja starts working on February 25, 1996, and finishes the job on March 2, 1996. How much time would T and J take to finish the same job if both start on the same day as Raja?  
a. 4 days                      b. 5 days                      c. Either (a) or (b)                      d. Cannot be determined
138. Starting on February 25, 1996, if Raja had finished his job on April 2, 1996, when would T and S together likely to have completed the job, had they started on the same day as Raja?  
a. March 15, 1996                      b. March 14, 1996                      c. March 22, 1996                      d. Data insufficient

**Direction for questions 139 to 141:** Answer the questions based on the following information.

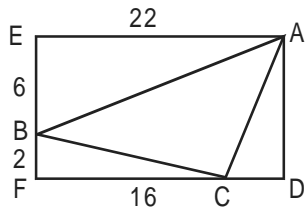
Boston is 4 hr ahead of Frankfurt and 2 hr behind India. X leaves Frankfurt at 6 p.m. on Friday and reaches Boston the next day. After waiting there for 2 hr, he leaves exactly at noon and reaches India at 1 a.m. On his return journey, he takes the same route as before, but halts at Boston for 1hr less than his previous halt there. He then proceeds to Frankfurt.

139. If his journey, including stoppage, is covered at an average speed of 180 mph, what is the distance between Frankfurt and India?  
a. 3,600 miles                      b. 4,500 miles                      c. 5,580 miles                      d. Data insufficient

140. If X had started the return journey from India at 2.55 a.m. on the same day that he reached there, after how much time would he reach Frankfurt?
- a. 24 hr                      b. 25 hr                      c. 26 hr                      d. Data insufficient
141. What is X's average speed for the entire journey (to and fro)?
- a. 176 mph                      b. 180 mph                      c. 165 mph                      d. Data insufficient
142. In the adjoining figure, points A, B, C and D lie on the circle.  $AD = 24$  and  $BC = 12$ . What is the ratio of the area of  $\triangle CBE$  to that of  $\triangle ADE$ ?



- a. 1 : 4                      b. 1 : 2                      c. 1 : 3                      d. Data insufficient
143. In the given figure, EADF is a rectangle and ABC is a triangle whose vertices lie on the sides of EADF and  $AE = 22$ ,  $BE = 6$ ,  $CF = 16$  and  $BF = 2$ . Find the length of the line joining the mid-points of the sides AB and BC.



- a.  $4\sqrt{2}$                       b. 5                      c. 3.5                      d. None of these

**Direction for questions 144 and 145:** Answer the questions based on the following information.

A thief, after committing the burglary, started fleeing at 12 noon, at a speed of 60 km/hr. He was then chased by a policeman X. X started the chase, 15 min after the thief had started, at a speed of 65 km/hr.

144. At what time did X catch the thief?
- a. 3.30 p.m.                      b. 3 p.m.                      c. 3.15 p.m.                      d. None of these
145. If another policeman had started the same chase along with X, but at a speed of 60 km/hr, then how far behind was he when X caught the thief?
- a. 18.75 km                      b. 15 km                      c. 21 km                      d. 37.5 km

**Direction for questionos 146 to 155:** Each of these items has a question followed by two statements, I and II. Mark the answer

- a. if the question can be answered with the help of one statement alone.  
 b. if the question can be answered with the help of any one statement independently.  
 c. if the question can be answered with the help of both statements together.  
 d. if the question cannot be answered even with the help of both statements together.

146. What is the value of  $a^3 + b^3$  ?
- $a^2 + b^2 = 22$
  - $ab = 3$
147. Is the number completely divisible by 99?
- The number is divisible by 9 and 11 simultaneously.
  - If the digits of the number are reversed, the number is divisible by 9 and 11.
148. A person is walking from Mali to Pali, which lies to its north-east. What is the distance between Mali and Pali?
- When the person has covered  $\frac{1}{3}$  the distance, he is 3 km east and 1 km north of Mali.
  - When the person has covered  $\frac{2}{3}$  the distance, he is 6 km east and 2 km north of Mali.
149. What is the value of x and y?
- $3x + 2y = 45$
  - $10.5x + 7y = 157.5$
150. Three friends P, Q and R are wearing hats, either black or white. Each person can see the hats of the other two persons. What is the colour of P's hat?
- P says that he can see one black hat and one white hat.
  - Q says that he can see one white hat and one black hat.
151. What is the speed of the car?
- The speed of a car is 10 (km/hr) more than that of a motorcycle.
  - The motorcycle takes 2 hr more than the car to cover 100 km.
152. What is the ratio of the volume of the given right circular cone to the one obtained from it?
- The smaller cone is obtained by passing a plane parallel to the base and dividing the original height in the ratio 1 : 2.
  - The height and the base of the new cone are one-third those of the original cone.
153. What is the area bounded by the two lines and the coordinate axes in the first quadrant?
- The lines intersect at a point which also lies on the lines  $3x - 4y = 1$  and  $7x - 8y = 5$ .
  - The lines are perpendicular, and one of them intersects the Y-axis at an intercept of 4.
154. What is the cost price of the chair?
- The chair and the table are sold at profits of 15% and 20% respectively.
  - If the cost price of the chair is increased by 10% and that of the table is increased by 20%, the profit reduces by Rs. 20.
155. After what time will the two persons Tez and Gati meet while moving around the circular track? Both of them start at the same point and at the same time.
- Tez moves at a constant speed of 5 m/s, while Gati starts at a speed of 2 m/s and increases his speed by 0.5 m/s at the end of every second thereafter.
  - Gati can complete one entire lap in exactly 10 s.

## Section – IV

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**Direction for questions 156 to 160:** Answer the questions based on the following table.

### Hotels in Mumbai

Project	No. of rooms	Cost (Rs. in crores)	Year of completion	Company
Windsor Manor	600	275	1999	IHCL
Leela Hotels	310	235	1999	Leela Hotels
Mumbai Heights	250	250	1998	Bombay Hotels
Royal Holidays	536	225	1998	Lokhandwala Group
Majestic Holiday	500	250	1999	Raheja Group
Supremo Hotel	300	300	1999	ITC
Hyatt Regency	500	250	2000	Asian Hotels

**Note:** All projects start in 1997.

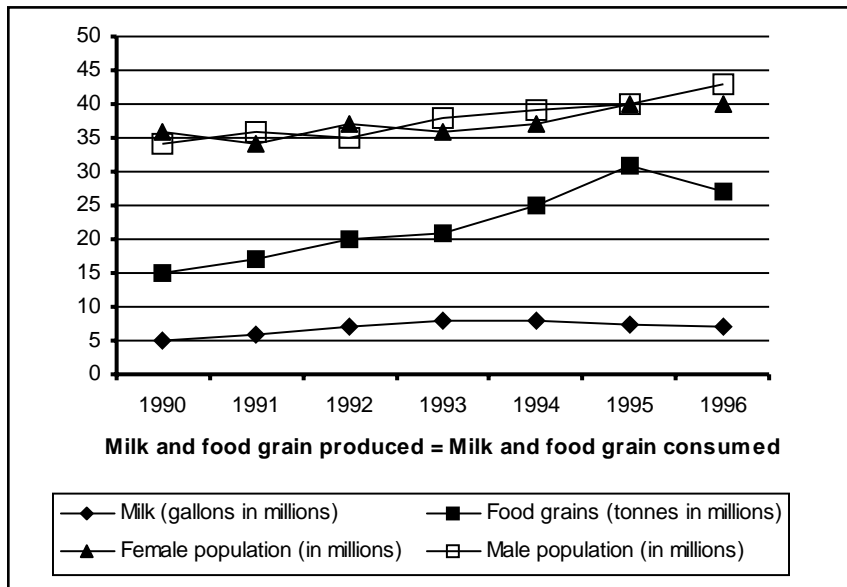
156. Which of the following had the least cost per room?  
a. Lokhandwala Group    b. Raheja Group    c. IHCL    d. ITC
157. Which of the following has the maximum number of rooms per crore of rupees?  
a. IHCL    b. Raheja Group    c. Lokhandwala Group    d. ITC

**Additional direction for questions 158 to 160:** Assume that the cost of the project is incurred in the year of completion; interest is charged at the rate of 10% per annum.

158. What is the cost incurred for projects completed in 1998?  
a. Rs. 475 crore    b. Rs. 500 crore    c. Rs. 522.5 crore    d. Rs. 502.5 crore
159. What is the cost incurred for projects completed in 1999?  
a. Rs. 1,282.6 crore    b. Rs. 1,270 crore    c. Rs. 1,805.1 crore    d. Rs. 1,535 crore
160. What is the approximate cost incurred for projects completed by 2000?  
a. Rs. 1,785    b. Rs. 2,140    c. Rs. 2,320    d. None of these

**Direction for questions 161 to 166:** Answer the questions based on the following graph.

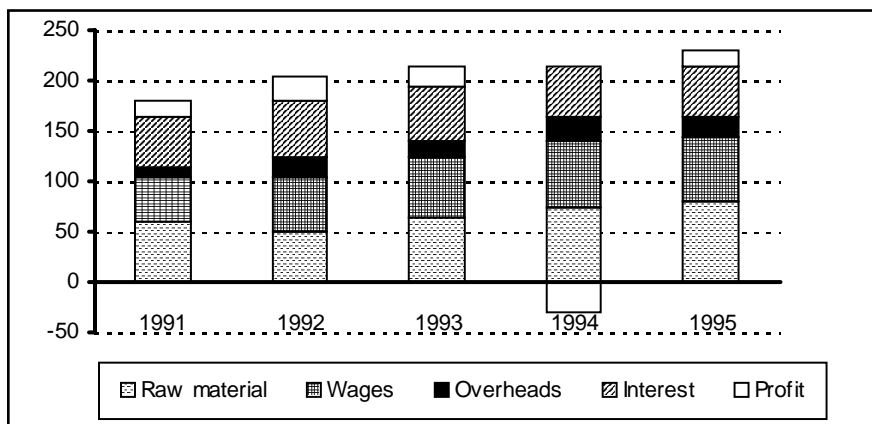
The graph given below shows the quantity of milk and food grains consumed annually along with female and male population (in millions). Use the data to answer the questions that follow.



161. When was the per capita production of milk least?
  - a. 1990
  - b. 1992
  - c. 1994
  - d. 1996
162. When was the per capita production of foodgrains most?
  - a. 1992
  - b. 1993
  - c. 1994
  - d. 1995
163. In which year was the difference between the percentage increase in the production of foodgrains and milk maximum?
  - a. 1993
  - b. 1994
  - c. 1995
  - d. 1996
164. If milk contains 320 calories and foodgrains contain 160 calories, in which year was the per capita consumption of calories highest?
  - a. 1993
  - b. 1994
  - c. 1995
  - d. 1996
165. If one gallon milk contains 120 g of a particular nutrient and one tonne of foodgrains contains 80 g of the same nutrient, in which year was the availability of this nutrient maximum?
  - a. 1993
  - b. 1994
  - c. 1995
  - d. 1996
166. Referring to the above question, in which year was the per capita consumption of this nutrient highest?
  - a. 1993
  - b. 1994
  - c. 1995
  - d. 1996

**Direction for questions 167 to 172:** Answer the questions based on the following graph.

The graph given below gives the yearly details of money invested in producing a certain product over the years 1991 to 1995. It also gives the profit (in '000 rupees).



167. In which year was the increase in raw material maximum?  
 a. 1992                      b. 1993                      c. 1994                      d. 1995
168. In which period was the change in profit maximum?  
 a. 1991-92                      b. 1992-93                      c. 1993-94                      d. 1994-95
169. Which component of the cost production has remained more or less constant over the period?  
 a. Interest                      b. Overheads                      c. Wages                      d. Raw material
170. In which year were the overheads, as a percentage of the raw material, maximum?  
 a. 1995                      b. 1994                      c. 1992                      d. 1993
171. What percentage of the costs did the profits form over the period?  
 a. 3%                      b. 5%                      c. 8%                      d. 11%
172. If the interest component is not included in the total cost calculation, which year would show the maximum profit per unit cost?  
 a. 1991                      b. 1992                      c. 1993                      d. 1995

**Direction for questions 173 to 177:** Answer the questions based on the following information.

The following table gives the tariff [in paise per kilo-watt-hour (kWh)] levied by the UPSEB in 1994-95, in four sectors and the regions within them. The table also gives the percentage change in the tariff as compared to 1991-92.

	Region 1		Region 2		Region 3		Region 4		Region 5	
	P/kWh	%	P/kWh	%incr.	P/kWh	%incr.	P/kWh	%incr.	P/kWh	%incr.
<b>Sector 1</b>	425	+15	472	+5	420	-4	415	+8	440	+10
<b>Sector 2</b>	430	+12	468	+8	448	+7	423	-3	427	+11
<b>Sector 3</b>	428	+8	478	-4	432	+6	441	+10	439	+8
<b>Sector 4</b>	434	-5	470	+15	456	+10	451	+12	446	-12



179. From the given data, the number of rural loans up to 1980 formed approximately what percentage of those in 1983?  
a. 112%                      b. 80%                      c. 97%                      d. Cannot be determined
180. Which of the following pairs of years showed the maximum increase in the number of rural bank loans?  
a. 1971-72                      b. 1974-75                      c. 1970-71                      d. 1980-81
181. What is the value of the agricultural loans in 1983 at 1970 prices?  
a. Rs. 326                      b. Rs. 264                      c. Rs. 305                      d. None of these
182. In which year was the number of rural bank loans per rural bank least?  
a. 1974                      b. 1971                      c. 1970                      d. 1975
183. What is the simple annual rate of increase in the number of agricultural loans from 1970 to 1983?  
a. 132%                      b. 81%                      c. 75%                      d. 1056%

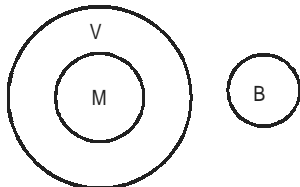
**Additional direction for questions 184 and 185:** If the consumer price index for 1970 is to be taken as 105 and the indices for the subsequent years are to be corrected accordingly, then answer 184 and 185.

184. By roughly how many points do the indices for 1983 and 1975 differ?  
a. 174                      b. 180                      c. 188                      d. 195
185. What is the value of the loans in 1980 at 1983 prices?  
a. Rs. 570 million                      b. Rs. 680 million                      c. Rs. 525 million                      d. Rs. 440 million

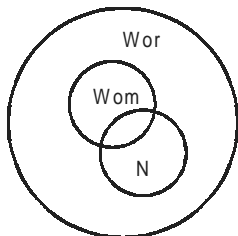




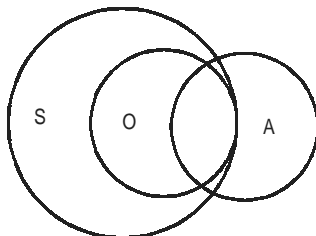
1. (c) is a pair of homophones. (a), (b) and (d) do not have pairs of homophones.
2. Doggerel is a badly written verse, which is written by a poet. Pulp fiction is a badly written piece of fiction, written by a novelist. (a), (b) and (c) do not show this derogatory relationship.
3. A premise is evidence which leads to a conclusion. An assumption does not lead to an inference. An assumption, if wrong, will weaken an inference. But a hypothesis does lead to a theory. A hypothesis is a suggested explanation for a group of facts or phenomena that is accepted as likely to be true.
4. A barge is a kind of a vessel, and a shovel is a kind of an implement. (b), (d) and (e) do not show this item to categorise relationship.
5. The second word in the pair is a higher degree of the first. (a), (b) and (c) do not display such a relationship.
6. The second word belongs to the family in the first word. (a), (b) and (c) do not display such a relationship.



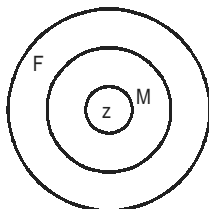
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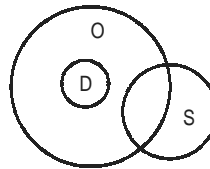
9.



10.



11.



12. Sam is not drunk, so he must be ill. One of the either ... or condition is true.
13. As Ram did not lose sleep, it shows that he did not hear of the tragedy. When A, then B. Not B, hence not A.
14. The train is not late, so it must have derailed. One of the either ... or condition is true.
15. I did not have a nightmare, so I must not have read a horror story. When A, then B. Not B, hence not A.
16. I did not get rashes which shows that I did not eat berries. When A, then B. Not B, hence not A.
17. The sentence is incomplete as 'will do' does not have an object. It should therefore be followed by 'so'. (a) is not correct as 'government' is repeated. 'policy' is undefined in (b) and (c).
18. We let go 'of' something, but we turn 'off' the lights. The proposals in (b) and (d) might go beyond the scope of the sentence.
19. The correct idiomatic usage to refer to a proliferation of something is 'have mushroomed'. 'blooming' and 'blossoming' are not words that we use to indicate that a lot of schools have come up overnight. 'Mushrooming' is most apt, literally and figuratively, in this regard. 'all over' is a more generic term than 'in every corner'; the latter term is more specific.
20. The phrase used is grammatically correct. There is a huge difference between 'important' and 'fact'. (d) similarly overlooks the serious tone of the sentence. (c) sounds verbose.
21. We take 'note' of an important clause. There is nothing to 'notice' in the sentence, so (a) and (d) are ruled out. (c) sounds awkward when read along with the rest of the sentence.
22. An act of vengeance relates to the 'beginning' of the misdeeds, and thus reopens the first chapter. Look for a suitable complement in sentences split with a semicolon. When there is a semicolon in the sentence, one has to look for a logical complement — 'closes : reopens'.
23. The correct idiomatic usage is 'as far as' something can go. (b) and (d) sound extremely confusing as they add parameters. (c) sounds needlessly verbose.

24. One sets out to achieve something. 'thought of' is not right as it should be followed by 'achieving'. 'thought to' does not sound as active as the author might wish it to be. 'went to' sounds similarly vague.
25. One does 'tough talking'. 'talk tough' is a general idiomatic expression. 'has done some' should be followed by an -ing form of the verb, such as 'investigating' or 'probing'.
26. 'Year by year' is the correct idiomatic usage here. 'annually' and 'progressively' are not the right words to use as we are just making a general observation, not dealing with statistics. The singular stress on 'each' is unwarranted in this sentence.
27. 'Amendments' is a countable noun and so 'many' should be used as a quantifier for it. (c) and (d) tamper with the pronouncement in the sentence by using weak quantifiers.
28. 'More crucial than ever' shows that though they were important earlier too, now they are even more important. (a) matches the verbal tense in the sentence 'more crucial than (they have) ever (been)'.
29. 'Break down' is the correct idiomatic use here. 'barriers' are not 'crumbled' or 'dismantled'. We can 'break' a record. For an erect barrier, the appropriate verb would be 'break down'.
30. C gives some examples to support 1. B introduces the era of computers as another example, A talks about the increasing technical terms, D introduces the idea of slangs, which is continued in 6.
31. 6 speaks of a study of IIT undergraduates' mindset. C speaks of culture developed by IIT students. Therefore, C6 is mandatory. D speaks of success stories of IIT graduates and therefore follows A.
32. A talks about the taste of the Maharaja of Kapurthala, B introduces another Maharaja with an exquisite taste, D introduces something in contrast to this, C continues with the idea which is exemplified in 6.
33. A shows how 'his' gifts were unveiled, B states the effect it had on McLaughlin, D states his reaction to the same and C states the ultimate outcome.
34. C states why India is on the brink of a major public health disaster, A states what happens if TB is untreated for 5 years, D presents some statistics to highlight the point, B states how the disease spreads and 6 continues with the fact.
35. B introduces atypical pneumonia as the subject of the passage, D states that it appears like an ordinary flu, A states its symptoms and C states how these symptoms progress to give rise to complications.
36. B introduces the problem of snakes, C states why there is not enough anti-snake serum, A elaborates on non-availability of the same, and D concludes the passage by stating what the final outcome could be.
37. B talks about the previous records of mid-term elections, and its implications on the present situation, A presents a contradictory fact, and C states the implications of this fact. D concludes the passage.
38. A introduces critical elections as the subject of the passage, B explains it, D states that none of the Indian elections so far has been a critical election, instead as C states, there have been many semi-critical ones.
39. A introduces the subject, B elaborates on it, D states who is the current champion of the game and C states who other contenders are.
40. A introduces the benefit of good advertising, C states why this benefit is important, B gives an example and D concludes by saying that in spite of this a minimum quality has to be maintained.
41. B uses the word 'it' that refers to the 'philosophy' in C and so CB is a mandatory pair. Moreover, A 'century ago', C 'for 90 years', and B 'today', makes a chain and D concludes the passage.
42. B states that RBI has wrested many powers from the government, A states that in spite of this the government has the final say, C elaborates on this fact and D questions this state of affairs.
43. B introduces the fact that the author was depressed, D gives a reason for the same, C shows the extent of his depression and A concludes the passage.
44. B introduces the idea of the possibility of stopping the decline in writing skills, C states how this is being done, D talks about a number of programmes being developed for the same and A gives the example of one such programme.
45. All others except 'kin' are synonyms.
46. All others except 'adapt' are synonyms.
47. All others except 'bell' refer to circular shapes. Bell is an object.
48. All others except 'computer' refer to some kind of a network.
49. Withstand is almost the opposite of the other three words.
50. All others except 'bridge' refer to some kind of a gap or opening.
51. In the first five paragraphs, the author makes it clear that Indians do not understand themselves yet. (a) is far from the truth. (b) is unlikely and (d) is not true.
52. The author tries to show what exactly was India's history like and what are the prospects for the future. The writer is making observations and analysing these, hence there is no reason why the attitude should be critical, cynical or cold.

53. Through the example he has tried to show us what centuries of slaughter and plunder actually meant for the country. (a) and (b) are not true, the writer is not glorifying the Vijayanagar empire.
54. The author is critical of people having a child's view of history and equates it with the slave's idea of the ruler's mercy. (b) is not true as the writer does take a critical stand on history. (c) is besides the fact.
55. The writer says that during British rule, and for 50 years after that, there was a revival of energy and intellect. (d) is not true in light of facts presented in the passage. (a) and (b) are not true in an isolated context.
56. With self-awareness, people ask for more of everything. (b) and (c) are both found in the ninth paragraph. (a) is simply not true.
57. He says that India's present situation is 'primitive and messy'. The writer has not expressed any pessimistic opinion 'bleak' or an extreme opinion 'horrific'.
58. Self-criticism is important for a country to be alive and progressive. Refer to the last paragraph. (b) and (c) are thus not true.
59. The writer says that the future will be fairly chaotic. (a), (c) and (d) find no mention in the passage.
60. Every invasion was accompanied by slaughter of the country's most talented people. (a) and (b) did take place, but it is (c) which is the main feature of the tyranny of foreign rulers.
61. The author is critical of the government policies. Refer to the beginning of each paragraph. The writer is not rude enough to be derisive. There is no reason for the writer to be sarcastic or ironical.
62. He is surprised as in all other cases government looked at the industrialists as crooks. (a) is a different point of view. (b) is a fact presented in the passage that does not contribute to the writer's surprise. (d) is not true as the reason is cited below the writer's feelings.
63. Foreign exchange bankruptcy and paucity of funds compelled government to open up its economy. (a) and (b) in no way influenced the government's move.
64. The author says that in another 50 years the world would have moved even further ahead. Hence, there is no room for any kind of optimism or pragmatism.
65. Its infrastructure should have helped India to perform better than other Asian countries. (c) is not cited in the passage. Given (b), (a) cannot be a better answer as India's infrastructure is compared with the infrastructure of the other countries.
66. (a) and (b) are reasons for India being in a better condition than other nations. Refer to the third paragraph. (c) is not stated in the passage.
67. Economic isolationism has led to India's poor performance. Refer to the beginning of the fourth paragraph. Hence, (b) and (c) are rendered void.
68. Government tried to protect its own industries through discouraging imports. Refer to the beginning of the fourth paragraph. Hence, (a), (c) and (b) are not the best answers.
69. While Korean Cielos are sold in India, no Indian cars are sold abroad. (a), (c) and (d) are opinionated answers, hence, not necessarily true.
70. Indian politicians are unable to see beyond their noses. Whether (b) and (c) are true or not is unclear from the passage.
71. The passage actually talks about the advantages of democracy. Hence, the opinions expressed in (a), (b) and (c) find no place in the passage.
72. The passage says that there is no guarantee that all dictatorships will be enlightened. Refer to the beginning of the third paragraph. Hence, there is no reason to mark (a), (c) or (d), though they may have a shade of truth.
73. The author sees a low but unfaltering rate of growth as a sign of stability amidst growth. (b) and (d) are not true. (a) is also doubtful, after all, how low can the growth be?
74. Dictatorships are more prone to making huge mistakes and risking everything on a single decision. (c) is a more complete answer as compared to (a) and (b).
75. The writer does not support statism under any circumstances. Refer to the penultimate paragraph. (a) is a confusing response. (c) and (d) do not address the question.
76. All the choices (a), (b) and (c) have been implied in the sixth paragraph.
77. The passage states that Internet will play an important role in the decades to come. Refer to the eighth paragraph. We cannot infer (b) for sure. (a) is almost stated in the passage.
78. Though (a) and (b) are desirable outcomes, they are not specifically stated in the passage.
79. The main reason is (b), the dictatorship factor that figures so often in the passage. (a), (c) and (d) may be desirable factors, but not conclusive.
80. (a), (b) or (c) have not been distinctly mentioned in the passage.
81. Infosys has awarded stock options among its employees. (b) has not been mentioned in the passage. Refer to the second paragraph.

82. Infosys does have a hierarchy, it does not have a hierarchy 'just' for control. Refer to the third paragraph. (d) may be true, but it is a rather vague response. (a) and (c) are not true.
83. He believes that betterment of man can happen through creation of wealth, ethically and legally. Refer to the sixth paragraph. Given (b), (a) and (c) are weaker choices.
84. The example highlights all the given facts. The qualities stated in (a), (b) and (c) are evident in the case.
85. Murthy believes that learning is a process that helps him learn through failure. (a) is not the focus of the question. Learning transcends (b) as per information given in paragraph 9.
86. Today the company works backwards to achieve its goals. Refer to the penultimate paragraph. Given (d), the other choices (a), (b) and (c) are weak.
87. Openness at Infosys includes payment of taxes as well as giving complete information. (c) sounds rather ambiguous.
88. (a) is stated in the last paragraph. (b) and (c) sound rather extreme.
89. Infosys' HR treats its employees as customers. (d) is directly stated in the passage in paragraph 4, line 3. (a), (b) and (c) are generic and not very strong contenders for the answer.
90. The CEO's actions set the template for all Infosians. (b), (c) and (d) do not reflect the truth as per the passage.
91. The diverse cultural and socio-economic factors are a major problem affecting the Indian education system. (a) and (c) are not stated in the passage.
92. 'Grizzled mandarins' refers to bureaucrats. It would be unfair to label the mandarins as (a), (b) or (c).
93. Those in charge of education are totally out of touch with the ground reality. This point is given in the fourth paragraph. Hence, it will not be necessary to mark (a), (b) or (d) as the answer.
94. The author advocates decentralizing education planning and implementation to improve the education system. This point is given in the fourth paragraph. Hence, it will not be necessary to mark (b), (c) or (d) as the answer.
95. Rajasthan, Bihar and Madhya Pradesh show very low education levels. The answer is given in the second paragraph. We are not sure about (a), (b) or (d).
96. The programme, launched in 1994, has been successful in 122 districts. The answer is given in the fifth paragraph. Choices (a), (b) and (d) are thus rendered void.
97. The village panchayats are responsible for scholarships, construction and maintenance of primary schools and for organizing non-formal education. We do not know if (a) forms part of the portfolio.
98. Politicians are specially responsible for obstructing the implementation of education policies as decentralization of educational administration will take away certain powers from them. We are not sure about the intentions of (a), (b) or (d).
99. None of the given statements can be related to primary education, on the basis of the passage.
100. The author advocates greater community involvement for successful implementation of education policy. This point is given in the fourth paragraph. We are not sure about either (b) or (c).
101. If he travels at minimum speed over stretch A (i.e. 40 km/hr), the total time taken to cover this stretch  

$$= \left(\frac{2}{40}\right) = \frac{1}{20} \text{ hr} = 3 \text{ min.}$$
 If he then travels at the fastest speed over stretch B (i.e. 50 km/hr), the total time taken to cover this stretch  

$$= \left(\frac{2}{50}\right) = \frac{1}{25} = 2.4 \text{ min.}$$
 Thus, total time taken over the first two stretches  

$$= (3 + 2.4) = 5.4 \text{ min.}$$
 In order to break the previous record he will have to cover the third stretch in  $(10 - 5.4) = 4.6 \text{ min.}$   
 To do this he will have to cover the third stretch at  

$$\left(\frac{2}{4.6}\right) = 0.434 \text{ km per minute or } 26.08 \text{ km/hr.}$$
 But the maximum speed over the stretch C is 20 km/hr. Hence, it is not possible for C to break the previous record.
102. The minimum speed in stretch A is 40 km/hr. If Mr Hare travels the first stretch at this speed, then the time taken by him to cover this stretch =  $\left(\frac{2}{40}\right) = 3 \text{ min.}$   
 Also he takes 3 min to cover stretch B. And he covers the entire race in  $(1.5 \times 10) = 15 \text{ min.}$  This means that he should have taken  $(15 - 3 - 3) = 9 \text{ min}$  to cover stretch C. Hence, his speed over this stretch should be  $\left(\frac{2}{9}\right) = 0.22 \text{ km per minute or } 13.3 \text{ km/hr.}$
103. Let his average speed over the last stretch be  $x$ . Hence, his average speed for first two stretches =  $4x$ . So total time taken to cover the three stretches  

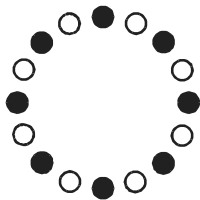
$$= \left(\frac{4}{4x}\right) + \left(\frac{2}{x}\right)$$
 His average speed over the race is 20 km/hr.  
 Hence, time taken to complete the race =  $\left(\frac{6}{20}\right)$

Hence, we have the equation  $(\frac{4}{4x}) + (\frac{2}{x}) = (\frac{6}{20})$

Solving this equation, we get  $x = 10$  km/hr

104. Although the number of students in group D is more than in any other group, we still cannot say anything about the average weight of this group as nothing is mentioned about the average weights of any of the groups or of individual students.
105. Although one student is shifted from group A to group B, the number of students in the class and the total weight of the students remain the same. Therefore, the average weight of the class remains the same.
106. The total weight of any group will vary according to the number of students in that group. Hence, the total weight of group A and C which has  $(15 + 25) = 40$  will be twice that of students in group B which has 20 students. However, it is clear that if all the students are of same weight, then the average weight of all groups remains same irrespective of how many students are present in each group. Hence, clearly the statement 3 is false
107. Let his marks be 100, 90, 80, 70 and 60 in the five subjects. Hence, totally he has scored 400 marks. This constitutes only 60% of the total marks. Hence,
- $$\text{total marks} = \frac{400}{0.6} = 667, \text{ which incidentally is the maximum marks in all 5 subjects. Since the total marks in each subject is the same, hence maximum marks in each subject will be } (\frac{667}{5}) \approx 133. \text{ Out of this 50\% is the passing marks. In other words, to pass in a subject he needs to score 66.5 marks. We can see that only in one subject he scored less than this, viz. 60. Hence, he passed in 4 subjects.}$$

108.



If we consider the Chairman and the vice chairman as one set, we can see that this set can fit 8 slots in between the 8 directors. Hence, this can be done in 8! ways. Between themselves, the chairman and the vice chairman can be arranged in 2 ways. Hence, the required answer =  $2 \times 8!$ .

109. We know that if  $\log_a x = y$ , then  $x = a^y$ . So comparing this form with our equation, we can get  $\log_7(x^2 - x + 37) = 2^1 = 2$  and furthermore from this we can say that

$$(x^2 - x + 37) = 7^2 = 49$$

Thus, we have the equation

$$x^2 - x - 12 = 0$$

The solutions of this equations are,

$$x = 4 \text{ or } x = -3.$$

The value that satisfies the given answer-choices is  $x = 4$ .

110. **Hint:** Students please note that the percentages that are given are the basic percentages derived from

basic fractions. e.g.  $11.11\% = \frac{1}{9}$  and  $14.28 = \frac{1}{7}$ .

Hence, you should make the most of this knowledge.

So let the CP be Re 1. Since he makes a profit of  $\frac{1}{7}$ ,

$$\text{his SP} = (1 + \frac{1}{7}) = \text{Rs. } \frac{8}{7}.$$

His marked price should be  $\frac{1}{9}$  above this. So if we

subtract  $\frac{1}{9}$  of MP from the MP, we will get the SP.

$$\text{So } (MP - \frac{1}{9} MP) = SP = \frac{8}{7}$$

$$\text{Hence, } MP = \frac{9}{7}$$

Therefore, percentage of mark-up on CP =  $(MP - CP)/CP$

$$= (\frac{9}{7} - 1)/1$$

$$= \frac{2}{7} = 2(\frac{1}{7})$$

$$= 2 \times 14.28$$

$$= 28.56\%$$

**Alternative method:**

We can use the formula  $z = x - y - \frac{xy}{100}$ , where

$z$  = Gain percentage

$x$  = Percentage above CP

$y$  = Discount percentage

$$\therefore 14.28\% = x - 11.11\% - \frac{11.11x}{100}$$

$$\text{or } 14.28 = \frac{100x - 1111 - 11.11x}{100}$$

$$\text{or } 1428 - 1111 = 88.89x$$

$$\text{or } x = 28.56\% \text{ (Approximately)}$$

111. The given expression can be written as

$$\left(\frac{16n^2}{n}\right) + \left(\frac{7n}{n}\right) + \left(\frac{6}{n}\right) = 16n + 7 + \left(\frac{6}{n}\right)$$

Since  $n$  is an integer, the expression  $(16n + 7)$  will always be an integer. Hence, for the entire expression

to be an integer, the part  $\left(\frac{6}{n}\right)$  should also be an integer.

This can be possible only if  $n$  is a factor of 6, viz.  $n = 1, 2$  and  $3$ . Hence,  $n$  can have three values.

112. Let him mix 3 kg, 4 kg and 5 kg of dry fruits at Rs. 100, Rs. 80 and at Rs. 60 per kilogram respectively. Hence, his effective cost of the dry fruits per kilogram should be the weighted average

$$= \left( \frac{3 \times 100 + 4 \times 80 + 5 \times 60}{3 + 4 + 5} \right) = \frac{920}{12}$$

In order to make a 50% profit, he will have to sell it at

$$\left( \frac{920}{12} \times 1.5 \right) = \frac{920}{12} \times \frac{3}{2} = \frac{920}{8} = \text{Rs. } 115 \text{ per kilogram.}$$

Since none of the answer-choices confirms this, the answer is (d).

113. 20 kg fresh grapes will contain  $(0.9 \times 20) = 18$  kg water and 2 kg mass. If the dry grape has to contain 2 kg mass, it should constitute 80% of that. Hence, if 80% of dry grapes corresponds to 2 kg, its total

$$\text{weight will be } \left( \frac{2}{0.8} \right) = 2.5 \text{ kg}$$

114. Effective speed of two trains  $= (80 - 40) = 40$  km/hr. (Since they are moving in the same direction as inferred from the word 'overtakes'). At this speed in 54 s, they

$$\text{would travel an effective distance of } \frac{(40 \times 54)}{3600}$$

$= 0.6$  km or 600 m. This effective distance should be equal to the sum of the lengths of the two trains. So, if length of the express train is  $L$ , length of the goods train will be  $2L$ . Hence, our equation will be  $L + 2L = 600$  or  $L = 200$  m.

So the time taken by this train to cross a platform

$$400 \text{ m long will be } = \frac{(200 + 400)}{\left(80 \times \frac{5}{18}\right)} = 27 \text{ s.}$$

(Note that we have converted the denominator in

metres per second. Hence, the factor of  $\frac{5}{18}$ ).

115. This equation is very straightforward. If the number is 'x', then  $\frac{7x}{8} - \frac{7x}{18} = 770$ . On solving this equation, we get  $x = 1584$ .

**Hint:** Students please note that if the difference in

$\frac{7}{8}$  and  $\frac{7}{18}$  of a number is 770, then the difference in

$\frac{1}{8}$  and  $\frac{1}{18}$  of the number should be 110. If we express

this as an equation, we get

$$\frac{x}{8} - \frac{x}{18} = 110$$

$$\text{or } 10x = 110 \times 18 \times 8$$

$$\text{or } x = 11 \times 18 \times 8$$

You can further proceed from here in two ways: (i) the last digit of the required answer should be  $(1 \times 8 \times 8) = 4$ , (ii) number should be divisible by 11. In both cases, the answer that is obtained from the given choices is 1584.

116. If we were to express 64 as product of two positive integers, we can get the following combinations:  $(64 \times 1)$ ,  $(32 \times 2)$ ,  $(16 \times 4)$ ,  $(8 \times 8)$ . Thus, we find that  $P + Q$  cannot be 35.

117. Total marks scored by the student in 10 papers  $= (80 \times 10) = 800$ . If we exclude the papers in which he scored the highest and the lowest marks, then the total marks scored by him in remaining 8 papers  $= (81 \times 8) = 648$ . Hence, his total in these two papers in which he scored the highest and the lowest marks  $= (800 - 648) = 152$ . Since his highest score is 92, his lowest score is  $(152 - 92) = 60$ .

118. We know that the sum of the roots  $= -\frac{b}{a}$ .

Hence,  $x_1 + x_2 = 2$ . Now we have two equations, viz.  $x_1 + x_2 = 2$  and  $7x_2 - 4x_1 = 47$ . Solving these two equations, we get  $x_1 = -3$  and  $x_2 = 5$ . Since it does not satisfy options (b) and (c), we will verify it for option

(a). The product of roots  $= (-3) \times 5 = -15$ ,  $\frac{c}{a}$  in our case is  $c$ . Hence,  $c = -15$ .

#### Alternative method:

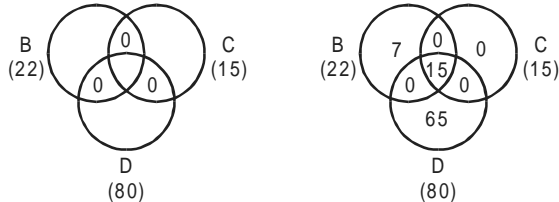
Put values of  $x_1, x_2$  in equation (ii). Do not match. So put  $c = -15$  in equation (i) to get the roots of equation. After finding the roots of equation (i), check whether they satisfy equation (ii) or not. The roots  $(5, -3)$  satisfy equation (ii) so answer is (a).

119. If the radii of two circles are  $r_1$  and  $r_2$ , then the two equations can be written  $\pi r_1^2 + \pi r_2^2 = 153\pi$  or  $(r_1^2 + r_2^2) = 153$  and  $r_1 + r_2 = 15$ . Now  $r_1^2 + r_2^2 = (r_1 + r_2)^2 - 2r_1r_2$ . Therefore,  $153 = (15)^2 - 2r_1r_2$  or  $r_1r_2 = 36$ . If 36 is to be expressed as product of two integers, it could be  $(36 \times 1)$ ,  $(18 \times 2)$ ,  $(12 \times 3)$ ,  $(9 \times 4)$ ,  $(6 \times 6)$ . The only two factors that add up to 15 are 12 and 3. Hence,  $r_1 = 12, r_2 = 3$ . Therefore, the ratio of larger radius to the smaller one is  $12 : 3 = 4$ .

120. **Hint:** Students please note that the best way to solve this is the method of simulation, e.g. let  $m = 10$  and  $n = 5$ . Hence,  $m - n = 5$ , which is divisible by 5.  $m^2 - n^2 = 100 - 25 = 75$ , divisible by 25.  $m + n = 10 + 5 = 15$  is not divisible by 10. Hence, the answer is (c). Note that for the sum of two multiples of 5 to be divisible by 10, either both of them should be odd (i.e. ending in 5) or both of them should be even (i.e. ending in 0).

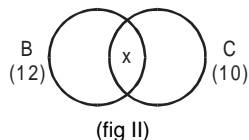
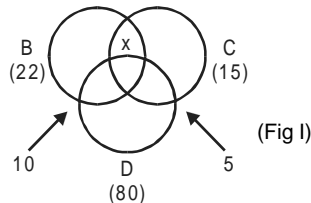
121.  $7^{3^2} = 7^9$  and  $(7^3)^2 = 7^6$ . Since  $7^9 > 7^6 \Rightarrow 7^{3^2} > (7^3)^2$

122. In order to maximise the percentage of people who watch all the three channels, we should assume the number of people who watch exactly two channels is zero. The Venn diagram will hence be as shown on the right. It can be observed that the maximum value that the central area can take will be equal to one of the extreme three values and it will indeed be the least of the three values. In our case, it will be 15%. So the Venn diagram will look as shown.



**Hint:** Students please note that if nothing is mentioned about the people who watch two or more channels and also about people who watch exactly one channel, then the maximum value that (all the three) can take is the least among the three extreme values. In our case, it is 15%.

123. If we consider that people watching BBC and CNN only as 'x', we will get the Venn diagram I. Now from this diagram, if we remove the people, who watch DD, viz. 80%, we will be left with the diagram given below. (Figure II)



Now this can be solved as a normal two sets of problems, with at least  $1 = 20\%$  (since we have removed 80% who watch DD, the number of people who fall in this area should be 20%). Note also that we have taken B as 12% and C as 10%. This is so, because among 80% who watch DD, there are 10% who watch BBC as well and 5% who watch CNN as well. Hence, we can apply the formula:  $20 = 12 + 10 - x$  or  $x = 2$ . Therefore, only 2% of the people watch BBC and CNN only.

124. It can be observed that without knowing what percentage of the people watched BBC and CNN or what percentage of people watched only DD, this

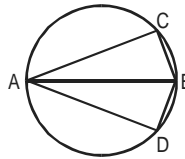
question cannot be answered. This can further be verified by the fact that the answer choices (a) and (b) are both a valid answer-choices. Also anything less than or equal to 5% will be a valid answer (it cannot exceed 5% as percentage who watched DD and CNN is 5%).

125. The two equations can be written

$$2000 \left( \frac{x}{100} \right) + 2000 \left( \frac{y}{100} \right) = 700 \text{ and } 2000 \left( \frac{x}{100} \right) + 3000 \left( \frac{y}{100} \right) = 900$$

The equations can be simplified to  $x + y = 35$  and  $2x + 3y = 90$ . Solving these two equations simultaneously, we get  $x = 15\%$ .

126.



Since AB is the diameter of the circle,  $\angle ACB$  would be right angle. In this triangle, we know  $AB = 15$  and  $AC = 12$ . So we can find BC. Since 3-4-5 forms a triplet,  $3 \times (3-4-5)$  also forms a triplet. So 9-12-15 forms a triplet. Hence,  $BC = 9$ . Since  $BC = BD$ ,  $AD = AC$  (similar triangles).

Hence, area of  $\triangle ACB = \text{Area of } \triangle ABD$

$$= \frac{1}{2} AC \times CB = \frac{1}{2} \times 12 \times 9 = 54$$

So area of quadrilateral ACBD =  $2 \times 54 = 108$  sq. cm. None of the answer-choices matches this.

127. As P, Q and R are consecutive odd numbers,  $Q = P + 2$  and  $R = P + 4$ . Now  $3P = 2(P + 4) - 3$ . On solving this equation, we get  $P = 5$ . Therefore,  $R = 5 + 4 = 9$

128. This question can be done fast by assuming some values for x, y and z, e.g. let  $x = 4$ ,  $y = 3$  and  $z = 1$ . Thus,  $la(4, 3, 1) = \min(7, 4) = 4$ .  $le(x, y, z) = \max(1, 2) = 2$ .

$ma(x, y, z) = \frac{1}{2} (4 + 2) = 3$ . Hence, we can see that the only answer-choice that satisfies the relationship is  $ma(x, y, z) < la(x, y, z)$ .

$$\begin{aligned} 129. \quad & ma(10, 4, le(la(10, 5, 3), 5, 3)) \\ &= ma(10, 4, le(\min(15, 8), 5, 3)) \\ &= ma(10, 4, le(8, 5, 3)) \\ &= ma(10, 4, \max(3, 2)) \\ &= ma(10, 4, 3) \end{aligned}$$



$$= \frac{1}{2} [le(10, 4, 3) + la(10, 4, 3)]$$

$$= \frac{1}{2} [\max(6, 1) + \min(14, 7)]$$

$$= \frac{1}{2} (6 + 7) = 6.5$$

130.  $le(15, \min(10, 6), le(9, 8, ma(15, 10, 9)))$

$$\text{Now } ma(15, 10, 9) = \frac{1}{2} [le(15, 10, 9) + la(15, 10, 9)]$$

$$= \frac{1}{2} [\max(5, 1) + \min(25, 19)]$$

$$= \frac{1}{2} (5 + 19) = 12$$

Hence, our original expression would now be

$$le(15, \min(10, 6), le(9, 8, 12))$$

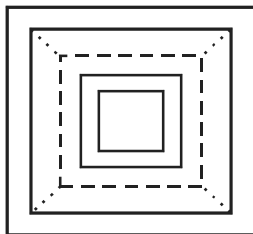
$$= le(15, 6, \max(1, -4))$$

$$= le(15, 6, 1) = \max(9, 5) = 9$$

131. The value of the number  $ABC = 100A + 10B + C = A! + B! + C!$ . Since it is a three-digit number, the maximum value that it can have is 999. But looking which means the number is less than  $7!$  (as  $7! = 5040$ ). So the individual digits should obviously yield less than  $7!$ . From the answer-choices, we can see that the answer could be 4 or 2.

$4! = 24$  and  $2! = 2$ . So let us find the two remaining digits.  $1! = 1$ ,  $3! = 6$ ,  $5! = 120$  and  $6! = 720$ . Now it can be observed that one of the remaining two digits has to be either 5! and/or 6!, as any other combination when added to  $2!$ , or  $4!$  does not yield a three-digit answer (i.e.  $> 100$ ). Hence, the four combinations that we have are  $2! + 5! = 122$ ,  $2! + 6! = 722$ ,  $4! + 5! = 144$  and  $4! + 6! = 744$ . Knowing that the remaining digits can be 1 or 3 or (2 or 4), i.e. in value of factorial terms 1, 6, (2 or 24), we can see that the only combination that fits our requirement is  $144 + 1 = 145 = 1! + 4! + 5!$ .

132.



The diagonal of the innermost square is 2 units. The diagonal of every successive square would increase by 2 units (since corners are one unit apart). So the diagonal of the 7th square = 14 and that of the 8th square = 16. Areas of the 7th square =  $\frac{1}{2} 14^2$  and that

of 8th square =  $\frac{1}{2} 16^2$ , i.e. 98 and 128 respectively.

Hence, the difference in their areas

$$= (128 - 98) = 30 \text{ sq. units.}$$

133.

$$A = \frac{2.000004}{[(2.000004)^2 + 2(2.000004)]}$$

$$= \frac{2.000004}{2.000004[(2.000004) + 2]}$$

$$= \frac{1}{[(2.000004) + 2]}$$

$$= \frac{1}{4.000004}$$

$$= \frac{1}{4} = 0.25 \text{ (Approximately)}$$

$$B = \frac{3.000003}{[(3.000003)^2 + 3(3.000003)]}$$

$$= \frac{3.000003}{3.000003[(3.000003) + 3]}$$

$$= \frac{1}{[(3.000003) + 3]} = \frac{1}{6.000003}$$

$$= \frac{1}{6} = 0.166 \text{ (Approximately)}$$

$$C = \frac{4.000002}{[(4.000002)^2 + 2(4.000002)]}$$

$$= \frac{4.000002}{4.000002[(4.000002) + 2]}$$

$$= \frac{1}{[(4.000002) + 2]} = \frac{1}{6.000002}$$

$$= \frac{1}{6} = 0.166 \text{ (Approximately)}$$

Looking at the answer choices, we can see that the only (d) satisfies the relationship, viz. B is the smallest.

134.

Let  $D_1, T_1$  and  $D_2, T_2$  denote the diameters and the thickness of the two coins respectively. If  $V_1$  and  $V_2$  are the values of the two coins

$$\frac{V_1}{V_2} = \frac{(D_1^2 T_1)}{(D_2^2 T_2)} = \left(\frac{D_1}{D_2}\right)^2 \left(\frac{T_1}{T_2}\right)$$

$$\text{Therefore, } \frac{4}{1} = \left(\frac{4}{3}\right)^2 \left(\frac{T_1}{T_2}\right) \text{ or } \left(\frac{T_1}{T_2}\right) = \frac{9}{4}$$

135. In a triangle, the line joining the mid-points of any two sides is half the length of its third side. Hence, every side of  $\Delta PQR$  would be half the sides of  $\Delta ABC$ . Hence,

area of  $\Delta PQR$  would be  $\frac{1}{4}$  the area of  $\Delta ABC$

$$= \frac{1}{4} \times 20 = 5 \text{ sq. units.}$$

136. Let  $L$  and  $B$  denote the length and the breadth of the rectangle. So diagonal will be  $\sqrt{L^2 + B^2}$ . Hence, from

the data given,  $(L + B) - \sqrt{L^2 + B^2} = \frac{1}{2} L$ .

$$\text{So } \sqrt{L^2 + B^2} = \frac{L}{2} + B$$

Squaring both sides, we get  $(L^2 + B^2) = (\frac{L}{2} + B)^2$ , i.e.

$$L^2 = \frac{L^2}{4} + LB$$

$$\text{Therefore, } \frac{3L^2}{4} = LB \text{ or } \frac{B}{L} = \frac{3}{4}$$

**Shortcut:**

First write the relation,  $(L + B) - \sqrt{L^2 + B^2} = \frac{1}{2} L$ .

$$\frac{L}{2} + B = \sqrt{L^2 + B^2}$$

Put the values of options. Option (d) satisfies. So the answer is (d).

137. As there is no day in the week whose first letter is R, it can be concluded that Raja does not have any holidays. Since 1996 is a leap year, we can figure out that Raja has totally worked for 7 days. Let his rate of doing the job be one unit per day. So he would complete 7 units work in a week. J's situation is similar to Raja and does not have any holiday during the week. T will have two holidays in a week (Tuesday and Thursday). Since the rate of working for all the three of them is the same, the working pattern of J and T would be as follows.

We can see that depending on which day is February 25, 1996, to complete 7 units, they would either take 4 days or 5 days. Hence, the answer is (c).

Sun.	Mon.	Tue.	Wed.	Thurs.	Fri.	Sat.
2 units	2 units	1 unit	2 units	1 unit	2 units	2 units

138. Now Raja has worked for (5 days in February + 31 days in March + 2 days in April) = 38 days. Let us assume his rate to be the same as in the previous question, viz. one unit a day. Hence, he completes 38 units totally. In a week, T takes holiday on Tuesday

and Thursday, while S takes holiday on Saturday and Sunday. We can see that their working pattern would be as follows.

Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
1 unit	2 units	1 unit	2 units	1 unit	2 units	1 unit

So in a week they work together 10 units work. Thus, in three weeks, they would complete 30 units work. It can be found out that February 25 is Sunday. So the remaining 8 units of work can be completed only on Friday, i.e. March 22.

**For questions 139 to 141:**

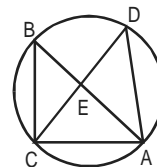
Let us convert all the time to same time zone, viz. Boston. So X left Frankfurt at 6 p.m. on Friday (Frankfurt time) or 10 p.m. on Friday (Boston time). X reached Boston at 10 a.m. on Saturday (Boston time). In other words, X has taken 12 hr in all to go from Frankfurt to Boston. After 2 hr wait, X leaves at 12 noon (Boston time). Now X reaches India at 1 a.m. on Sunday (Indian time) or 11 a.m. on Saturday (Boston time). Thus, X takes 11 hr in all to go from Boston to India.

139. Overall, X has travelled for 25 hr (including stoppages) at an average speed of 180 miles per hour. Hence, the distance between Frankfurt and India is  $(25 \times 180) = 4500$  miles.
140. On the return journey, X halts at Boston for one hour less than his previous halt there. Therefore, X takes 24 hr for his return journey.
141. Since distance between Frankfurt and India is 4,500 miles, overall distance travelled by him (to and fro) =  $9000$  miles. And he has taken  $(25 + 24 + 1\frac{11}{12}^*)$  =  $50\frac{11}{12}$  hr in all to cover this distance.

\*Note:  $1\frac{11}{12}$  hr has been accounted for the halt that he had in India (from 1 a.m. to 2.55 a.m.). Hence, his

average speed for the entire journey =  $\frac{9000}{(50\frac{11}{12})^*}$ , i.e. 176.75 mph.

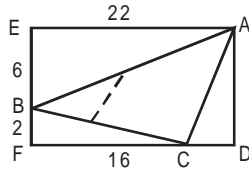
- 142.



It can be seen that in  $\Delta CBE$  and  $\Delta ADE$ ,  $\angle CBA = \angle CDA$  (as both of them subtend the same arc at the circumference). Similarly,  $\angle BCD = \angle BAD$ . Since two of the angles are congruent, the third angle also has to be congruent. Hence, the two triangles are similar

(A-A theorem). So the proportion of its sides also be the same. Since  $\frac{BC}{DA} = \frac{12}{24} = \frac{1}{2}$ ,  $\frac{BE}{DE} = \frac{CE}{AE} = \frac{1}{2}$ . Since all the sides of the two triangles are in the ratio  $\frac{1}{2}$ , their areas will be in the ratio  $\frac{1}{4}$ .

143.



We know that length of the line joining the mid-points of two sides of a triangle is half the length of third side. Hence, the required length is half the length of side AC. Since EADF is rectangle,  $EF = AD = 8$ .  $CD = (22 - 16) = 6$ .

So in the right-angled  $\triangle ADC$ ,  $AD = 8$  and  $CD = 6$ . Therefore,  $AC = 10$ . Hence, length of the line joining

the mid-points of AB and BC =  $\frac{1}{2}(10) = 5$ .

144. Since the policeman started 15 min late, in this time the thief would have already covered  $(\frac{60}{4}) = 15$  km. To

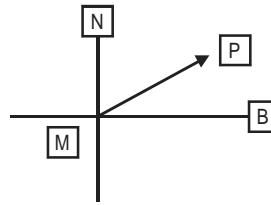
catch the thief, the policeman will have to make up for this distance of 15 km. Every hour the policeman is travelling  $(65 - 60) = 5$  km more than the thief. Hence, to make up the distance of 15 km, he would take 3 hr. Since policeman started at 12.15 p.m., he would catch the thief at 3.15 p.m.

145. Every hour the second policeman covers  $(65 - 60) = 5$  km less than the first one. Since the first policeman catches the thief in 3 hr, in this time the second policeman will be  $(3 \times 5) = 15$  km behind.

146.  $a^3 + b^3 = (a + b)(a^2 + b^2 - ab)$ . Combining statements I and II, we get the value of  $(a + b) = \sqrt{28}$  or  $-\sqrt{28}$ . Since we do not have the unique value of  $(a + b)$ , we cannot get the unique answer  $a^3 + b^3$ .

147. 11 and 9 are coprimes of 99, and hence the number divisible by 99 must be divisible by 9 and 11. Certainly statement I alone is sufficient to answer the question. Statement II says when the digits of the number are reversed, the new number formed is divisible by 9 and 11. The best way to handle this particular case is by simulation. Let us select any number which is divisible by 9 and 11. Let us select 1386 which is divisible by 9 and 11. Hence, the original number will be 6831 which, in turn, is also divisible by 99. Hence, statement II also is independently sufficient to answer the question. Since both the statements are independently sufficient to answer the question, the answer is (b).

148.



The diagram will be as shown. M is Mali and P is Pali.

Consider statement I. When the person covers  $\frac{1}{3}$  distance, he is 3 km east and 1 km north of Mali. Based on this statement alone, we can easily find out where he will be on line MP by using Pythagoras' theorem. Once we find this distance, we can easily get distance MP by multiplying it by 3. Similarly, based on statement II alone also, we can find distance MP. Hence, both the statements are independently sufficient to answer the question. Hence, the answer is (b).

149. Students! be careful. Generally, as we see two unknowns (i.e.  $x$  and  $y$  in this case) and two equations, we tempt to mark the answer as c, i.e. combining two statements, we can easily find the values of  $x$  and  $y$ . But have a look at the equations  $3x + 2y = 45$  and  $10.5x + 7y = 157.5$ . Multiplying 1st equation by 3.5, we get 2nd equation. Hence, these are not really two different equations. Hence, data is insufficient to answer the question. In general, remember the following rule. If we have two equations  $Ax + By = k_1$  and  $Cx + Dy = k_2$ , and  $A \times D = B \times C$ , then the equations cannot be solved.

150. P says he can see one black and one white hat. So either Q is wearing white and R is wearing black, or Q is wearing black and R is wearing white. Q also makes same statement. Still we cannot say the colour of the hat which P is wearing.

151. Let speed of the motorcycle be  $x$  km/hr. Therefore, speed of the car will be  $(x + 10)$  km/hr. From statement II, we can form the following equation.

$$\left(\frac{100}{x+10}\right) = \left(\left(\frac{100}{x}\right) + 2\right)$$

After solving this equation, we can get the speed of the car. Hence, this question can be answered by combining both the statements.

152. Let  $V_1$  be the original volume and  $r_1$  and  $h_1$  be the radius and height of the cone respectively.

$V_1 = \left(\frac{1}{3}\right) \times \pi \times (r_1)^2 \times h_1$ . Consider statement I. If the cone is cut parallel to base and dividing the height in

the ratio 1 : 2, then  $r_2 = \left(\frac{1}{2}\right) \times r_1$  and  $h_2 = \left(\frac{1}{2}\right) \times h_1$ ,

where  $r_2$  and  $h_2$  are the radius and height of the new cone respectively. If  $V_2$  is volume of new cone,

$$\text{then } V_2 = \left(\frac{1}{3}\right) \times \pi(r_2)^2 \times h_2$$

$$= \left(\frac{1}{3}\right) \times \pi \times \left(\frac{1}{2} \times r_1\right)^2 \times \left(\frac{1}{2}\right) h_1 = \left(\frac{1}{8}\right) \times V_1$$

Hence, statement I alone is sufficient to answer the question. (As we get the ratio as 1 : 8) Similarly, based on statement II alone, we can find the ratio. (Which will be 1 : 27)

153. If we solve the two given equations, we get the point of intersection as (3, 2). Let A = (3, 2). The lines of our interest (let it be  $L_1$  and  $L_2$ ) also pass through A. One of the lines passes through (0, 4). Let  $L_1$  passes through (0, 4), but it also passes through (3, 2). Hence,

we can find the slope of  $L_2$  (which is equal to  $-\frac{2}{3}$ ).

Hence, slope of  $L_2$  will be  $\frac{3}{2}$  since  $L_1$  and  $L_2$  are

perpendicular. Hence, equations of  $L_1$  and  $L_2$  can be obtained by using slope point form. (Students! we need not really find out the equations.) After getting both the equations, we can find the area bounded by  $L_1$  and  $L_2$  and coordinate axes.

154. Let A and B be the CP of the chair and the table respectively. So  $1.15A + 1.2B = SP$ . Hence, profit =  $0.15A + 0.2B$ . Now consider statement II, CP =  $1.1A + 1.2B$ . As per new CP, now profit will be  $(1.15A + 1.2B) - (1.1A + 1.2B) = 0.05A + 0xB = 0.05A$ . Combining both statements, we get the equation as  $0.05A = 0.15A + 0.2B - 20$ . Still we cannot find the answer.

155. None of the statements specifies the direction in which Tez and Gati are moving, which is very significant.

156.

Company	Cost/Room
Lokhandwala	$225/536$ " $225/535 = 0.42$
Raheja	$250/500 = 0.50$
IHCL	$275/600 = 0.45$
ITC	$300/300 = 1$

From the right-side column, for Lokhandwala Group, cost per room is least.

157. In previous question, we have found out for which group the cost per room is least. To answer the second question, we need to take the reciprocals of fractions in the first question. Naturally, the answer will be same, i.e. Lokhandwala Group.

158. Two projects are completed in 1998, one is Mumbai Heights and the second is Royal Holidays. The cost of project is  $250 + 225 = 475$  crore. \*Cost incurred =  $475 + 47.5 = 522.5$ . (Students please note

the last step. Rather than doing  $1.1 \times 475$ , it is convenient to do  $475 + 10\%$  of 475, which is =  $475 + 47.5$ )

159. Four projects are completed in 1999. They are: (i) Majestic Holiday, (ii) Supremo Hotel, (iii) Windsor Manor and (iv) Leela Hotels. It is very much similar to previous situation.

The cost of project is  $250 + 300 + 275 + 235 = 1060$   
Hence, the cost incurred =  $1060 \times (1.1)^2$   
= 1282.6 crore

160. Students! read the question carefully. It says what is the cost of projects completed by 2000.

It will be addition of previous two answers + Cost incurred for the projects completed in 2000. Approximate cost of projects completed by 2000 is  $1282.6 + 522.5 + (250 \times (1.1)^3) \approx 2140$ .

161.

Year	Male population	Female population	Total	Per capita production
1990	34	36	70	$5/70 = 0.071$
1992	35	37	72	$7/72 = 0.09$
1994	39	37	76	$7.6/76 = 0.1$
1996	43	40	83	$7/83$ " $7/84 = 0.08$

From the table, it is clear that in 1990, the per capita production of milk was least.

162. We can prepare a similar kind of table, that we prepared for previous question. This table prepared is for food grains.

Year	Total population	Per capita production
1992	72	$20/72 = 0.27$
1993	74	$22/74 = 0.297$
1994	76	$25/76$ " $25/75 = 0.33$
1995	80	$31/80$ " $30/80 = 0.375$

Hence, per capita production of foodgrains was maximum in 1995.

163. Percentage increase in production of food

Year	Production of foodgrains	% increase = X	Production of milk	% increase = Y	X - Y
1992	20		7		
1993	22	$2/20 = 10\%$	8	$1/7 = 14.2\%$	-4.28%
1994	25	$3/22 = 13.6\%$	7.5	$-0.5/8 = -6.2\%$	19.8%
1995	31	$6/25 = 24\%$	6.8	$-0.7/7.5 = -9.3\%$	33.3%
1996	23	$-9/32 = -28.1\%$	7	$0.2/6.8 = 2.9\%$	31%

From the last table, it is clear that in 1995, the difference between percentage increase in production of foodgrains and percentage increase in production of milk was maximum.

164.

Year	Per capita consumption of milk = A	Calories consumed = X(X = 320x A)	Per capita consumption of foodgrains = B	Calories consumed = Y(Y = 160 x B)	X + Y
1993	0.11	35.2	0.28	44.8	80
1994	0.1	32	0.33	52.8	84.8
1995	0.093	29.76	0.37	59.2	88.96
1996	0.08	25.6	0.33	52.8	78.4

From the last column of the table, it is clear that the per capita consumption of calories was highest in 1995.

165.

Year	Production of milk = A	Availability of nutrient = 120A = X	Production of foodgrains = B	Availability of nutrient = 60B = Y	X + Y
1993	8	960	22	1320	2280
1994	7.5	900	25	1500	2400
1995	6.8	816	32	1920	2736
1996	7	840	23	1380	2220

Clearly, from the table, availability of nutrient is maximum in 1995.

166.

Year	Total population	Per capita consumption of nutrient
1993	74	$2280/74 = 30.81$
1994	76	$2400/76 = 31.5$
1995	80	$2736/80 = 34.2$
1996	83	$2220/83 = 26.7$

From the table, it is clear that the per capita consumption is maximum in 1995.

**For questions 167 to 172:**

The values in the graph can be represented in the table given below.

Here O.H. is overheads and Int. is interest, P/C is profit/cost.

Year	Raw Mat.	Wages	O.H.	Int.	Profit
1991	60	45	10	50	15
1992	50	55	20	55	25
1993	65	60	15	55	20
1994	75	65	25	50	-30
1995	80	65	20	50	15
Total	330	290	90	260	45

167. We can see that the increase in raw material has been maximum in 1993, viz. 15 points increase.

168. The change in the profit is maximum in 1993-94. In this year, there is a 50 points drop in the profits.

169. It can be seen that the interest has remained more or less constant over the given period.

170.

Year	Raw Mat.(RM)	O.H.	OH/RM x 100
1991	60	10	16.66%
1992	50	20	40%
1993	65	15	23.07%
1994	75	25	33.33%
1995	80	20	25%

Thus, it can be seen from the above table that the overheads as a percentage of raw material is maximum for 1992.

171.

The total profits over the period  
 $= (15 + 25 + 20 - 30 + 15) = 45$   
 Total costs  
 $= (330 + 290 + 90 + 260) = 970$

Hence, profit/costs =  $\frac{45}{970} = 4.6\%$   
 $= 5\%$  (Approximately)

172.

If the interest component is not included in the cost, the data can be represented as follows.

Year	Cost	Profits	P/C x 100
1991	115	15	13.04%
1992	125	25	20%
1993	140	20	14.28%
1994	165	-30	-
1995	165	15	9.09%

Hence, we can see from the table that maximum profit per unit cost is in 1992.

173. If the amount of tariff consumed by sector 1 is the same, then we can directly compare the tariffs to the two regions and get the answer.

	Tariff 1994-95	% change over 1991-92	Tariff 1991-92
Region 1	425	+15%	369.5
Region 2	472	+5%	449.5
Region 3	420	-4%	437.5
Region 4	415	+8%	384.25
Region 5	440	+10%	400
	2172		2040.75

Hence, we can see that as compared to 1991-92, the net tariff in 1994-95 increased by

$$\frac{(2172 - 2040)}{2040} = 6.5\%$$

174.

	Tariff 1994-95	% change over 1991-92	Tariff 1991-92
Sector 1	420	-4	437.5
Sector 2	448	+7	418.7
Sector 3	432	+6	407.5
Sector 4	456	+10	414.5
			1678.3

Hence, the average tariff for region 3 in 1991-92 is

$$\frac{1678.3}{4} = 419.5 = 420 \text{ (Approximately)}$$

175

In 1994-95, the power consumed by various sectors out of 7875 megawatts can be given as follows.

Category	Percentage	Consumption in 94-95
Urban	25	1969
Domestic	20	1575
Industrial	40	3150
Rural	15	1181
		7875

Since there was a 10% decrease in domestic consumption of power in 1994-95, the domestic

$$\text{consumption in 1991-92} = \left( \frac{1575}{0.9} \right) = 1750 \text{ megawatts.}$$

But this constitutes 20% of total power consumed in 1991-92 and the rural consumption constitutes 15% of total power in 1991-92. Hence, in 1991-92, the rural

$$\text{consumption} = (1750 \times \frac{15}{20}) = 1312 \text{ megawatts.}$$

176. We only know the tariff rates for the two years for various regions and sectors. But we do not know the category-wise break-up of tariffs, i.e. the rates for urban sector is not known. In the light of this, we cannot answer this question.

177. Let us evaluate each of the above statements. The average tariff in region 4

$$= \frac{(415 + 423 + 441 + 451)}{4} = 432.5 \text{ p/kwh}$$

$$\text{region 2} = \frac{(472 + 468 + 478 + 470)}{4} = 472 \text{ p/kwh}$$

$$\text{region 5} = \frac{(440 + 427 + 439 + 446)}{4} = 438 \text{ p/kwh}$$

Hence, the average tariff in region 2 is higher than in region 5. This statement is true. Note that we cannot evaluate the third statement at all.

178. In 1974, agricultural loans amounted to = Rs. 34.54 million. Loans from rural banks in 1974 = (260 × 98 × 243) = Rs. 6.19 million. Hence, total amount of loans = (34.54 + 6.19) = Rs. 40.73 million. Hence, percentage of agricultural loans

$$= \frac{34.54}{40.73} = 84.79\% = 85\% \text{ (Approximately)}$$

179.

Year	No. of rural banks	Average no. of loans	Total no. of loans
1970	90	28	2520
1971	115	39	4485
1972	130	52	6760
1974	260	98	25480
1975	318	121	38478
1980	605	288	174240
1981	665	312	207480
1983	840	380	319200

So total number of loans up to 1980 = (2520 + 4485 + 6760 + 25480 + 38478 + 174240) = 251963

And the total number of rural loans in 1983 = 319200

$$\text{Hence, } \frac{251963}{319200} = 78.93\% = 80\% \text{ (Approximately).}$$

180.

Year	Total no. of loans	Increase
1970	2520	-
1971	4485	1965
1972	6760	2275
1974	25480	18720
1975	38478	12998
1980	174240	-
1981	207480	33240
1983	319200	-

Thus, we find that the maximum increase in the number of loans for rural banks is in 1980-81.

**Note:** Students please note that we have not calculated the increase for 1970, 1980 and 1983 as their previous years' figure is not known.

181. The value of agricultural loan in 1983 is Rs. 915.7 million. But this at consumer price index (CPI) = 149. So if we want this value at 1970 CPI, viz. 43, it would simply be

$$\frac{43 \times 915.7}{149} = 264.26.$$

182. Students please note that what they are really asking is for which year the average number of loans is the least, and we can see in 1970.

183. From 1970 to 1983, in 13 years the number of agricultural loans went up from 18,300 to 2,11,600, an increase of 1,93,300. So percentage increase in this

$$= \frac{193300}{18300} = 1057. \text{ However, this growth is spread across 13 years. Hence, simple annual rate of increase} = \frac{1057}{13} = 81.3\% = 81 \text{ (Approximately).}$$

184. The CPI in 1970 is 43. But it has to be taken as 105. Presently in 1983 and 1975, the CPI is 149 and 78 respectively. Hence, they should actually be taken as

$$\left(149 \times \frac{105}{43}\right) = 363.83 \text{ and } \left(78 \times \frac{105}{43}\right) = 190.46$$

respectively. Hence, their difference  
=  $(363.83 - 190.46) = 173.37 = 174$  (Approximately).

185. Total value of loans  
= Rural bank loans + Agricultural loans.  
Rural bank loan in 1980 =  $(605 \times 288 \times 567)$   
= Rs. 98.79 million. Total value of agricultural loan in  
1980 = Rs. 498.4 million.  
Hence, total loans in 1980  
=  $(98.79 + 498.4) = 597.19$ .  
But this is at a CPI = 131  
If it is to be calculated at 1983 CPI, viz. 149, then its

$$\text{value will be } 597.19 \times \left(\frac{149}{131}\right) = \text{Rs. } 679.24 \text{ million}$$

= Rs. 680 million (Approximately).