Bodhee prep

Question Paper with Solutions

CAT 2002

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CAT 2002 Actual Paper

Instructions:

1. The Test Paper contains 150 questions. The duration of the test is 120 minutes.
2. The paper is divided into three sections. Section-I: 50 Q:, Section-II: 50 Q:, Section-III: 50 Q.
3. Wrong answers carry negative marks. There is only one correct answer for each question.

Section – I

Directions for questions 1 to 6: Answer the questions independently.
Four students — Ashish, Dhanraj, Felix and Sameer sat for the Common Entrance Exam for Management (CEEM). One student got admission offers from three NIMs (National Institutes of Management), another from two NIMs, the third from one NIM, while the fourth got none. Below are some of the facts about who got admission offers from how many NIMs and what is their educational background.

I. The one who is an engineer didn't get as many admissions as Ashish.
II. The one who got offer for admissions in two NIMs isn't Dhanraj nor is he a chartered accountant.
III. Sameer is an economist.
IV. Dhanraj isn't an engineer and received more admission offers than Ashish.
V. The doctor got the most number of admission offers.

1. Which one of the following statements is necessarily true?
   1. Ashish is a chartered accountant and got offer for admission in three NIMs.
   2. Dhanraj is a doctor and got admission offer in one NIM.
   3. Sameer is an economist who got admission offers in two NIMs.
   4. Felix who is not an engineer did not get any offer for admission.

2. Five boys went to a store to buy sweets. One boy had Rs. 40. Another boy had Rs. 30. Two other boys had Rs. 20 each. The remaining boy had Rs. 10. Below are some more facts about the initial and final cash positions.
   I. Alam started with more than Jugraj.
   II. Sandeep spent Rs. 1.50 more than Daljeet.
   III. Ganesh started with more money than just only one other person.
   IV. Daljeet started with $\frac{2}{3}$ of what Sandeep started with.
   V. Alam spent the most, but did not end with the least.
   VI. Jugraj spent the least and ended with more than Alam or Daljeet.
   VII. Ganesh spent Rs.3.50.
   VIII. Alam spent 10 times more than what Ganesh did.

   In the choices given below, all statements except one are false. Which one of the following statements can be true?
   1. Alam started with Rs. 40 and ended with Rs. 9.50
   2. Sandeep started with Rs. 30 and ended with Re. 1
   3. Ganesh started with Rs. 20 and ended with Rs. 4
   4. Jugraj started with Rs. 10 and ended with Rs. 7

3. In a hospital there were 200 diabetes, 150 hyperglycaemia and 150 gastro-enteritis patients. Of these, 80 patients were treated for both diabetices and hyperglycaemia. Sixty patients were treated for gastro-enteritis and hyperglycaemia, while 70 were treated for diabetes and gastro-enteritis. Some of these patients have all the three diseases. Dr. Dennis treats patients with only gastro-enteritis. Dr. Paul is a generalist. Therefore, he can treat patients with multiple diseases. Patients always prefer a specialist for their disease. If Dr. Dennis had 80 patients, then the other three doctors can be arranged in terms of the number of patients treated as:

1. Paul > Gerard > Hormis
2. Paul > Hormis > Gerard
3. Gerard > Paul > Hormis
4. None of these

4. Three children won the prizes in the Bournvita Quiz contest. They are from the schools: Loyola, Convent and Little Flowers, which are located at different cities. Below are some of the facts about the schools, the children and the city they are from.

I. One of the children is Bipin.
II. Loyola School's contestant did not come first.
III. Little Flower's contestant was named Riaz.
IV. Convent School is not in Hyderabad.
V. The contestant from Pune is not from Loyola School.
VI. The contestant from Bangalore did not come first.
VII. Convent School's contestant's name is not Balbir.

Which of the following statements is true?

1. 1st prize: Riaz (Little Flowers), 2nd prize: Bipin (Convent), 3rd prize: Balbir (Loyola)
2. 1st prize: Bipin (Convent), 2nd prize: Riaz (Little Flowers), 3rd prize: Balbir (Loyola)
3. 1st prize: Riaz (Little Flowers), 2nd prize: Balbir (Loyola), 3rd prize: Bipin (Convent)
4. 1st prize: Bipin (Convent), 2nd prize: Balbir (Loyola), 3rd prize: Riaz (Litttle Flowers)

5. Two boys are playing on a ground. Both the boys are less than 10 years old. Age of the younger boy is equal to the cube root of the product of the age of the two boys. If we place the digit representing the age of the younger boy to the left of the digit representing the age of the elder boy, we get the age of father of the younger boy. Similarly, if we place the digit representing the age of the elder boy to the left of the digit representing the age of the younger boy and divide the figure by 2, we get the age of mother of the younger boy. The mother of the younger boy is younger to his father by 3 years. Then, what is the age of the younger boy?

1. 3
2. 4
3. 2
4. None of these

6. Flights A and B are scheduled from an airport within the next one hour. All the booked passengers of the two flights are waiting in the boarding hall after check-in. The hall has a seating capacity of 200, out of which 10% remained vacant. 40% of the waiting passengers are ladies. When boarding announcement came, passengers of flight A left the hall and boarded the flight. Seating capacity of each flight is two-third of the passengers who waited in the waiting hall for both the flights put together. Half the passengers who boarded flight A are women. After boarding for flight A, 60% of the waiting hall seats became empty. For every twenty of those who are still waiting in the hall for flight B, there is one air hostess in flight A. What is the ratio of empty seats in flight B to the number of air hostesses in flight A?

1. 10 : 1
2. 5 : 1
3. 20 : 1
4. 1 : 1

Directions for questions 7 to 10: Answer the questions based on the information given below.
A country has the following types of traffic signals.
3 red lights = stop
2 red lights = turn left
1 red light = turn right
3 green lights = go at 100 km/hr speed
2 green lights = go at 40 km/hr speed
1 green light = go at 20 km/hr speed
A motorist starts at a point on a road and follows all traffic signals. His car is heading towards the north. He encounters the following signals (the time mentioned in each case below is applicable after crossing the previous signal).
Starting point - 1 green light
After half an hour, 1st signal - 2 red and 2 green lights
After 15 min, 2nd signal - 1 red light
After half an hour, 3rd signal - 1 red and 3 green lights
After 24 min, 4th signal - 2 red and 2 green lights
After 15 min, 5th signal - 3 red lights

7. The total distance travelled by the motorist from the starting point till the last signal is
   1. 90 km 2. 100 km 3. 120 km 4. None of these

8. What is the position (radial distance) of the most motorist when he reaches the last signal?
   1. 45 km directly north of the starting point
   2. 30 km directly to the east of the starting point
   3. 50 km away to the north-east of the starting point
   4. 45 km away to the north-west of the starting point

9. After the starting point if the 1st signal were 1 red and 2 green lights, what would be the final position of the motorist?
   1. 30 km to the west and 20 km to the south 2. 30 km to the west and 40 km to the north
   3. 50 km to the east and 40 km to the north 4. Directly 30 km to the east

10. If at the starting point, the car was heading towards south, what would be the final position of the motorist?
   1. 30 km to the east and 40 km to the south 2. 50 km to the east and 40 km to the south
   3. 30 km to the west and 40 km to the south 4. 50 km to the west and 20 km to the north

Directions for questions 11 to 13: Answer these questions based on the table given below.
The following table provides data on the different countries and location of their capitals. (the data may not match the actual Latitude, Longitudes) Answer the following questions on the basis of this table.

S.No.	Country	Capital	Latitude	Longitude
1	Argentina	Buenos Aires	34.30 S	58.20 E
2	Australia	Canberra	35.15 S	149.08 E
3	Austria	Vienna	48.12 N	16.22 E
4	Bulgaria	Sofia	42.45 N	23.20 E
5	Brazil	Brasilia	15.47 S	47.55 E
6	Canada	Ottawa	45.27 N	75.42 E
7	Cambodia	Phnom Penh	11.33 N	104.55 E
8	Equador	Quito	0.15 S	78.35 E
9	Ghana	Accra	5.35 N	0.60 E
10	Iran	Teheran	35.44 N	51.30 E
11	Ireland	Dublin	53.20 N	6.18 E
12	Libya	Tripoli	32.49 N	13.07 E
13	Malaysia	Kuala Lumpur	3.90 N	101.41 E
14	Peru	Lima	12.05 S	77.0 E
15	Poland	Warsaw	52.13 N	21.0 E
16	New Zealand	Wellington	41.17 S	174.47 E
17	Saudi Arabia	Riyadh	24.41 N	46.42 E
18	Spain	Madrid	40.25 N	3.45 W
19	Sri Lanka	Colombo	6.56 N	79.58 E
20	Zambia	Lusaka	15.28 S	28.16 E

11. What percentage of cities located within 10°E and 40°E (20° East and 40° East) lie in the Southern Hemisphere?
    1. 15% 2. 20% 3. 25% 4. 30%

12. The number of cities whose names begin with a consonant and are in the Northern Hemisphere in the table
    1. exceeds the number of cities whose names begin with a consonant and are in the southern hemisphere by 1.
    2. exceeds the number of cities whose names begin with a consonant and are in the southern hemisphere by 2.
    3. is less than the number of cities whose names begin with a consonant and are in the east of the meridian by 1.
    4. is less than the number of countries whose name begins with a consonant and are in the east of the meridian by 3.

13. The ratio of the number of countries whose name starts with vowels and located in the southern hemisphere, to the number of countries, the name of whose capital cities starts with a vowel in the table above is
    1. 3 : 2 2. 3 : 3 3. 3 : 1 4. 4 : 3

Directions for questions 14 to 21: Each item is followed by two statements, A and B. Answer each question using the following instructions.

Choose 1 if the question can be answered by one of the statements alone but not by the other.
Choose 2 if the question can be answered by using either statement alone.
Choose 3 if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.
Choose 4 if the question cannot be answered even by using both statements together.

14. In a hockey match, the Indian team was behind by 2 goals with 5 min remaining. Did they win the match?
    A. Deepak Thakur, the Indian striker, scored 3 goals in the last 5 min of the match.
    B. Korea scored a total of 3 goals in the match.
    1. 1 2. 2 3. 3 4. 4

15. Four students were added to a dance class. Would the teacher be able to divide her students evenly into a dance team (or teams) of 8?
    A. If 12 students were added, the teacher could put everyone in teams of 8 without any leftovers.
    B. The number of students in the class is currently not divisible by 8.
    1. 1 2. 2 3. 3 4. 4

16. Is x = y?
    A. $(x + y)\left(\frac{1}{x} + \frac{1}{y}\right) = 4$
    B. $(x - 50)^2 = (y - 50)^2$
    1. 1 2. 4 3. 3 4. 4

17. A dress was initially listed at a price that would have given the store a profit of 20% of the wholesale cost. What was the wholesale cost of the dress?
    A. After reducing the listed price by 10%, the dress sold for a net profit of $10.
    B. The dress is sold for $50.
    1. 1 2. 2 3. 3 4. 4

18. Is 500 the average (arithmetic mean) score in the GMAT?
    A. Half of the people who take the GMAT score above 500 and half of the people score below 500.
    B. The highest GMAT score is 800 and the lowest score is 200.
    1. 1 2. 2 3. 3 4. 4

19. Is $|x - 2| < 1$?
    A. $|x| < 1$
    B. $|x - 1| < 2$
    1. 2 2. 1 3. 3 4. 4

20. People in a club either speak French or Russian or both. Find the number of people in a club who speak only French.
    A. There are 300 people in the club and the number of people who speak both French and Russian is 196.
    B. The number of people who speak only Russian is 58.
    1. 1 2. 2 3. 3 4. 4

21. A sum of Rs. 38,500 was divided among Jagdish, Punit and Girish. Who received the minimum amount?

A. Jadgish received $\frac{2}{9}$ of what Punit and Girish received together.

B. Punit received $\frac{3}{11}$ of what Jadgish and Girish received together.

1. 1 2. 2 3. 3 4. 4

Directions for questions 22 to 25: Answer the questions based on the following information.
The following table gives details regarding the total earnings of 15 employees and the number of days they have worked on complex, medium and simple operation in the month of June 2002. Even though the employees might have worked on an operation, they would be eligible for earnings only if they have minimum level of efficiency.

	Total Earnings				Total Days			
Emp. No	Complex	Medium	Simple	Total	Complex	Medium	Simple	Total
2001147	82.98		636.53	719.51	3.00	0.00	23.00	26.00
2001148	51.53		461.73	513.26	3.33	1.67	16.00	21.00
2001149	171.1		79.10	250.81	5.50	4.00	8.50	18.00
2001150	100.47		497.47	597.95	6.00	4.67	7.33	18.00
2001151	594.43	159.64		754.06	9.67	13.33	0.00	23.00
2001156	89.70			89.70	8.00	0.00	1.00	9.00
2001158	472.31	109.73		582.04	1.39	9.61	0.00	11.00
2001164	402.25	735.22	213.67	1351.14	5.27	12.07	0.67	18.00
2001170	576.57			576.57	21.00	0.00	0.00	21.00
2001171	286.48	6.10		292.57	8.38	4.25	0.38	13.00
2001172	512.10	117.46		629.56	10.00	8.50	3.50	22.00
2001173	1303.88			1303.88	25.50	0.00	0.50	26.00
2001174	1017.94			1017.90	26.00	0.00	0.00	26.00
2001179	46.56	776.19		822.75	2.00	19.00	0.00	21.00
2001180	116.40	1262.79		1379.19	5.00	19.00	0.00	24.00

22. The number of employees who have earned more than Rs. 50 per day in complex operations is
1. 4 2. 3 3. 5 4. 6

23. The number of employees who have earned more than Rs. 600 and having more than 80% attendance (there are 25 regular working days in June 2002; some might be coming on overtime too) is
1. 4 2. 5 3. 6 4. 7

24. The employee number of the person who has earned the maximum earnings per day in medium operation is
1. 2001180 2. 2001164 3. 2001172 4. 2001179

25. Among the employees who were engaged in complex and medium operations, the number of employees whose average earning per day in complex operations is more than average earning per day in medium operations is
1. 2 2. 3 3. 5 4. 7

Directions for questions 26 to 33: Answer the questions based on the table given below:

The following table shows the revenue and expenses in millions of Euros (European currency) associated with REPSOL YPF company's oil and gas producing activities in operations in different parts of the world for 1998-2000.

REPSOL YPF'S Operations of Oil and Gas Producing Activities

S. No.	Item	Year	Total World	Spain	North Africa & Middle East	Argentina	Rest of Latin America	Far East	North Sea	Rest of the World
1	Revenue	1998	916	70	366	281	34	82	78	5
		1999	3374	55	666	2006	115	301	140	91
		2000	8328	394	1290	5539	482	603	0	20
2	Expenses	1998	668	39	255	187	57	63	52	15
		1999	1999	48	325	1168	131	204	65	58
		2000	3709	43	530	2540	252	311	0	33
3	Income before Taxes & Charges (Revenue-Expenses) =[(1)-(2)]	1998	248	31	111	94	–23	19	26	–10
		1999	1375	7	341	838	–16	97	75	33
		2000	4619	351	760	2999	230	292	0	–13
4	Taxes & Charges	1998	152	6	104	33	–3	9	6	–3
		1999	561	3	169	338	–6	39	21	–3
		2000	1845	126	404	1150	61	103	0	1
5	Net Income Taxes Charges [=(3)-(4)]	1998	96	25	7	61	–20	10	20	–7
		1999	814	4	172	500	–10	58	54	36
		2000	2774	225	356	1849	169	189	0	–14

26. How many operations (Spain, North Africa and Middle East,..) of the company accounted for less than 5% of the total revenue earned in 1999?
1. 2 2. 3 3. 4 4. None of these

27. How many operations (Spain, North Africa and Middle East…) of the company witnessed more than 200% revenue from 1999 to 2000?
1. 1 2. 2 3. 3 4. None of these

28. How many operations registered a sustained yearly increase in income before taxes and charges from 1998 to 2000?
1. 3 2. 4 3. 5 4. None of these

29. Ignoring the loss making operations of the company in 1998, for how many operations was the percentage increase in net income before taxes and charges higher than the average from 1998 to 1999?
1. 0 2. 1 3. 2 4. None of these

30. If profitability is defined as the ratio of net income after taxes and charges to expense, which of the following statements is true?
1. The Far East operations witnessed its highest profitability in 1998.
2. The North Sea operations increased its profitability from 1998 to 1999.
3. The operations in Argentina witnessed a decrease in profitability from 1998 to 1999.
4. Both 2 and 3 are true.

31. In 2000, which among the following countries had the best profitability?
1. North Africa and Middle East 2. Spain
3. Rest of Latin America 4. Far East

32. If efficiency is defined as the ratio of revenue to expenses, which operation was the least efficient in 2000?
1. Spain 2. Argentina 3. Far East 4. None of these

33. Of the following statements, which one is not true?
1. The operations in Spain had the best efficiency in 2000
2. The Far East operations witnessed an efficiency improvement from 1999 to 2000
3. The North Sea operations witnessed an efficiency improvement from 1998 to 1999
4. In 1998, the operations in Rest of Latin America were the least efficient

Directions for questions 34 and 35: Answer the questions based on the pie charts given below.

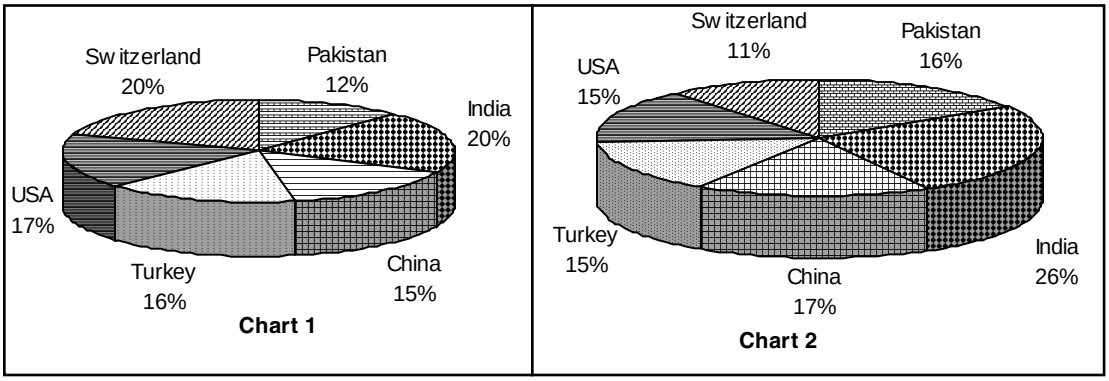


Chart 1 shows the distribution by value of top 6 suppliers of MFA Textiles in 1995. Chart 2 shows the distribution by quantity of top 6 suppliers of MFA Textiles in 1995. The total value is 5760 million Euro (European currency). The total quantity is 1.055 million tonnes.

34. The country which has the highest average price is
1. USA 2. Switzerland 3. Turkey 4. India

35. The average price in Euro per kilogram for Turkey is roughly
1. 6.20 2. 5.60 3. 4.20 4. 4.80

Directions for questions 36 to 41: Answer these questions based on the tables given below:

There are 6 refineries, 7 depots and 9 districts. The refineries are BB, BC, BD, BE, BF and BG. The depots are AA, AB, AC, AD, AE, AF and AG. The districts are AAA, AAB, AAC, AAD, AAE, AAF, AAG, AAH, and AAI. Table A gives the cost of transporting one unit from refinery to depot. Table B gives the cost of transporting one unit from depot to a district.

Table A

	BB	BC	BD	BE	BF	BG
AA	928.2	537.2	567.8	589.9	589.9	800.1
AB	311.1	596.7	885.7	759.9	759.9	793.9
AC	451.1	0	320.1	780.1	720.7	1000.1
AD	371.1	150.1	350.1	750.1	650.4	980.1
AE	1137.3	314.5	0	1157.7	1157.7	1023.4
AF	617.1	516.8	756.5	1065.9	1065.9	406.3
AG	644.3	299.2	537.2	1093.1	1093.1	623.9

Table B

	AA	AB	AC	AD	AE	AF	AG
AAA	562.7	843.2	314.5	889.1	0	754.8	537.2
AAB	532.7	803.2	284.5	790.5	95.2	659.6	442
AAC	500.7	780.2	0	457.3	205.7	549.1	331.5
AAD	232.9	362.1	286.2	275.4	523.6	525.3	673.2
AAE	345.1	268.6	316.2	163.2	555.9	413.1	227.8
AAF	450.1	644.3	346.2	372.3	933.3	402.9	379.1
AAG	654.5	0	596.7	222.7	885.7	387.6	348.5
AAH	804.1	149.6	627.2	360.4	1035.3	537.2	498.1
AAI	646	255	433.5	137.7	698.7	112.2	161.5

36. What is the least cost of sending one unit from any refinery to any district?
1. 95.2 2. 0 3. 205.7 4. 284.5

37. What is the least cost of sending one unit from any refinery to the district AAB?
1. 0 2. 284.5 3. 95.2 4. None of these

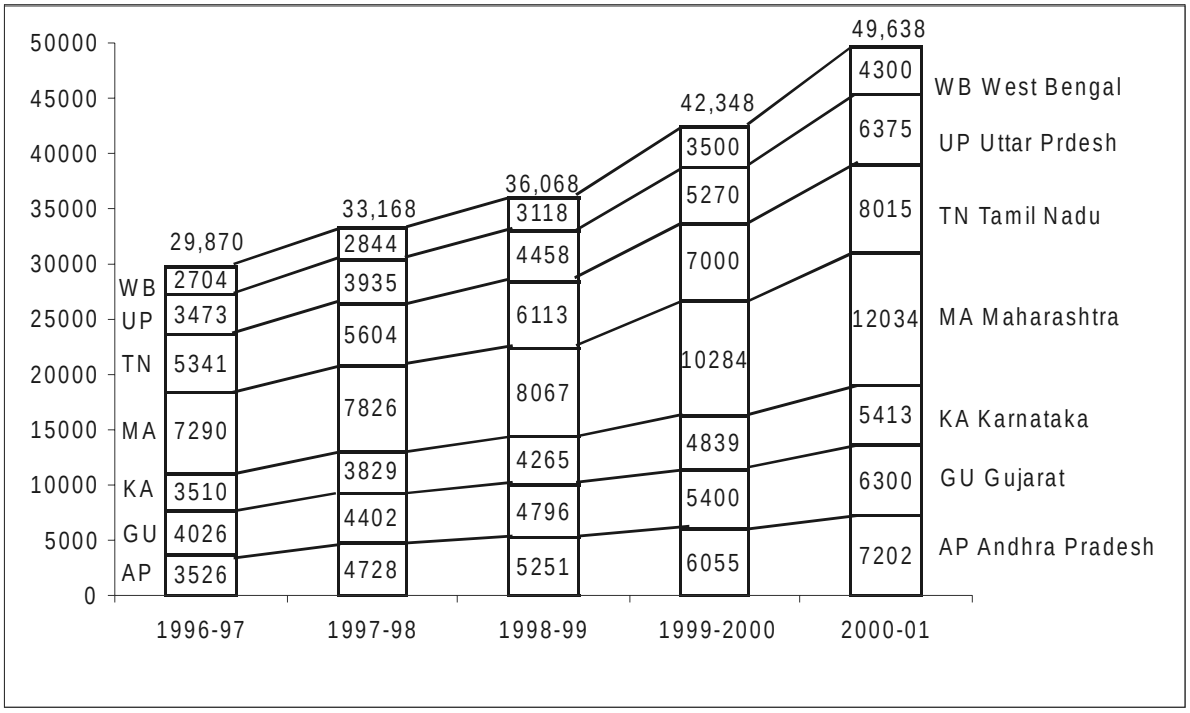
38. What is the least cost of sending one unit from refinery BB to any district?
1. 284.5 2. 311.1 3. 451.1 4. None of these

39. What is the least cost of sending petrol from refinery BB to district AAA?
1. 765.6 2. 1137.3 3. 1154.3 4. None of these

40. How many possible ways are there for sending petrol from any refinery to any district?
1. 63 2. 42 3. 54 4. 378

41. The largest cost of sending petrol from any refinery to any district is
1. 2172.6 2. 2193.0 3. 2091.0 4. None of these

Directions for questions 42 to 47: Answer the questions based on the chart given below.
The chart given below indicates the annual sales tax revenue collections (in rupees in crores) of seven states from 1997 to 2001. The values given at the top of each bar represents the total collections in that year.



42. If for each year, the states are ranked in terms of the descending order of sales tax collections, how many states do not change the ranking more than once over the five years?
1. 1 2. 5 3. 3 4. 4

43. Which of the following states has changed its relative ranking most number of times when you rank the states in terms of the descending volume of sales tax collections each year?
1. Andhra Pradesh 2. Uttar Pradesh 3. Karnataka 4. Tamil Nadu

44. The percentage share of sales tax revenue of which state has increased from 1997 to 2001?
1. Tamil Nadu 2. Karnataka 3. Gujarat 4. Andhra Pradesh

45. Which pair of successive years shows the maximum growth rate of tax revenue in Maharashtra?
1. 1997 to 1998 2. 1998 to 1999 3. 1999 to 2000 4. 2000 to 2001

46. Identify the state whose tax revenue increased exactly by the same amount in two successive pair of years?
1. Karnataka 2. West Bengal 3. Uttar Pradesh 4. Tamil Nadu

47. Which state below has been maintaining a constant rank over the years in terms of its contribution to total tax collections?
1. Andhra Pradesh 2. Karnataka 3. Tamil Nadu 4. Uttar Pradesh

Directions for questions 48 to 50: Answer the questions based on the table given below.
The table below gives information about four different crops, their different quality, categories and the regions where they are cultivated. Based on the information given in the table answer the questions below.

Type of Crop	Quality	Region
Crop - 1	High	R1, R2, R3, R4, R5
	Medium	R6, R7, R8
	Low	R9, R10, R11
Crop - 2	High	R5, R8, R12
	Medium	R9, R13
	Low	R6, R7, R8
Crop - 3	High	R2, R6, R7. R13
	Medium	R3, R9, R11
	Low	R1, R4
Crop - 4	High	R3, R10, R11
	Medium	R1, R2, R4
	Low	R5, R9

48. How many regions produce medium qualities of Crop-1 or Crop-2 and also produce low quality of Crop-3 or Crop-4?
1. Zero 2. One 3. Two 4. Three

49. Which of the following statements is true?
1. All medium quality Crop-2 producing regions are also high quality Crop-3 producing regions.
2. All high quality Crop-1 producing regions are also medium and low Crop-4 producing regions.
3. There are exactly four Crop-3 producing regions, which also produce Crop-4 but not Crop-2.
4. Some Crop-3 producing regions produce Crop-1, but not high quality Crop-2.

50. How many low quality Crop-1 producing regions are either high quality Crop-4 producing regions or medium quality Crop-3 producing regions?
1. One 2. Two 3. Three 4. Zero

Section – II

51. If there are 10 positive real numbers $n_1 < n_2 < n_3 ... < n_{10}$, how many triplets of these numbers (n_1, n_2, n_3), (n_2, n_3, n_4), ... can be generated such that in each triplet the first number is always less than the second number, and the second number is always less than the third number?

1. 45 2. 90 3. 120 4. 180

52. In ΔABC, the internal bisector of $\angle A$ meets BC at D. If AB = 4, AC = 3 and $\angle A = 60^\circ$, then the length of AD is

1. $2\sqrt{3}$ 2. $\frac{12\sqrt{3}}{7}$ 3. $\frac{15\sqrt{3}}{8}$ 4. $\frac{6\sqrt{3}}{7}$

53. The length of the common chord of two circles of radii 15 cm and 20 cm, whose centres are 25 cm apart, is

1. 24 cm 2. 25 cm 3. 15 cm 4. 20 cm

54. If $f(x) = \log\left\{\frac{(1+x)}{(1-x)}\right\}$, then f(x) + f(y) is

1. f(x + y) 2. $f\left\{\frac{(x+y)}{(1+xy)}\right\}$ 3. $(x+y)f\left\{\frac{1}{(1+xy)}\right\}$ 4. $\frac{f(x)+f(y)}{(1+xy)}$

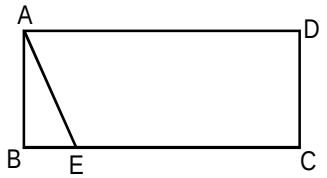
55. Four horses are tethered at four corners of a square plot of side 14 m so that the adjacent horses can just reach one another. There is a small circular pond of area 20 m^2 at the centre. Find the ungrazed area.

1. 22 m^2 2. 42 m^2 3. 84 m^2 4. 168 m^2

56. On a straight road XY, 100 m long, five heavy stones are placed 2 m apart beginning at the end X. A worker, starting at X, has to transport all the stones to Y, by carrying only one stone at a time. The minimum distance he has to travel is

1. 472 m 2. 422 m 3. 744 m 4. 860 m

57. In the figure given below, ABCD is a rectangle. The area of the isosceles right triangle ABE = 7 cm^2 ; EC = 3(BE). The area of ABCD (in cm^2) is



1. 21 cm^2 2. 28 cm^2 3. 42 cm^2 4. 56 cm^2

58. The area of the triangle whose vertices are (a, a), (a + 1, a + 1) and (a + 2, a) is

1. a^3 2. 1 3. 2a 4. $2^{1/2}$

59. Instead of walking along two adjacent sides of a rectangular field, a boy took a short cut along the diagonal and saved a distance equal to half the longer side. Then the ratio of the shorter side to the longer side is

1. $\frac{1}{2}$ 2. $\frac{2}{3}$ 3. $\frac{1}{4}$ 4. $\frac{3}{4}$

60. Only a single rail track exists between stations A and B on a railway line. One hour after the north-bound super fast train N leaves station A for station B, a south-bound passenger train S reaches station A from station B. The speed of the super fast train is twice that of a normal express train E, while the speed of a passenger train S is half that of E. On a particular day, N leaves for B from A, 20 min behind the normal schedule. In order to maintain the schedule, both N and S increased their speeds. If the super fast train doubles its speed, what should be the ratio (approximately) of the speeds of passenger train to that of the super fast train so that the passenger train S reaches exactly at the scheduled time at A on that day?

1. 1 : 3 2. 1 : 4 3. 1 : 5 4. 1 : 6

61. On a 20 km tunnel, connecting two cities A and B, there are three gutters (1, 2 and 3). The distance between gutters 1 and 2 is half the distance between gutters 2 and 3. The distance from city A to its nearest gutter, gutter 1, is equal to the distance of city B from gutter 3. On a particular day, the hospital in city A receives information that an accident has happened at gutter 3. The victim can be saved only if an operation is started within 40 min. An ambulance started from city A at 30 km/hr and crossed gutter 1 after 5 min. If the driver had doubled the speed after that, what is the maximum amount of time would the doctor get to attend the patient at the hospital. Assume 1 min is elapsed for taking the patient into and out of the ambulance?

1. 4 min
2. 2.5 min
3. 1.5 min
4. The patient died before reaching the hospital

62. Number S is obtained by squaring the sum of digits of a two-digit number D. If difference between S and D is 27, then the two-digit number D is

1. 24 2. 54 3. 34 4. 45

63. The nth element of a series is represented as

$X_n = (-1)^n X_{n-1}$

If $X_0 = x$ and $x > 0$, then which of the following is always true?

1. X_n is positive if n is even
2. X_n is positive if n is odd
3. X_n is negative if n is even
4. None of these

64. If x, y and z are real numbers such that $x + y + z = 5$ and $xy + yz + zx = 3$, what is the largest value that x can have?

1. $\frac{5}{3}$ 2. $\sqrt{19}$ 3. $\frac{13}{3}$ 4. None of these

65. Neeraj has agreed to mow a lawn, which is a 20 m × 40 m rectangle. He mows it with 1 m wide strip. If Neeraj starts at one corner and mows around the lawn toward the centre, about how many times would he go round before he has mowed half the lawn?

1. 2.5 2. 3.5 3. 3.8 4. 4

66. The owner of a local jewellery store hired three watchmen to guard his diamonds, but a thief still got in and stole some diamonds. On the way out, the thief met each watchman, one at a time. To each he gave $\frac{1}{2}$ of the diamonds he had then, and 2 more besides. He escaped with one diamond. How many did he steal originally?

1. 40 2. 36 3. 25 4. None of these

67. Mayank, Mirza, Little and Jaspal bought a motorbike for $60. Mayank paid one-half of the sum of the amounts paid by the other boys. Mirza pad one-third of the sum of the amounts paid by the other boys. Little paid one-fourth of the sum of the amounts paid by the other boys. How much did Jaspal have to pay?

1. $15 2. $13 3. $17 4. None of these

68. A rich merchant had collected many gold coins. He did not want anybody to know about him. One day, his wife asked, " How many gold coins do we have?" After a brief pause, he replied, "Well! if I divide the coins into two unequal numbers, then 48 times the difference between the two numbers equals the difference between the squares of the two numbers." The wife looked puzzled. Can you help the merchant's wife by finding out how many gold coins the merchant has?

1. 96 2. 53 3. 43 4. None of these

69. Shyam visited Ram during his brief vacation. In the mornings they both would go for yoga. In the evenings they would play tennis. To have more fun, they indulge only in one activity per day, i.e. either they went for yoga or played tennis each day. There were days when they were lazy and stayed home all day long. There were 24 mornings when they did nothing, 14 evenings when they stayed at home, and a total of 22 days when they did yoga or played tennis. For how many days Shyam stayed with Ram?

1. 32 2. 24 3. 30 4. None of these

70. Let S denotes the infinite sum $2+5x+9x^2+14x^3+20x^4+\ldots$, where |x| < 1 and the coefficient of x^{n-1} is $\frac{1}{2}n(n+3),(n=1,\ 2,\ \ldots)$. Then S equals:

1. $\frac{2-x}{(1\ -x)^3}$ 2. $\frac{2-x}{(1\ +x)^3}$ 3. $\frac{2+x}{(1\ -x)^3}$ 4. $\frac{2+x}{(1\ +x)^3}$

71. If $x^2+5y^2+z^2=2y(2x+z)$, then which of the following statements is(are) necessarily true?

A. x = 2y B. x = 2z C. 2x = z

1. Only A 2. B and C 3. A and B 4. None of these

72. Amol was asked to calculate the arithmetic mean of 10 positive integers, each of which had 2 digits. By mistake, he interchanged the 2 digits, say a and b, in one of these 10 integers. As a result, his answer for the arithmetic mean was 1.8 more than what it should have been. Then b – a equals

1. 1 2. 2 3. 3 4. None of these

73. A car rental agency has the following terms. If a car is rented for 5 hr or less, then, the charge is Rs. 60 per hour or Rs. 12 per kilometre whichever is more. On the other hand, if the car is rented for more than 5 hr, the charge is Rs. 50 per hour or Rs. 7.50 per kilometre whichever is more. Akil rented a car from this agency, drove it for 30 km and ended up playing Rs. 300. For how many hours did he rent the car?

1. 4 hr 2. 5 hr 3. 6 hr 4. None of these

74. A child was asked to add first few natural numbers (i.e. 1 + 2 + 3 + …) so long his patience permitted. As he stopped, he gave the sum as 575. When the teacher declared the result wrong, the child discovered he had missed one number in the sequence during addition. The number he missed was

1. less than 10 2. 10 3. 15 4. more than 15

75. Suppose for any real number x, [x] denotes the greatest integer less than or equal to x. Let L(x, y) = [x] + [y] + [x + y] and R(x, y) = [2x] + [2y]. Then it is impossible to find any two positive real numbers x and y for which

1. L(x, y) = R(x, y) 2. L(x, y) $\neq$ R(x, y) 3. L(x, y) < R(x, y) 4. L(x, y) > R(x, y)

76. Ten straight lines, no two of which are parallel and no three of which pass through any common point, are drawn on a plane. The total number of regions (including finite and infinite regions) into which the plane would be divided by the lines is

1. 56 2. 255 3. 1024 4. not unique

77. When 2^{256} is divided by 17, the remainder would be

1. 1 2. 16 3. 14 4. None of these

78. The number of real roots of the equation $\frac{A^2}{x} + \frac{B^2}{x-1} = 1$, where A and B are real numbers not equal to zero simultaneously, is

1. None 2. 1 3. 2 4. 1 or 2

79. At a bookstore, 'MODERN BOOK STORE' is flashed using neon lights. The words are individually flashed at the intervals of $2\frac{1}{2}$ s, $4\frac{1}{4}$ s and $5\frac{1}{8}$ s respectively, and each word is put off after a second. The least time after which the full name of the bookstore can be read again is

1. 49.5 s 2. 73.5 s 3. 1744.5 s 4. 855 s

80. Three pieces of cakes of weights $4\frac{1}{2}$ lb, $6\frac{3}{4}$ lb and $7\frac{1}{5}$ lb respectively are to be divided into parts of equal weight. Further, each part must be as heavy as possible. If one such part is served to each guest, then what is the maximum number of guests that could be entertained?
1. 54 2. 72 3. 20 4. None of these

81. After the division of a number successively by 3, 4 and 7, the remainders obtained are 2, 1 and 4 respectively. What will be the remainder if 84 divides the same number?
1. 80 2. 75 3. 41 4. 53

82. Six persons are playing a card game. Suresh is facing Raghubir who is to the left of Ajay and to the right of Pramod. Ajay is to the left of Dhiraj. Yogendra is to the left of Pramod. If Dhiraj exchanges his seat with Yogendra and Pramod exchanges with Raghubir, who will be sitting to the left of Dhiraj?
1. Yogendra 2. Raghubir 3. Suresh 4. Ajay

Directions for questions 83 and 84: Answer the questions based on the following information.
A boy is asked to put one mango in a basket when ordered 'One', one orange when ordered 'Two', one apple when ordered 'Three', and is asked to take out from the basket one mango and an orange when ordered 'Four'. A sequence of orders is given as:
1 2 3 3 2 1 4 2 3 1 4 2 2 3 3 1 4 1 1 3 2 3 4

83. How many total oranges were in the basket at the end of the above sequence?
1. 1 2. 4 3. 3 4. 2

84. How many total fruits will be in the basket at the end of the above order sequence?
1. 9 2. 8 3. 11 4. 10

Directions for questions 85 and 86: Answer the questions based on the following information.
Each of the 11 letters A, H, I, M, O, T, U, V, W, X and Z appears same when looked at in a mirror. They are called symmetric letters. Other letters in the alphabet are asymmetric letters.

85. How many four-letter computer passwords can be formed using only the symmetric letters (no repetition allowed)?
1. 7,920 2. 330 3. 14,640 4. 4,19,430

86. How many three-letter computer passwords can be formed (no repetition allowed) with at least one symmetric letter?
1. 990 2. 2,730 3. 12,870 4. 15,600

Directions for questions 87 to 96: Answer the questions independently.

87. A train approaches a tunnel AB. Inside the tunnel is a cat located at a point that is $\frac{3}{8}$ of the distance AB measured from the entrance A. When the train whistles the cat runs. If the cat moves to the entrance of the tunnel A, the train catches the cat exactly at the entrance. If the cat moves to the exit B, the train catches the cat at exactly the exit. The speed of the train is greater than the speed of the cat by what order?

1. 3 : 1 2. 4 :1 3. 5 : 1 4. None of these

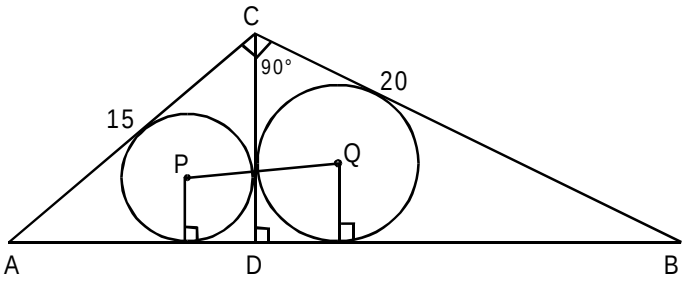
88. A piece of string is 40 cm long. It is cut into three pieces. The longest piece is three times as long as the middle-sized and the shortest piece is 23 cm shorter than the longest piece. Find the length of the shortest piece.

1. 27 2. 5 3. 4 4. 9

89. Three travellers are sitting around a fire, and are about to eat a meal. One of them has 5 small loaves of bread, the second has 3 small loaves of bread. The third has no food, but has 8 coins. He offers to pay for some bread. They agree to share the 8 loaves equally among the three travellers, and the third traveller will pay 8 coins for his share of the 8 loaves. All loaves were the same size. The second traveller (who had 3 loaves) suggests that he will be paid 3 coins, and that the first traveller be paid 5 coins. The first traveller says that he should get more than 5 coins. How much should the first traveller get?

1. 5 2. 7 3. 1 4. None of these

90.



In the above figure, ACB is a right-angled triangle. CD is the altitude. Circles are inscribed within the ΔACD and ΔBCD. P and Q are the centres of the circles. The distance PQ is

1. 5 2. $\sqrt{50}$ 3. 7 4. 8

91. If u, v, w and m are natural numbers such that $u^m + v^m = w^m$, then which one of the following is true?

1. $m \geq \min(u, v, w)$ 2. $m \geq \max(u, v, w)$
3. $m < \min(u, v, w)$ 4. None of these

92. In how many ways is it possible to choose a white square and a black square on a chessboard so that the squares must not lie in the same row or column?

1. 56 2. 896 3. 60 4. 768

93. $7^{6n} - 6^{6n}$, where n is an integer > 0, is divisible by

1. 13 2. 127 3. 559 4. All of these

94. If pqr = 1, the value of the expression $\frac{1}{1+p+q^{-1}} + \frac{1}{1+q+r^{-1}} + \frac{1}{1+r+p^{-1}}$ is equal to

1. p + q + r 2. $\frac{1}{p+q+r}$ 3. 1 4. $p^{-1} + q^{-1} + r^{-1}$

95. It takes six technicians a total of 10 hr to build a new server from Direct Computer, with each working at the same rate. If six technicians start to build the server at 11 am, and one technician per hour is added beginning at 5 pm, at what time will the server be completed?

1. 6.40 pm 2. 7 pm 3. 7.20 pm 4. 8 pm

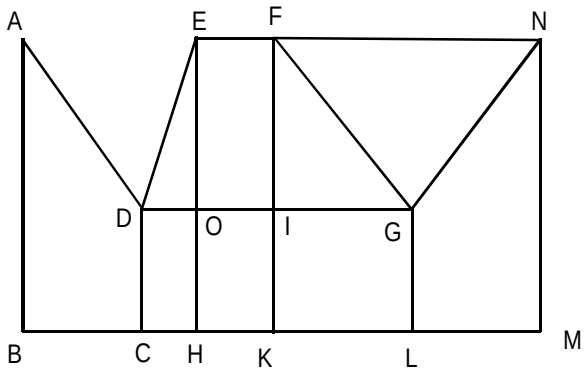
96. Davji Shop sells samosas in boxes of different sizes. The samosas are priced at Rs. 2 per samosa up to 200 samosas. For every additional 20 samosas, the price of the whole lot goes down by 10 paise per samosa. What should be the maximum size of the box that would maximise the revenue?

1. 240 2. 300 3. 400 4. None of these

97. Three small pumps and a large pump are filling a tank. Each of the three small pump works at $\frac{2}{3}$ the rate of the large pump. If all four pumps work at the same time, they should fill the tank in what fraction of the time that it would have taken the large pump alone?

1. $\frac{4}{7}$ 2. $\frac{1}{3}$ 3. $\frac{2}{3}$ 4. $\frac{3}{4}$

Directions for questions 98 and 100: Answer the questions based on the following diagram.



In the above diagram, $\angle ABC = 90° = \angle DCH = \angle DOE = \angle EHK = \angle FKL = \angle GLM = \angle LMN$
$AB = BC = 2CH = 2CD = EH = FK = 2HK = 4KL = 2LM = MN$

98. The magnitude of $\angle FGO =$
1. 30° 2. 45° 3. 60° 4. None of these

99. What is the ratio of the areas of the two quadrilaterals ABCD to DEFG?
1. 1 : 2 2. 2 : 1 3. 12 : 7 4. None of these

100. How many numbers greater than 0 and less than a million can be formed with the digits 0, 7 and 8?
1. 486 2. 1,084 3. 728 4. None of these

Section – III

Directions for questions 101 to 105: For the word given at the top of each table, match the dictionary definitions on the left (A, B, C, D) with their corresponding usage on the right (E, F, G, H). Out of the four possibilities given in the boxes below the table, select the one that has all the definitions and their usages most closely matched.

101. **Measure**

Dictionary definition		Usage	
A	Size or quantity found by measuring	**E**	A measure was instituted to prevent outsiders from entering the campus.
B	Vessel of standard capacity	**F**	Sheila was asked to measure each item that was delivered.
C	Suitable action	**G**	The measure of the cricket pitch was 22 yards.
D	Ascertain extent or quantity	**H**	Ramesh used a measure to take out one litre of oil.

1	
A	**H**
B	**F**
C	**E**
D	**G**

2	
A	**G**
B	**E**
C	**F**
D	**H**

3	
A	**G**
B	**H**
C	**E**
D	**F**

4	
A	**F**
B	**H**
C	**E**
D	**G**

102. **Bound**

Dictionary definition		Usage	
A	Obliged, constrained	**E**	Dinesh felt bound to walk out when the discussion turned to kickbacks.
B	Limiting value	**F**	Buffeted by contradictory forces he was bound to lose his mind.
C	Move in a specified direction	**G**	Vidya's story strains the bounds of credulity.
D	Destined or certain to be	**H**	Bound for a career in law, Jyoti was reluctant to study Milton.

1	
A	**F**
B	**H**
C	**G**
D	**E**

2	
A	**E**
B	**G**
C	**H**
D	**F**

3	
A	**E**
B	**H**
C	**F**
D	**G**

4	
A	**F**
B	**G**
C	**E**
D	**H**

103. **Catch**

Dictionary definition		Usage	
A	Capture	**E**	All her friends agreed that Prasad was a good catch.
B	Grasp with senses or mind	**F**	The proposal sounds very good but where is the catch?
C	Deception	**G**	Hussain tries to catch the spirit of India in this painting.
D	Thing or person worth trapping	**H**	Sorry, I couldn't catch you.

1	
A	**H**
B	**F**
C	**E**
D	**G**

2	
A	**F**
B	**G**
C	**E**
D	**H**

3	
A	**G**
B	**F**
C	**E**
D	**H**

4	
A	**G**
B	**H**
C	**F**
D	**E**

104. Deal

Dictionary definition		Usage	
A	Manage, attend to	**E**	Dinesh insisted on dealing the cards.
B	Stock, sell	**F**	This contract deals with handmade cards.
C	Give out to a number of people	**G**	My brother deals in cards.
D	Be concerned with	**H**	I decided not to deal with handmade cards.

1	
A	**F**
B	**E**
C	**G**
D	**H**

2	
A	**H**
B	**G**
C	**E**
D	**F**

3	
A	**F**
B	**H**
C	**G**
D	**E**

4	
A	**H**
B	**E**
C	**G**
D	**F**

105. **Turn**

Dictionary definition		Usage	
A	Give new direction to	**E**	It was now his turn to be angry.
B	Send	**F**	Leena never turned away a beggar.
C	Change in form	**G**	Ashish asked Laxman to turn his face to the left.
D	Opportunity coming successively for each person	**H**	The old school building has been turned into a museum.

1	
A	**H**
B	**E**
C	**F**
D	**G**

2	
A	**G**
B	**F**
C	**E**
D	**H**

3	
A	**G**
B	**E**
C	**F**
D	**H**

4	
A	**G**
B	**F**
C	**H**
D	**E**

Directions for questions 101 to 105: The sentences given in each question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.

106. A. Branded disposable diapers are available at many supermarkets and drug stores.
B. If one supermarket sets a higher price for a diaper, customers may buy that brand elsewhere.
C. By contrast, the demand for private-label products may be less price sensitive since it is available only at a corresponding supermarket chain.
D. So the demand for branded diapers at any particular store may be quite price sensitive.
E. For instance, only SavOn Drugs stores sell SavOn Drugs diapers.
F. Then stores should set a higher incremental margin percentage for private label diapers.

1. ABCDEF 2. ABCEDF 3. ADBCEF 4. AEDBCF

107. A. Having a strategy is a matter of discipline.
B. It involves the configuration of a tailored value chain that enables a company to offer unique value.
C. It requires a strong focus on profitability and a willingness to make tough tradeoffs in choosing what not to do.
D. Strategy goes far beyond the pursuit of best practices.
E. A company must stay the course even during times of upheaval, while constantly improving and extending its distinctive positioning.
F. When a company's activities fit together as a self-reinforcing system, any competitor wishing to imitate a strategy must replicate the whole system.

1. ACEDBF 2. ACBDEF 3. DCBEFA 4. ABCEDF

108. A. As officials, their vision of a country shouldn't run too far beyond that of the local people with whom they have to deal.
B. Ambassadors have to choose their words.
C. To say what they feel they have to say, they appear to be denying or ignoring part of what they know.
D. So, with ambassadors as with other expatriates in black Africa, there appears at a first meeting a kind of ambivalence.
E. They do a specialized job and it is necessary for them to live ceremonial lives.

1. BCEDA 2. BEDAC 3. BEADC 4. BCDEA

109. A. "This face-off will continue for several months given the strong convictions on either side," says a senior functionary of the high-powered task force on drought.
B. During the past week-and-half, the Central Government has sought to deny some of the earlier apprehensions over the impact of drought.
C. The recent revival of the rains had led to the emergence of a line of divide between the two.
D. The state governments, on the other hand, allege that the Centre is downplaying the crisis only to evade its full responsibility of financial assistance that is required to alleviate the damage.
E. Shrill alarm about the economic impact of an inadequate monsoon had been sounded by the Centre as well as most of the states, in late July and early August.

1. EBCDA 2. DBACE 3. BDCAE 4. ECBDA

110. A. This fact was established in the 1730s by French survey expeditions to Equador near the Equator and Lapland in the Arctic, which found that around the middle of the earth the arc was about a kilometer shorter.
B. One of the unsettled scientific questions in the late 18th century was that of exact nature of the shape of the earth.
C. The length of one-degree arc would be less near the equatorial latitudes than at the poles.
D. One way of doing that is to determine the length of the arc along a chosen longitude or meridian at one degree latitude separation.
E. While it was generally known that the earth was not a sphere but an 'oblate spheroid', more curved at the equator and flatter at the poles, the question of 'how much more' was yet to be established.

1. BECAD 2. BEDCA 3. EDACB 4. EBDCA

Directions for questions 111 to 116: Fill the gaps in the passages below with the most appropriate word from the options given for each gap. The right words are the ones used by the author. Be guided by the author's overall style and meaning when you choose the answers.

Von Nuemann and Morgenstern assume a decision framework in which all options are thoroughly considered, each option being independent of the others, with a numerical value derived for the utility of each possible outcome (these outcomes reflecting, in turn, all possible combinations of choices). The decision is then made to maximize the expected utility.

... 111 ... such a model reflects major simplifications of the way divisions are made in the real world. Humans are not able to process information as quickly and effectively as the model assumes; they tend not to think ... 112 ... as easily as the model calls for; they often deal with a particular option without really assessing its ... 113 ... and when they do assess alternatives, they may be extremely nebulous about their criteria of evaluation.

111.	1. Regrettably	2. Firstly	3. Obviously	4. Apparently
112.	1. quantitatively	2. systematically	3. scientifically	4. analytically
113.	1. implications	2. disadvantages	3. utility	4. alternatives

In a large company, ... 114 ... people is about as common as using a gun or a switch-blade to ... 115 ... an argument. As a result, most managers have little or no experience of firing people, and they find it emotionally traumatic; as result, they often delay the act interminably, much as an unhappy spouse will prolong a bad marriage. And when the firing is done, it's often done clumsily, with far worse side effects than are necessary.

Do the world-class software organizations have a different way of firing people? No, but they do the deed swiftly, humanely, and professionally.

The key point here is to view the fired employee as a 'failed product' and to ask how the *process* ... 116 ... such a phenomenon in the first place.

114.	1. dismissing	2. punishing	3. firing	4. admonishing
115.	1. resolve	2. thwart	3. defeat	4. close
116.	1. derived	2. engineered	3. produced	4. allowed

Directions for questions 117 to 120: In each of the questions below, four different ways of writing a sentence are indicated. Choose the best way of writing the sentence.

117. A. The main problem with the notion of price discrimination is that it is not always a bad thing, but that it is the monopolist who has the power to decide who is charged what price.
B. The main problem with the notion of price discrimination is not that it is always a bad thing, it is the monopolist who has the power to decide who is charged what price.
C. The main problem with the notion of price discrimination is not that it is always a bad thing, but that it is the monopolist who has the power to decide who is charged what price.
D. The main problem with the notion of price discrimination is not it is always a bad thing, but that it is the monopolist who has the power to decide who is charged what price.

1. A 2. B 3. C 4. D

118. A. A symbiotic relationship develops among the contractors, bureaucracy and the politicians, and by a large number of devices costs are artificially escalated and black money is generated by underhand deals.
B. A symbiotic relationship develops among contractors, bureaucracy and politicians, and costs are artificially escalated with a large number of devices and black money is generated through underhand deals.
C. A symbiotic relationship develops among contractors, bureaucracy and the politicians, and by a large number of devices costs are artificially escalated and black money is generated on underhand deals.
D. A symbiotic relationship develops among the contractors, bureaucracy and politicians, and by large number of devices costs are artificially escalated and black money is generated by underhand deals.

1. A 2. B 3. C 4. D

119. A. The distinctive feature of tariffs and export subsidies is that they create difference of prices at which goods are traded on the world market and their price within a local market.
B. The distinctive feature of tarriffs and export subsidies is that they create a difference of prices at which goods are traded with the world market and their prices in the local market.
C. The distinctive feature of tariffs and export subsidies is that they create a difference between prices at which goods are traded on the world market and their prices within a local market.
D. The distinctive feature of tarriffs and export subsidies is that they create a difference across prices at which goods are traded with the world market and their prices within a local market.

1. A 2. B 3. C 4. D

120. A. Any action of government to reduce the systemic risk inherent in financial markets will also reduce the risks that private operators perceive and thereby encourage excessive hedging.
B. Any action by government to reduce the systemic risk inherent in financial markets will also reduce the risks that private operators perceive and thereby encourage excessive gambling.
C. Any action by government to reduce the systemic risk inherent in financial markets will also reduce the risks that private operators perceive and thereby encourages excessive gambling.
D. Any action of government to reduce the systemic risk inherent in financial markets will also reduce the risks that private operators perceive and thereby encourages excessive gambling.

1. A 2. B 3. C 4. D

Directions for questions 121 to 125: For each of the words below a context is provided. From the alternatives given pick the word or phrase that is closest in meaning in the given context.

121. **Opprobrium:** The police officer appears oblivious to the opprobrium generated by his blatantly partisan conduct.

1. Harsh criticism 2. Acute distrust 3. Bitter enmity 4. Stark oppressiveness

122. **Portend:** It appears to many that the US 'war on terrorism' portends trouble in the Gulf.

1. Introduces 2. Evokes 3. Spells 4. Bodes

123. **Prevaricate:** When a videotape of her meeting was played back to her and she was asked to explain her presence there, she started prevaricating.

1. Speaking evasively 2. Speaking violently 3. Lying furiously 4. Throwing a tantrum

124. **Restive:** The crowd became restive when the minister failed to appear even by 10 pm.

1. Violent 2. Angry 3. Restless 4. Distressed

125. **Ostensible:** Manohar's ostensible job was to guard the building at night.

1. Apparent 2. Blatant 3. Ostentatious 4. Insidious

Directions for questions 126 to 150: Each of the five passages given below is followed by questions. Choose the best answer for each question.

PASSAGE – 1

The production of histories of India has become very frequent in recent years and may well call for some explanation. Why so many and why this one in particular? The reason is a two-fold one: changes in the Indian scene requiring a re-interpretation of the facts and changes in attitudes of historians about the essential elements of Indian history. These two considerations are in addition to the normal fact of fresh information, whether in the form of archeological discoveries throwing fresh light on an obscure period or culture, or the revelations caused by the opening of archives or the release of private papers. The changes in the Indian scene are too obvious to need emphasis. Only two generations ago British rule seemed to most Indian as well as British observers likely to extend into an indefinite future; now there is a teenage generation which knows nothing of it. Changes in the attitudes of historians have occurred everywhere, changes in attitudes to the content of the subject as well as to particular countries, but in India there have been some special features. Prior to the British, Indian historiographers were mostly Muslims, who relied, as in the case of Sayyid Ghulam Hussain, on their own recollection of events and on information from friends and men of affairs. Only a few like Abu'l Fazl had access to official papers. These were personal narratives of events, varying in value with the nature of the writer. The early British writers were officials. In the 18th century they were concerned with some aspect of Company policy, or like Robert Orme in his *Military Transactions* gave a straight narrative in what was essentially a continuation of the Muslim tradition. In the early 19th century the writers were still, with two notable exceptions, officials, but they were now engaged in chronicling, in varying moods of zest, pride, and awe, the rise of the British power in India to supremacy. The two exceptions were James Mill, with his critical attitude to the Company and John Marchman, the Baptist missionary. But they, like the officials, were anglo-centric in their attitude, so that the history of modern India in their hands came to be the history of the rise of the British in India.

The official school dominated the writing of Indian history until we get the first professional historian's approach. Ramsay Muir and P. E. Roberts in England and H. H. Dodwell in India. Then Indian historians trained in the English school joined in, of whom the most distinguished was Sir Jadunath Sarkar and the other notable writers: Surendranath Sen, Dr Radhakumud Mukherji, and Professor Nilakanta Sastri. They, it may be said, restored India to Indian history, but their bias was mainly political. Finally have come the nationalists who range from those who can find nothing good or true in the British to sophisticated historical philosophers like K. M. Panikker.

Along the types of historians with their varying bias have gone changes in the attitude to the content of Indian history. Here Indian historians have been influenced both by their local situation and by changes of thought elsewhere. It is this field that this work can claim some attention since it seeks to break new ground, or perhaps to deepen a freshly turned furrow in the field of Indian history. The early official historians were content with the glamour and drama of political history from Plassey to the Mutiny, from Dupleix to

the Sikhs. But when the *raj* was settled down, glamour departed from politics, and they turned to the less glorious but more solid ground of administration. Not how India was conquered but how it was governed was the theme of this school of historians. It found its archpriest in H. H. Dodwell, its priestess in Dame Lilian Penson, and its chief shrine in the Volume VI of the *Cambridge History of India*. Meanwhile, in Britain other currents were moving, which led historical study into the economic and social fields. R. C. Dutt entered the first of these currents with his *Economic History of India* to be followed more recently by the whole group of Indian economic historians. W. E. Moreland extended these studies to the Mughal Period. Social history is now being increasingly studied and there is also of course a school of nationalist historians who see modern Indian history in terms of the rise and the fulfillment of the national movement.

All these approaches have value, but all share in the quality of being compartmental. It is not enough to remove political history from its pedestal of being the only kind of history worth having if it is merely to put other types of history in its place. Too exclusive an attention to economic, social, or administrative history can be as sterile and misleading as too much concentration on politics. A whole subject needs a whole treatment for understanding. A historian must dissect his subject into its elements and then fuse them together again into an integrated whole. The true history of a country must contain all the features just cited but must present them as parts of a single consistent theme.

126. Which of the following may be the closest in meaning to the statement ‘restored India to Indian history’?
    1. Indian historians began writing Indian history.
    2. Trained historians began writing Indian history.
    3. Writing India-centric Indian history began.
    4. Indian history began to be written in India.

127. Which of the following is the closest implication of the statement ‘to break new ground, or perhaps to deepen a freshly turned furrow’?
    1. Dig afresh or dig deeper.
    2. Start a new stream of thought or help establish a recently emerged perspective.
    3. Begin or conduct further work on existing archeological sites to unearth new evidence.
    4. Begin writing a history free of any biases.

128. Historians moved from writing political history to writing administrative history because
    1. attitudes of the historians changed.
    2. the *raj* was settled down.
    3. politics did not retain its past glamour.
    4. administrative history was based on solid ground.

129. According to the author, which of the following is not among the attitudes of Indian historians of Indian origin?
1. Writing history as personal narratives.
2. Writing history with political bias.
3. Writing non-political history due to lack of glamour.
4. Writing history by dissecting elements and integrating them again.

130. In the table given below, match the historians to the approaches taken by them.

A	Administrative	**E**	Robert Orme
B	Political	**F**	H.H. Dodwell
C	Narrative	**G**	Radha Kumud Mukherji
D	Economic	**H**	R.C. Dutt

1	
A	**F**
B	**G**
C	**E**
D	**H**

2	
A	**G**
B	**F**
C	**E**
D	**H**

3	
A	**E**
B	**F**
C	**G**
D	**H**

4	
A	**F**
B	**H**
C	**E**
D	**G**

PASSAGE – 2

There are a seemingly endless variety of laws, restrictions, customs and traditions that affect the practice of abortion around the world. Globally, abortion is probably the single most controversial issue in the whole area of women's rights and family matters. It is an issue that inflames women's right groups, religious institutions, and the self-proclaimed 'guardians' of public morality. The growing worldwide belief is that the right to control one's fertility is a basic human right. This has resulted in a worldwide trend towards liberalization of abortion laws. Forty per cent of the world's population live in countries where induced abortion is permitted on request. An additional 25 per cent live in countries where it is allowed if the women's life would be endangered if she went to full term with her pregnancy. The estimate is that between 26 and 31 million legal abortions were performed in that year. However, there were also between 10 and 22 million illegal abortions performed in that year.

Feminists have viewed the patriarchal control of women's bodies as one of the prime issues facing the contemporary women's movement. They observe that the defintion and control of women's reproductive freedom have always been the province of men. Patriarchal religion, as manifest in Islamic fundamentalism, traditionalist Hindu practice, orthodox Judaism, and Roman Catholicism, has been an important historical contributory factor for this and continues to be an important presence in contemporary societies. In recent times, governments, usually controlled by men, have 'given' women the right to contraceptive use and

abortion access when their countries were perceived to have an overpopulation problem. When these countries are perceived to be underpopulated, that right had been absent. Until the 19th century, a woman's rights to an abortion followed English common law; it could only be legally challenged if there was a 'quickening', when the first movements of the fetus could be felt. In 1800, drugs to induce abortions were widely advertised in local newspapers. By 1900, abortion was banned in every state except to save the life of the mother. The change was strongly influenced by medical profession, which focussed its campaign ostensibly on health and safety issues for pregnant women and the sancity of life. Its position was also a means of control of non-licensed medical practitioners such as midwives and women healers who practiced abortion.

The anti-abortion campaign was also influenced by political considerations. The large influx of eastern and southern European immigrants with their large families was seen as a threat to the population balance of the future United States. Middle and upper-classes Protestants were advocates of abortion as a form of birth control. By supporting abortion prohibitions the hope was that these Americans would have more children and thus prevent the tide of immigrant babies from overwhelming the demographic characteristics of Protestant America.

The anti-abortion legislative position remained in effect in the United States through the first 65 years of the 20th century. In the early 1960s, even when it was widely known that the drug thalidomide taken during pregnancy to alleviate anxiety was shown to contribute to the formation of deformed 'flipper-like' hands or legs of children, abortion was illegal in the United States. A second health tragedy was the severe outbreak of rubella during the same time period, which also resulted in major birth defects. These tragedies combined with a change of attitude towards a woman's right to privacy led a number of states to pass abortion-permitting legislation.

On one side of the controversy are those who call themselves 'pro-life'. They view the foetus as a human life rather than as an unformed complex of cells; therefore, they hold to the belief that abortion is essentially murder of an unborn child. These groups cite both legal and religious reasons for their opposition to abortion. Pro-lifers point to the rise in legalised abortion figures and see this as morally intolerable. On the other side of the issue are those who call themselves 'pro-choice'. They believe that women, not legislators or judges, should have the right to decide whether and under what circumstances they will bear children. Pro-choicers are of the opinion that laws will not prevent women from having abortions and cite the horror stories of the past when many women died at the hands of 'backroom' abortionists and in desperate attempts to self-abort. They also observe that legalized abortion is especially important for rape victims and incest victims who became pregnant. They stress physical and mental health reasons why women should not have unwanted children.

To get a better understanding of the current abortion controversy, let us examine a very important work by Kristin Luker titled *Abortion and the Politics of Motherhood*. Luker argues that female pro-choice and pro-life activists hold different world views regarding gender, sex, and the meaning of parenthood. Moral positions on abortions are seen to be tied intimately to views on sexual bahavior, the care of children, family life, technology, and the importance of the individual. Luker identified 'pro-choice' women as educated, affluent, and liberal. Their contrasting counterparts, 'pro-life' women, support traditional concepts of women as wives and mothers. It would be instructive to sketch out the differences in the world views of these two sets of women. Luker examines California, with its liberalized abortion law, as a case history. Public documents and newspaper accounts over a 26-year period were analysed and over 200 interviews were held with both pro-life and pro-choice activists.

Luker found that pro-life and pro-choice activists have intrinsically different views with respect to gender. Pro-life women have a notion of public and private life. The proper place for men is in the public sphere of work; for women, it is the private sphere of the home. Men benefit through the nurturance of women; women benefit through the protection of men. Children are seen to be the ultimate beneficiaries of this arrangement of having the mother as a full-time loving parent and by having clear role models. Pro-choice advocates reject the view of separate spheres. They object to the notion of the home being the 'women's sphere'. Women's reproductive and family roles are seen as potential barriers to full equality. Motherhood is seen as a voluntary, not a mandatory or 'natural' role.

In summarizing her findings, Luker believes that women become activists in either of the two movements as the end result of lives that centre around different conceptualizations of motherhood. Their beliefs and values are rooted to the concrete circumstances of their lives, their educations, incomes, occupations, and the different marital and family choices that they have made. They represent two different world views of women's roles in contemporary society and as such the abortion issues represent the battleground for the justification of their respective views.

131. According to your understanding of the author's arguments, which countries are more likely to allow abortion?
    1. India and China
    2. Australia and Mongolia
    3. Cannot be inferred from the passage
    4. Both (1) and (2)

132. Which amongst these was not a reason for banning of abortions by 1900?
    1. Medical professionals stressing the health and safety of women
    2. Influx of eastern and southern European immigrants
    3. Control of unlicensed medical practitioners
    4. A tradition of matriarchal control

133. A pro-life woman would advocate abortion if
    1. the mother of an unborn child is suicidal.
    2. bearing a child conflicts with a woman's career prospects.
    3. the mother becomes pregnant accidentally.
    4. None of these

134. Pro-choice women object to the notion of the home being the 'women's sphere' because they believe
    1. that home is a 'joint sphere' shared between men and women.
    2. that reproduction is a matter of choice for women
    3. that men and women are equal
    4. Both (2) and (3)

135. Two health tragedies affecting the US society in the 1960s led to
    1. a change in attitude to women's right to privacy.
    2. retaining the anti-abortion laws with some exceptions.
    3. scrapping of anti-abortion laws.
    4. strengthening of the pro-life lobby.

136. Historically, the pro-choice movements has got support from, among others,
    1. major patriarchal religions.
    2. countries with low population density.
    3. medical profession.
    4. None of these

PASSAGE – 3

The conceptions of life and the world which we call 'philosophical' are a product of two factors: one inherited religious and ethical conceptions; the other, the sort of investigation which may be called 'scientific', using this word in its broadest sense. Individual philosophers have differed widely in regard to the proportions in which these two factors entered into their systems, but it is the presence of both, in some degree, that characterizes philosophy.

'Philosophy' is a word which has been used in many ways, some wider, some narrower. I propose to use it in a very wide sense, which I will now try to explain.

Philosophy, as I shall understand the word, is something intermediate between theology and science. Like theology, it consists of speculations on matters as to which definite knowledge has, so far, been unascertainable; but like science, it appeals to human reason rather than to authority, whether that of tradition or that of revelation. All definite knowledge so I should contend belongs to science; all dogma as to what surpasses definite knowledge belongs to thelogy. But between theology and science there is a 'No

Man's Land', exposed to attack from both sides; this 'No Man's Land' is philosophy. Almost all the questions of most interest to speculative minds are such as science cannot answer, and the confident answers of theologians no longer seem so convincing as they did in former centuries. Is the world divided into mind and matter, and if so, what is mind and what is matter? Is mind subject to matter, or is it possessed of independent powers? Has the universe any unity or purpose? Is it evolving towards some goal? Are there really laws of nature, or do we believe in them only because of our innate love of order? Is man what he seems to the astronomer, a tiny lump of carbon and water impotently crawling on a small and unimportant planet? Or is he what he appears to Hamlet? Is he perhaps both at once? Is there a way of living that is noble and another that is base, or are all ways of living merely futile? If there is a way of living that is noble, in what does it consist, and how shall we achieve it? Must the good be eternal in order to deserve to be valued, or is it worth seeking even if the universe is inexorably moving towards death? Is there such a thing as wisdom, or is what seems such merely the ultimate refinement of folly? To such questions no answer can be found in the laboratory. Theologies have professed to give answers, all too definite; but their definiteness causes modern minds to view them with suspicion. The studying of these questions, if not the answering of them, is the business of philosophy.

Why, then, you may ask, waste time on such insoluble problems? To this one may answer as a historian, or as an individual facing the terror of cosmic loneliness.

The answer of the historian, in so far as I am capable of giving it, will appear in the course of this work. Ever since men became capable of free speculation, their actions in innumerable important respects, have depended upon their theories as to the world and human life, as to what is good and what is evil. This is as true in the present day as at any former time. To understand an age or a nation, we must understand its philosophy, and to understand its philosophy we must ourselves be in some degree philosophers. There is here a reciprocal causation: the circumstances of men's lives do much to determine their philosophy, but, conversely, their philosophy does much to determine their circumstances.

There is also, however, a more personal answer. Science tells us what we can know, but what we can know is little, and if we forget how much we cannot know we may become insensitive to many things of very great importance. Theology, on the other hand, induces a dogmatic belief that we have knowledge, where in fact we have ignorance, and by doing so generates a kind of impertinent insolence towards the universe. Uncertainty, in the presence of vivid hopes and fears, is painful, but must be endured if we wish to live without the support of comforting fairy tales. It is good either to forget the questions that philosophy asks, or to persuade ourselves that we have found indubitable answers to them. To teach how to live without certainty, and yet without being paralyzed by hesitation, is perhaps the chief thing that philosophy, in our age, can still do for those who study it.

137. The purpose of philosophy is to
1. reduce uncertainty and chaos.
2. help us to cope with uncertainty and ambiguity.
3. help us to find explanations for uncertainty.
4. reduce the terror of cosmic loneliness.

138. Based on the passage, what can be concluded about the relation between philosophy and science?
1. The two are antagonistic.
2. The two are complementary.
3. There is no relation between the two.
4. Philosophy derives from science.

139. From reading the passage, what can be concluded about the profession of the author? He is most likely not to be a
1. historian.
2. philosopher.
3. scientist.
4. theologian.

140. According to the author, which of the following statements about the nature of universe must be definitely true?
1. The universe has unity.
2. The universe has a purpose.
3. The universe is evolving towards a goal.
4. None of these

PASSAGE – 4

Cells are the ultimate multi-taskers: they can switch on genes and carry out their orders, talk to each other, divide in two, and much more, all at the same time. But they couldn't do any of these tricks without a power source to generate movement. The inside of a cell bustles with more traffic than Delhi roads, and, like all vehicles, the cell's moving parts need engines. Physicists and biologists have looked 'under the hood' of the cell and laid out the nuts and bolts of molecular engines.

The ability of such engines to convert chemical energy into motion is amazing nanotechnology researchers are looking for ways to power molecule-sized devices. Medical researchers also want to understand how these engines work. Because these molecules are essential for cell division, scientists hope to shut down the rampant growth of cancer cells by deactivating certain motors. Improving motor-driven transport in nerve cells may also be helpful for treating diseases such as Alzheimer's, Parkinson's or ALS, also known as Lou Gehrig's disease.

We wouldn't make it far in life without motor proteins. Our muscles wouldn't contract. We couldn't grow, because the growth process requires cells to duplicate their machinery and pull the copies apart. And our genes would be silent without the services of messenger RNA, which carries genetic instructions over to the cell's protein-making factories. The movements that make these cellular activities possible occur along a complex network of threadlike fibers, or polymers, along which bundles of molecules travel like trams. The engines that power the cell's freight are three families of proteins, called myosin, kinesin and dynein. For fuel, these proteins burn molecules of ATP, which cells make when they break down the carbohydrates and fats from the foods we eat. The energy from burning ATP causes changes in the proteins' shape that allow them to heave themselves along the polymer track. The results are impressive: In one second, these molecules can travel between 50 and 100 times their own diameter. If a car with a five-foot-wide engine were as efficient, it would travel 170 to 340 kilometres per hour.

Ronald Vale, a researcher at the Howard Hughes Medical Institute and the University of California at San Francisco, and Ronald Milligan of the Scripps Research Institute have realized a long-awaited goal by reconstructing the process by which myosin and kinesin move, almost down to the atom. The dynein motor, on the other hand, is still poorly understood. Myosin molecules, best known for their role in muscle contraction, form chains that lie between filaments of another protein called actin. Each myosin molecule has a tiny head that pokes out from the chain like oars from a canoe. Just as rowers propel their boat by stroking their oars through the water, the myosin molecules stick their heads into the actin and hoist themselves forward along the filament. While myosin moves along in short strokes, its cousin kinesin walks steadily along a different type of filament called a microtubule. Instead of using a projecting head as a lever, kinesin walks on two 'legs'. Based on these differences, researchers used to think that myosin and kinesin were virtually unrelated. But newly discovered similarities in the motors' ATP-processing machinery now suggest that they share a common ancestor — molecule. At this point, scientists can only speculate as to what type of primitive cell-like structure this ancestor occupied as it learned to burn ATP and use the energy to change shape. "We'll never really know, because we can't dig up the remains of ancient proteins, but that was probably a big evolutionary leap," says Vale.

On a slightly larger scale, loner cells like sperm or infectious bacteria are prime movers that resolutely push their way through to other cells. As L. Mahadevan and Paul Matsudaira of the Massachusetts Institute of Technology explain, the engines in this case are springs or ratchets that are clusters of molecules, rather than single proteins like myosin and kinesin. Researchers don't yet fully understand these engines' fueling process or the details of how they move, but the result is a force to be reckoned with. For example, one such engine is a spring-like stalk connecting a single-celled organism called a vorticellid to the leaf fragment it calls home. When exposed to calcium, the spring contracts, yanking the vorticellid down at speeds approaching three inches (eight centimetres) per second.

Springs like this are coiled bundles of filaments that expand or contract in response to chemical cues. A wave of positively charged calcium ions, for example, neutralizes the negative charges that keep the filaments extended. Some sperm use spring-like engines made of actin filaments to shoot out a barb that

penetrates the layers that surround an egg. And certain viruses use a similar apparatus to shoot their DNA into the host's cell. Ratchets are also useful for moving whole cells, including some other sperm and pathogens. These engines are filaments that simply grow at one end, attracting chemical building blocks from nearby. Because the other end is anchored in place, the growing end pushes against any barrier that gets in its way.

Both springs and ratchets are made up of small units that each move just slightly, but collectively produce a powerful movement. Ultimately, Mahadevan and Matsudaira hope to better understand just how these particles create an effect that seems to be so much more than the sum of its parts. Might such an understanding provide inspiration for ways to power artificial nano-sized devices in the future? "The short answer is absolutely," says Mahadevan. "Biology has had a lot more time to evolve enormous richness in design for different organisms. Hopefully, studying these structures will not only improve our understanding of the biological world, it will also enable us to copy them, take apart their components and recreate them for other purpose."

141. According to the author, research on the power source of movement in cells can contribute to
    1. control over the movement of genes within human systems.
    2. the understanding of nanotechnology.
    3. arresting the growth of cancer in a human being.
    4. the development of cures for a variety of diseases.

142. The author has used several analogies to illustrate his arguments in the article. Which of the following pairs of words are examples of the analogies used?
    A. Cell activity and vehicular traffic
    B. Polymers and tram tracks
    C. Genes and canoes
    D. Vorticellids and ratchets
    1. A and B 2. B and C 3. A and D 4. A and C

143. Read the five statements below: A, B, C, D, and E. From the options given, select the one which includes a statement that is not representative of an argument presented in the passage.
    A. Sperms use spring like engines made of actin filament.
    B. Myosin and kinesin are unrelated.
    C. Nanotechnology researchers look for ways to power molecule-sized devices.
    D. Motor proteins help muscle contraction.
    E. The dynein motor is still poorly understood.
    1. A, B and C 2. C, D and E 3. A, D and E 4. A, C and D

144. Read the four statements below: A, B, C and D. From the options given, select the one which includes only statements that are representative of arguments presented in the passage.

A. Protein motors help growth processes.
B. Improved transport in nerve cells will help arrest tuberculosis and cancer.
C. Cells, together, generate more power than the sum of power generated by them separately.
D. Vorticellid and the leaf fragment are connected by a calcium engine.

1. A and B but not C
2. A and C but not D
3. A and D but not B
4. C and D but not B

145. Read the four statements below: A, B, C and D. From the options given, select the one which includes statements that are representative of arguments presented in the passage.

A. Myosin, kinesin and actin are three types of protein.
B. Growth processes involve a routine in a cell that duplicates their machinery and pulls the copies apart.
C. Myosin molecules can generate vibrations in muscles.
D. Ronald and Mahadevan are researchers at Massachusetts Institute of Technology.

1. A and B but not C and D
2. B and C but not A
3. B and D but not A and C
4. A, B and C but not D

PASSAGE – 5

If translated into English, most of the ways economists talk among themselves would sound plausible enough to poets, journalists, businesspeople, and other thoughtful though *non-economical* folk. Like serious talk anywhere — among boat desingers and baseball fans, say — the talk is hard to follow when one has not made a habit of listening to it for a while. The culture of the conversation makes the words arcane. But the people in the unfamiliar conversation are not Martians. Underneath it all (the economist's favourite phrase) conversational habits are similar. Economics uses mathematical models and statistical tests and market arguments, all of which look alien to the literary eye. But looked at closely they are not so alien. They may be seen as figures of speech-metaphors, analogies, and appeals to authority.

Figures of speech are not mere frills. They think for us. Someone who thinks of a market as an 'invisible hand' and the organization of work as a 'production function' and his coefficients as being 'significant', as an economist does, is giving the language a lot of responsibility. It seems a good idea to look hard at his language.

If the economic conversation were found to depend a lot on its verbal forms, this would not mean that economics would be not a science, or just a matter of opinion, or some sort of confidence game. Good poets, though not scientists, are serious thinkers about symbols; good historians, though not scientists, are serious thinkers about data. Good scientists also use language. What is more (though it remains to be shown) they use the cunning of language, without particularly meaning to. The language used is a social

object, and using language is a social act. It requires cunning (or, if you prefer, consideration), attention to the other minds present when one speaks.

The paying of attention to one's audience is called 'rhetoric', a word that I later exercise hard. One uses rhetoric, of course, to warn of a fire in a theatre or to arouse the xenophobia of the electorate. This sort of yelling is the vulgar meaning of the word, like the president's 'heated rhetoric' in a press conference or the 'mere rhetoric' to which our enemies stoop. Since the Greek flame was lit, though, the word has been used also in a broader and more amiable sense, to mean the study of all the ways of accomplishing things with language: inciting a mob to lynch the accused, to be sure, but also persuading readers of a novel that its characters breathe, or bringing scholars to accept the better argument and reject the worse.

The question is whether the scholar- who usually fancies himself an announcer of 'results' or a stater of 'conclusions' free of rhetoric — speaks rhetorically. Does he try to persuade? It would seem so. Language, I just said, is not a solitary accomplishment. The scholar doesn't speak into the void, or to himself. He speaks to a community of voices. He desires to be heeded, praised, published, imitated, honoured, en-Nobeled. These are the desires. The devices of language are the means.

Rhetoric is the proportioning of means to desires in speech. Rhetoric is an economics of language, the study of how scarce means are allocated to the insatiable desires of people to be heard. It seems on the face of it a reasonable hypothesis that economists are like other people in being talkers, who desire listeners whey they go to the library or the laboratory as much as when they go to the office or the polls. The purpose here is to see if this is true, and to see if it is useful: to study the rhetoric of economic scholarship.

The subject is scholarship. It is not the economy, or the adequacy of economic theory as a description of the economy, or even mainly the economist's role in the economy. The subject is the conversation economists have among themselves, for purposes of persuading each other that the interest elasticity of demand for investment is zero or that the money supply is controlled by the Federal Reserve.

Unfortunately, though, the conclusions are of more than academic interest. The conversations of classicists or of astronomers rarely affect the lives of other people. Those of economists do so on a large scale. A well known joke describes a May Day parade through Red Square with the usual mass of soldiers, guided missiles, rocket launchers. At last come rank upon rank of people in gray business suits. A bystander asks, "Who are those?" "Aha!" comes the reply, "Those are economists: you have no idea what damage they can do!" Their conversations do it.

146. According to the passage, which of the following is the best set of reasons for which one needs to 'look hard' at an economist's language?

A. Economists accomplish a great deal through their language.

B. Economics is an opinion-based subject.

C. Economics has a great impact on other's lives.

D. Economics is damaging.

1. A and B 2. C and D 3. A and C 4. B and D

147. In the light of the definition of rhetoric given in the passage, which of the following will have the least element of rhetoric?

1. An election speech
2. An advertisement jingle
3. Dialogues in a play
4. Commands given by army officers

148. As used in the passage, which of the following is the closest meaning to the statement 'The culture of the conversation makes the words arcane'?

1. Economists belong to a different culture.
2. Only mathematicians can understand economists.
3. Economists tend to use terms unfamiliar to the lay person, but depend on familiar linguistic forms.
4. Economists use similes and adjectives in their analysis.

149. As used in the passage, which of the following is the closest alternative to the word 'arcane'?

1. Mysterious 2. Secret 3. Covert 4. Perfidious

150. Based on your understanding of the passage, which of the following conclusions would you agree with?

1. The geocentric and the heliocentric views of the solar system are equally tenable.
2. The heliocentric view is superior because of better rhetoric.
3. Both views use rhetoric to persuade.
4. Scientists should not use rhetoric.

CAT 2002 Actual Paper

ANSWERS and EXPLANATIONS

1	3	**2**	4	**3**	4	**4**	3	**5**	3	**6**	1	**7**	1	**8**	3	**9**	3	**10**	3
11	2	**12**	4	**13**	1	**14**	4	**15**	1	**16**	1	**17**	1	**18**	4	**19**	2	**20**	3
21	3	**22**	3	**23**	4	**24**	1	**25**	3	**26**	3	**27**	2	**28**	2	**29**	2	**30**	2
31	2	**32**	4	**33**	4	**34**	2	**35**	2	**36**	2	**37**	3	**38**	2	**39**	1	**40**	4
41	2	**42**	2	**43**	2	**44**	4	**45**	3	**46**	1	**47**	3	**48**	2	**49**	4	**50**	3
51	3	**52**	2	**53**	1	**54**	2	**55**	1	**56**	4	**57**	4	**58**	2	**59**	4	**60**	4
61	3	**62**	2	**63**	4	**64**	3	**65**	3	**66**	2	**67**	2	**68**	4	**69**	3	**70**	1
71	3	**72**	2	**73**	3	**74**	4	**75**	4	**76**	1	**77**	1	**78**	4	**79**	2	**80**	4
81	4	**82**	3	**83**	4	**84**	3	**85**	1	**86**	3	**87**	*2	**88**	3	**89**	2	**90**	2
91	4	**92**	4	**93**	4	**94**	3	**95**	4	**96**	2	**97**	2	**98**	4	**99**	3	**100**	3
101	3	**102**	2	**103**	4	**104**	2	**105**	4	**106**	3	**107**	1	**108**	3	**109**	4	**110**	2
111	3	**112**	1	**113**	4	**114**	3	**115**	1	**116**	4	**117**	3	**118**	2	**119**	3	**120**	2
121	1	**122**	4	**123**	1	**124**	3	**125**	1	**126**	3	**127**	2	**128**	3	**129**	4	**130**	1
131	1	**132**	4	**133**	4	**134**	4	**135**	2	**136**	4	**137**	2	**138**	2	**139**	4	**140**	4
141	4	**142**	1	**143**	1	**144**	2	**145**	1	**146**	3	**147**	4	**148**	3	**149**	1	**150**	3

Scoring table

Section	Question number	Total questions	Total attempted	Total correct	Total incorrect	Net score	Time taken
DI	1 to 50	50					
QA	51 to 100	50					
EU + RC	101 to 150	50					
Total		150					

1. 3 Statement I tells us that
(1) Ashish is not an engineer, (2) Ashish got more offers than the engineers.
Hence, Ashish did not have 0 offers.
After this the following table can be achieved.

Profession	Names		Offers			
		3	2	1	0	X Profession
CA	Ashish	×	×	✓	×	X Engineer
MD	Dhanraj	✓	×	×	×	X Engineer
Economist	Sameer	×	✓	×	×	
Engineer		×	×	×	✓	

From statement IV, Dhanraj is not at 0 and 1.

2. 4 Option (3) is ruled out by statement VII.
Option (1) is ruled out by statements VII and VIII.
From statement IV, Sandeep had Rs. 30 to start and Daljeet Rs. 20.
From statement II, option (2) is not possible as Sandeep was left with Re 1, he spent Rs. 29. But according to (2) he spent Rs. 1.50 more than Daljeet. But Daljeet had only Rs. 20. Hence option (4) is correct.

3. 4 Data insufficient, please check the question.

4. 3 Statements V and VI rule out options (1) and (2). Since contestants from Bangalore and Pune did not come first, school from Hyderabad can come first. Convent is not in Hyderabad which rules out option (4).

5. 3 The only two possible combinations are:

Younger	Older
2	4
3	9

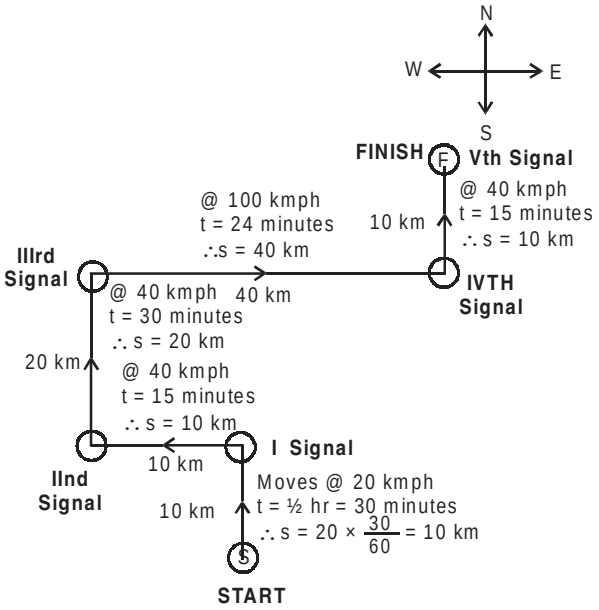
Cubes of natural numbers are 1, 8, 27, 64, ... Here, 64 and above are not possible as the age will go above 10 years.
If younger boy is 2 years old, then older boy is 4 years
old. Then, Father's age is 24 years and Mother's age is $\frac{42}{2} = 21$ years.
Also, 24 – 21 = 3
∴ Age of younger boy = 2 years

6. 1

Total seats in the hall	200
Seats vacant	20
Total waiting	180
Ladies	72

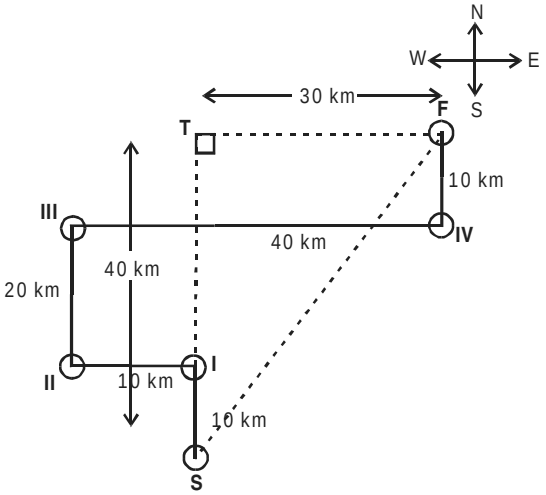
Seating capacity of flight $\frac{2}{3} \times 180 = 120$
Number of people in flight A = 100
For flight B = 180 – 100 = 80
Thus, airhostess for A = $\frac{80}{20} = 4$
Empty seats in flight B = 120 – 80 = 40
40 : 4 = 10 : 1

7. 1



Note: s = Distance covered; v = Velocity (km/hr)
t = Time taken; s = v × t
The total distance travelled by the motorist from the starting point till last signal = 10 + 10 + 20 + 40 + 10 = 90 km.

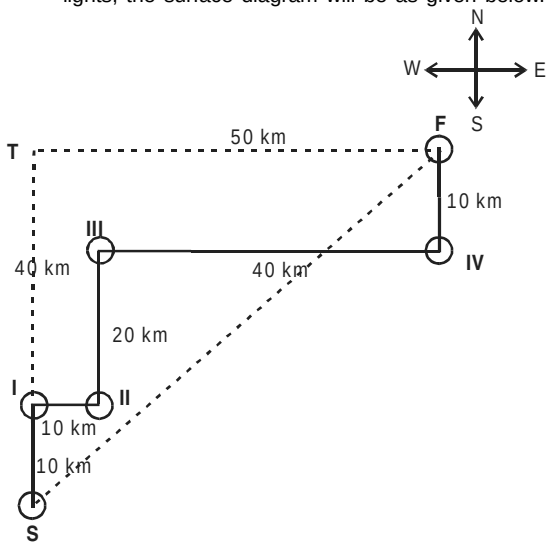
8. 3



By Pythagoras' Theorem,

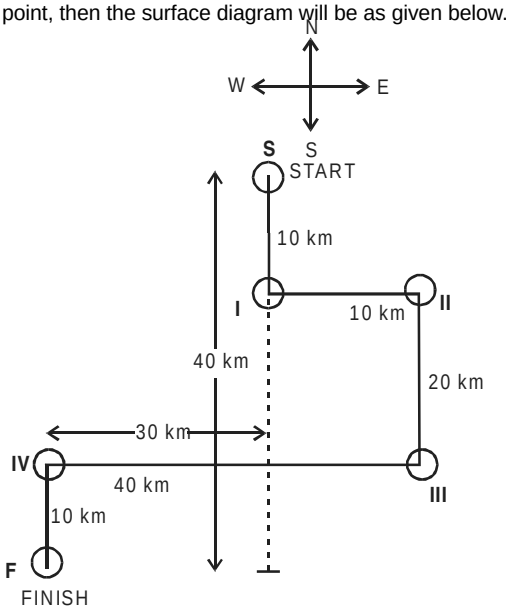
$SF = \sqrt{ST^2 + TF^2} = \sqrt{40^2 + 30^2} = \sqrt{2500} = 50$ km

9. 3 For the case when 1st signal were 1 red and 2 green lights, the surface diagram will be as given below.



TF = 50 km; ST = 40 km
Considering the above figure, option (3) is correct, 50 km to the east and 40 km to the north.

10. 3 If the car was heading towards South from the start point, then the surface diagram will be as given below.



Hence, we can see that option (3) is correct.

11. 2 Total five lie between 10 E and 40 E.
Austria, Bulgaria, Libya, Poland, Zambia
N N N N S

$\frac{1}{5} = 20\%$

12. 4 Number of cities starting with consonant and in the northern hemisphere = 10.
Number of countries starting with consonant and in the east of the meridien = 13.
Hence, option (4) is the correct choice. The difference is 3.

13. 1 Three countries starting with vowels and in southern hemisphere — Argentina. Australia and Ecuador and two countries with capitals beginning with vowels — Canada and Ghana.

14. 4 Let us consider two cases:
(a) If 5 min remaining the score was 0 – 2. Then final score could have been 3 – 3. [Assuming no other Indian scored]
(b) But if the score before 5 min was 1 – 3, then final score could have been 4 – 3.

14. 4 From statement A, we know only the number of goals made by India is the last 5 minutes. But, as we don't know what the opponent team did in the last 5 minutes, we can't conclude anything. So statement A alone is not sufficient.
Similarly, statement B does not talk about the total number of goals scored by India. So statement B is not sufficient.
Using both the statements, we have two possibilities:
(I) If Korea had scored 3 goals 5 minutes before the end of the match India would have scored 1 goal. In the last 5 minutes as India made 3 goals and Korea on the whole made 3 goals, we can conclude that India had won the game.
(II) If Korea had scored 3 goals 5 minutes before the end of the match, India would have scored zero goals. In the last 5 minutes, as India made 3 goals and Korea on the whole made 3 goals, we can say the match was drawn.
Hence, we cannot answer the question even boy using both the statements together.

15. 1 From A, if by adding 12 students, the total number of students is divisible by 8. By adding 4 students, it will be divisible by 8.

16. 1 From (A), $(x + y)\left(\frac{1}{x} + \frac{1}{y}\right) = 4$ or $(x + y)\left(\frac{y + x}{xy}\right) = 4$

$\Rightarrow (x + y)^2 = 4xy$

$\Rightarrow (x - y)^2 = 0$

$\Rightarrow x = y$ ... (i)

From (B), $(x - 50)^2 = (y - 50)^2$

On solving

$x(x - 100) = y(y - 100)$ ... (ii)

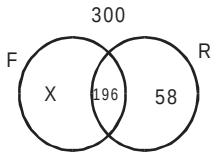
This suggests that the values of x and y can either be 0 or 100.

17. 1 Statement:
A. Let the wholesale price is x.
Thus, listed prices = 1.2x
After a discount of 10%, new price = 0.9 × 1.2x
= 1.08x
$\therefore$ 1.08 – x = 10$.
Thus, we know x can be found.
B. We do not know at what percentage profit, or at what amount of profit the dress was actually sold.

18. 4 A gives 500 as median and B gives 600 as range.
A and B together do not give average. Therefore, it cannot be answered from the given statements.

19. 2 From statement A, we know that for all $-1 < x < 1$, we can determine $|x - 2| < 1$ is not true. Therefore, statement A alone is sufficient.
From statement B, $-1 < x < 3$, we cannot determine whether $|x - 2| < 1$ or not. Therefore, statement B alone is sufficient.

20. 3 From statement A, we cannot find anything.
From B alone we cannot find.
From A and B,



x + 196 + 58 = 300. Thus, x can be found.

21. 3 Jagdish (J), Punit (P), Girish (G)

(A) $J = \frac{2}{9}[P + G]$

P + G + J = 38500
Thus, only J can be found.
(B) Similarly, from this only P can be found.
Combining we know J, P and G can be found.

22. 3 Emp. numbers 51, 58, 64, 72, 73 earn more than 50 per day in complex operations.
Total = 5

23. 4 80% attendance = 80% of 25 = 20 days
Emp. numbers 47, 51, 72, 73, 74, 79, 80.
Thus, total = 7

24. 1

Emp. No.	Earnings E (medium)	No. of days D (medium)	E/D
2001151	159.64	13.33	11.97
2001158	109.72	9.61	11.41
2001164	735.22	12.07	60.91
2001171	6.10	4.25	-
2001172	117.46	8.50	13.81
2001179	776.19	19.00	40.85
2001180	1262.79	19.00	66.46

Hence, Emp. number 2001180 earns the maximum earnings per day.

25. 3 Emp. numbers 51, 58, 64, 71, 72 satisfy the condition.
[For emp. 64, you see 12 is not the double of 5. And 735 is not even double of 402.

Hence, $\frac{402}{5} > \frac{735}{12}$.

Note: Emp. numbers 48, 49, 50 are not eligible for earnings. Hence, they are not counted.

26. 3 Total revenue of 1999 = 3374

5% of 3374 = $3374 \times \frac{5}{100} = 168.7$

For 1999, revenue for Spain is 55, Rest of Latin America is 115, North Sea is 140, Rest of the world is 91.
So total four operations of the company accounted for less than 5% of the total revenue earned in the year 1999.

27. 2 **The language in the question is ambiguous.**
Taking the question to be more than 200% growth in revenue, the revenue in 2000 will be more than 3 times that in 1999. Hence, (2) is the answer.
Taking the revenue in 2000 to be more than 200% of that in 1999, the revenue in 2000 should be more than twice of that in 1999. Then there will be 4 operations.

28. 2 Four operations, as given below:
(1) North Africa and Middle-East
(2) Argentina
(3) Rest of Latin America
(4) Far East
have registered yearly increase in income before taxes and charges from 1998 to 2000.

29. 2 Percentage increase in net income before tax and charges for total world (1998-99)

$= \frac{1375 - 248}{248} \times 100 = 454.4\%$

Spain is making loss.

Percentage increase for North Africa and Middle-East

$\frac{341-111}{111} \times 100 = 207.2\%$

Percentage increase for Argentina $= \frac{838-94}{94} \times 100$
$= 791.5\%$

From the table one can directly say that there is no operation other than Argentina, whose percentage increase in net income before taxes and charges is higher than the average (world).

30. 2 Statement 1 is obviously wrong.
(2) $\frac{54}{65} > \frac{20}{52}$. Hence, (2) is correct.
(3) $\frac{500}{1168} > \frac{61}{187}$. Hence (3) is wrong.

31. 2 Profitability of North Africa and Middle-East in 2000
$= \frac{356}{530} = 0.67$

Profitability of Spain in 2000 $= \frac{225}{43} = 5.23$

Profitability of Rest of Latin America in 2000 $= \frac{169}{252}$, i.e. < 1.

Profitability of Far East in 2000 $= \frac{189}{311} = < 1$

32. 4 Except Rest of Latin America and Rest of the World all the operations are greater than 2.

33. 4 Options (1), (2) and (3), are ruled out. So the correct option is (4).

34. 2 It can be easily observed from the two charts that Switzerland's ratio of chart 1 to chart 2 is $\frac{20}{11}$ has the highest price per unit kilogram for its supply. Finding the ratio of the value and quantity is enough to reach the solution.

35. 2 Total value of distribution to Turkey is 16% of 5760 million Euro.
Total quantity of distribution to Turkey is 15% of 1.055 million tonnes.
So the average price in Euro per kilogram for Turkey is

$$\frac{\left(5760 \times \frac{16}{100}\right)}{\left(1055 \times \frac{15}{100}\right)} \simeq 5.6$$

36. 2 BC $\rightarrow$ AC $\rightarrow$ AAC = 0

37. 3 BD $\xrightarrow{0}$ AE $\xrightarrow{95.2}$ AAB
$\therefore$ Least cost of sending one unit from any refinery to AAB
= 0 + 95.2 = 95.2.

38. 2 BB $\rightarrow$ AB $\rightarrow$ AAG = 311.1
Same as above.

39. 1 First we will have to check the minimum cost for receiving at AAA. This is 0 for AE. But, BB to AE is very high. Next is AC [314.5]. BB to AC is 451.1. After AC, the others are high. Hence, 314.5 + 451.1 = 765.6 is the least cost.

40. 4 Number of refineries = 6
Number of depots = 7
Number of districts = 9
Therefore, number of possible ways to send petrol from any refinery to any district is 6 × 7 × 9 = 378.

41. 2 The highest cost is for the route
BE $\rightarrow$ AE $\rightarrow$ AAH = 2193.0

For questions 42 to 47:

Position of States (Rank)	Year					
	96-97	97-98	98-99	99-00	00-01	
1	MA	MA	MA	MA	MA	
2	TN	TN	TN	TN	TN	
3	GU	AP	AP	AP	AP	
4	AP	GU	GU	GU	UP	} changed twice
5	KA	UP	UP	UP	GU	} changed twice
6	UP	KA	KA	KA	KA	
7	WB	WB	WB	WB	WB	

42. 2 From above table, we can conclude that option (2) is correct.

43. 2 On referring to the table, we can see that UP is the state which changed its relative ranking most number of times.

44. 4 We can say directly on observing the graph that the sales tax revenue collections for AP has more than doubled from 1997 to 2001.

45. 3 Growth rate of tax revenue can be calculated as:
(Sales tax revenue of correct year – Sales tax revenue of previous year)

For year 1997-98 $\frac{7826-7290}{7826} = 0.068$

For year 1998-99 $\frac{8067-7826}{7826} = 0.030$

For year 1999-2000 $\frac{10284-8067}{8067}$ = 0.274

For year 2000-01 $\frac{12034-10284}{10284}$ = 0.170

46. 1 For increase by the same amount for 2 successive years, eliminate the options by subtracting only the last digit.
For Karnataka, increase in 2000-01 is 5413 – 4839 = 574 and increase in 1999-2000 is 4839 – 4265 = 574.
Hence, (1) is the correct option.

47. 3 On referring to the table, we can see that Tamil Nadu has been maintaining a constant rank over the years in terms of its contribution to total tax collections.

48. 2 Only R9 is that region which produces medium quality of crop – 2 and low quality of crop – 4.

49. 4 Statement (1) is not satisfied by R9.
Statement (2) is not satisfied by R3.
Statement (3) is incorrect as there are six such regions R1, R2, R3, R4, R9 and R11.
Statement (4) is correct.

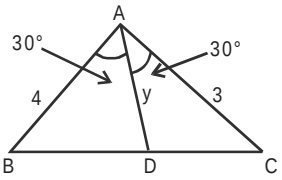
50. 3 Three regions namely R9, R10 and R11.

51. 3 Total possible arrangements = 10 × 9 × 8
Now 3 numbers can be arranged among themselves in 3! ways = 6 ways
Given condition is satisfied by only 1 out of 6 ways.
Hence, the required number of arrangements

$= \frac{10\times9\times8}{6} = 120$

Alternate solution:
$^{10}C_3 = 120$
Any three numbers selected out of 10 numbers will have only one possible arrangement.

52. 2



Let BC = x and AD = y.

As per Bisector Theorem, $\frac{BD}{DC} = \frac{AB}{AC} = \frac{4}{3}$

Hence, BD = $\frac{4x}{7}$; DC = $\frac{3x}{7}$

In ΔABD, $\cos30^\circ = \frac{(4)^2 + y^2 - \frac{16x^2}{49}}{2\times4\times y}$

$\Rightarrow 2\times4\times y\times\frac{\sqrt{3}}{2} = 16 + y^2 - \frac{16x^2}{49}$

$\Rightarrow 4\sqrt{3}y = 16 + y^2 - \frac{16x^2}{49}$ ... (i)

Similarly, from ΔADC, $\cos30^\circ = \frac{9 + y^2 - \frac{9x^2}{49}}{2\times3\times y}$

$\Rightarrow 3\sqrt{3}y = 9 + y^2 - \frac{9x^2}{49}$ ... (ii)

Now (i) × 9 – 16 × (ii), we get

$36\sqrt{3}y - 48\sqrt{3}y = 9y^2 - 16y^2 \Rightarrow y = \frac{12\sqrt{3}}{7}$

Alternate solution:

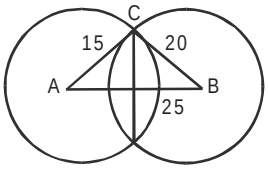
Area of ΔABC = Area of Δ ABD + Area of Δ ADC

$\Rightarrow \frac{1}{2}\times4\times3\sin60^\circ = \frac{1}{2}\times4\times y\sin30^\circ + \frac{1}{2}\times3\times y\times\sin30^\circ$

$\Rightarrow 12\sqrt{3} = 4y + 3y$

$\Rightarrow y = \frac{12\sqrt{3}}{7}$

53. 1



Let the length of the chord be x cm

$\therefore \frac{1}{2}(15\times20) = \frac{1}{2}\times25\times\frac{x}{2} \Rightarrow x = 24$ cm

54. 2 $f(x) + f(y) = \log\left(\frac{1+x}{1-x}\right) + \log\left(\frac{1+y}{1-y}\right)$

$= \log\left(\frac{(1+x)\ (1+y)}{(1-x)(1-y)}\right)$

$= \log\left(\frac{1+x+y+xy}{1+xy-x-y}\right)$

$= \log\left(\frac{1+xy+x+y}{1+xy-(x+y)}\right)$

$= \log\left(\frac{1+\left(\frac{x+y}{1+xy}\right)}{1-\left(\frac{x+y}{1+xy}\right)}\right)$

$= f\left(\frac{x+y}{1+xy}\right)$

55. 1 Total area = 14 × 14 = 196 m^2

Grazed area = $\left(\frac{\pi \times r^2}{4}\right) \times 4 = \pi r^2 = 22 \times 7 (r = 7)$

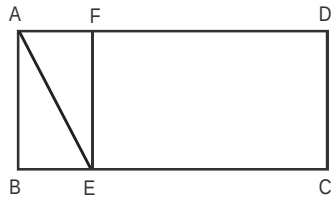
$= 154\ m^2$

Ungrazed area is less than (196 – 154) = 42 m^2, for which there is only one option.

56. 4 Every trip will need more than 180 m and there are $4\frac{1}{2}$ trips. Hence, the distance covered will be greater than 750 m, for which there is only one option = 860.

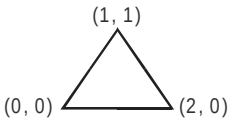
Alternative method:
For the first stone, he will cover 100 m.
For second, 200 – 4 = 196 m
For third, 200 – 8 = 192 m
For fourth, 200 – 12 = 188 m
For fifth, 200 – 16 = 184 m
Hence, total distance = 860 m

57. 4



Area of ΔABE = 7 cm^2
Area of rectangle ABEF = 14 cm^2
∴ Area of ABCD = 14 × 4 = 56 cm^2

58. 2



Let a = 0

Hence, area = $\frac{1}{2}(2)\ (1) = 1$

Note: Answer should be independent of a and area of the triangle does not have square root.

59. 4 Check choices, e.g. $\frac{1}{2} \Rightarrow$ Diagonal = $\sqrt{5}$

Distance saved = $3 - \sqrt{5} \approx 0.75 \neq$ Half the larger side. Hence, incorrect.

$\frac{3}{4} \Rightarrow$ Diagonal = 5

Distance saved = (4 + 3) – 5 = 2 = Half the larger side.

60. 4 If speed of N = 4, speed of S = 1,

$\Rightarrow$ Average speed = $\frac{2 \times 4 \times 1}{4+1} = 1.6$

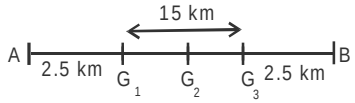
Because time available is $\frac{2}{3}$, speed = $\frac{3}{2}$

Now average speed = 2.4
Now speed of N = 8
Now speed of S = y

$\frac{2 \times 8 \times y}{8+y} = 2.4 \Rightarrow y = 1.3$

Required ratio = 1.3 : 8 $\approx$ 1 : 6

61. 3



Let G_1, G_2 and G_3 be the three gutters such that $G_2G_3 = 2\,G_1G_2$.
AG_1 = 5 min × 30km/hr = 2.5 km
∴ $G_1\,G_3$ = 20 – 2 × 2.5 = 15 km
Time taken to cover AG_1 = 5 min
Time taken to cover ($G_1G_3 + G_3A$)

$= \frac{(15+17.5)\text{km}}{2 \times 30\ \text{km/hr}} = \frac{32.5}{60} \times 60 = 32.5$ minutes

The patient reaches the hospital in a total of (32.5 + 5) = 37.5 minutes
Maximum time that the doctor gets to attend the patient = 40 – 37.5 – 1 = 1.5 minutes.

62. 2 Check choices
Choice (2) 54 $\Rightarrow$ S = $(5 + 4)^2$ = 81
$\Rightarrow$ D – S = 81 – 54 = 27. Hence, the number = 54

63. 4 $x_0 = x$
$x_1 = -x$
$x_2 = -x$
$x_3 = x$
$x_4 = x$
$x_5 = -x$
$x_6 = -x$
……
$\Rightarrow$ Choices (1), (2), (3) are incorrect.

64. 3 $xy + yz + zx = 3$

$\Rightarrow xy + (y + x)z = 3$

$\Rightarrow xy + (y + x)(5 - x - y) = 3$

$\Rightarrow x^2 + y^2 + xy - 5x - 5y + 3 = 0$

$\Rightarrow y^2 + (x - 5)\,y + x^2 - 5x + 3 = 0$

As it is given that y is a real number, the discriminant for above equation must be greater than or equal to zero.

Hence, $(x-5)^2 - 4(x^2 - 5x + 3) \geq 0$

$\Rightarrow 3x^2 - 10x - 13 \leq 0$

$\Rightarrow 3x^2 - 13x + 3x - 13 \leq 0$

$\Rightarrow x \in \left[-1, \frac{13}{3}\right]$

Largest value that x can have is $\frac{13}{3}$.

65. 3 Area = 40 × 20 = 800
If 3 rounds are done, area = 34 × 14 = 476
$\Rightarrow$ Area > 3 rounds
If 4 rounds $\Rightarrow$ Area left = 32 × 12 = 347
Hence, area should be slightly less than 4 rounds.

66. 2 Since thief escaped with 1 diamond,
Before 3rd watchman he had (1 + 2) × 2 = 6
Before 2nd watchman he had (6 + 2) × 2 = 16
Before 1st watchman he had (16 + 2) × 2 = 36

67. 2 Mayank paid $\frac{1}{2}$ of the sum paid by other three.

$\Rightarrow$ Mayank paid $\frac{1}{3}$rd of the total amount = \$20.

Similarly, Mirza paid \$15 and Little paid \$12.
Remaining amount of \$60 – \$20 – \$15 – \$12 = \$13 is paid by Jaspal.

68. 4 Let the number of gold coins = x + y
$\therefore 48(x - y) = x^2 - y^2$
$\Rightarrow 48(x - y) = (x - y)(x + y) \Rightarrow x + y = 48$
Hence, the correct choice will be none of these.

69. 3 Let's assume that
p days : they played tennis
y days : they went for yoga
T days : total duration for which Ram and Shyam stayed together
$\Rightarrow p + y = 22$
$(T - y) = 24$ and $(T - p) = 14$
Adding all of them,
$2T = 22 + 24 + 14 \Rightarrow T = 30$ days.

70. 1 Coefficient of $x^n = \frac{1}{2}(n+1)(n+4)$

$S = 2 + 5x + 9x^2 + 14x^3 + ...$

$xS = 2x + 5x^2 + ...$

$S(1-x) = 2 + 3x + 4x^2 + 5x^3 + ...$

Let $S_1 = S(1-x) \Rightarrow S_1 = 2 + 3x + 4x^2 + ...$

$xS_1 = 2x + 3x^2 + ...$

$S_1(1-x) = 2 + x + x^2 + ...$

$S_1(1-x) = 2 + \frac{x}{1-x}$

$S(1-x^2) = 2 + \frac{x}{1-x} \Rightarrow S = \frac{2-x}{(1-x)^3}$

71. 3 $x^2 + 5y^2 + z^2 = 4yx + 2yz$

$(x^2 + 4y^2 - 4yx) + z^2 + y^2 - 2yz = 0$

$(x - 2y)^2 + (z - y)^2 = 0$

It can be true only if x = 2y and z = y

72. 2 Let the number of ab.
Arithmetic mean is more by 1.8 means sum is more by 18.
$\therefore (10b + a) - (10a + b) = 18$
$\Rightarrow 9(b - a) = 18$
$\Rightarrow b - a = 2$

73. 3 By trial and error:
30 × 12 = 360 > 300
30 × 7.5 = 225 < 300
50 × 6 = 300. Hence, he rented the car for 6 hr.

74. 4 $575 = \frac{n^2 + n}{2} - x$

$1150 = n^2 + n - 2x$

$n(n+1) \geq 1150$

$n^2 + n \geq 1150$

The smallest value for it is n = 34.
For n = 34
$40 = 2x \Rightarrow x = 20$

75. 4 $x - 1 \leq [x] \leq x$

$2x + 2y - 3 \leq L(x,y) \leq 2x + 2y \Rightarrow a - 3 \leq L \leq a$

$2x + 2y - 2 \leq R(x,y) \leq 2x + 2y \Rightarrow a - 2 \leq R \leq a$

Therefore, $L \leq R$

Note: Choice (2) is wrong, otherwise choice (1) and choice (3) are also not correct. Choose the numbers to check.

76. 1 Number of regions = $\frac{n(n+1)}{2} + 1$, where n = Number of lines, i.e. for 0 line we have region = 1.
For 1 line we have region = 2.
It can be shown as:

Number of lines	0	1	2	3	4	5	…	10
Number of regions	1	2	4	7	11	16	…	56

Therefore, for n = 10, it is $\frac{10 \times 11}{2} + 1 = 56$

77. 1 $\left(2^4\right)^{64} = (17-1)^{64} = 17n + (-1)^{64} = 17n + 1$

Hence, remainder = 1

78. 4 $\frac{A^2}{x} + \frac{B^2}{x-1} = 1 \Rightarrow A^2(x-1) + B^2x = x^2 - x$

When one of A or B is zero, it will be a linear equation which will have one real root. When both A and B are non-zero, it will be a quadratic equation which can have two real roots.

79. 2 Since each word is lit for a second, least time after which the full name of the bookstore can be read again

$$= \text{LCM}\left(\frac{5}{2}+1, \frac{17}{4}+1, \frac{41}{8}+1\right) = \text{LCM}\left(\frac{7}{2}, \frac{21}{4}, \frac{49}{8}\right)$$

$$\frac{\text{LCM}(7,21,49)}{\text{HCF}(2,4,8)} = \frac{49\times 3}{2} = 73.5\,\text{s}$$

80. 4 $\text{HCF}\left(\frac{9}{2}, \frac{27}{4}, \frac{36}{5}\right) = \frac{\text{HCF}(9, 27, 36)}{\text{LCM}(2, 4, 5)} = \frac{9}{20}$ lb

= Weight of each piece

Also, total weight of three pieces of cakes = 18.45 lb

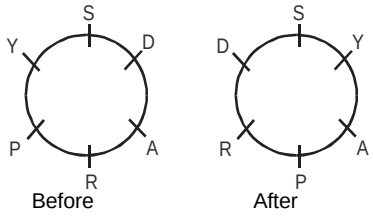
$\therefore$ Maximum number of guests that could be entertained

$= \frac{18.45 \times 20}{9} = 41$

81. 4 3(4(7x + 4) + 1) + 2 = 84x + 53

Therefore, remainder is 53.

82. 3



Suresh is sitting to the left of Dhiraj.

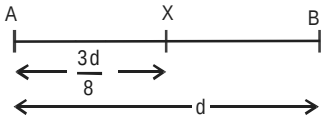
83. 4 Number of oranges at the end of the sequence
= Number of 2s – Number of 4s = 6 – 4 = 2

84. 3 Number of (1s + 2s + 3s) – 2(Number of 4s) = 19 – 8
= 11

85. 1 11 × 10 × 9 × 8 = 7920

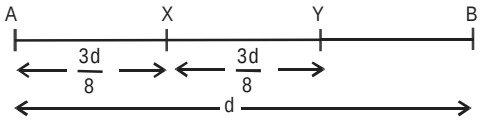
86. 3 Total number of passwords with atleast 1 symmetric letter
= Total number of passwords using all letters – Total number of passwords using no symmetric letters
= (26 × 25 × 24) – (15 × 14 × 13) = 12870

87. *2 AB is the tunnel and 'd' km be its length.



Let the current position of the cat be X. If it runs towards A, it would reach A at the same time as the train reaches A.

However, if it runs towards the other end B, it would reach point Y at the same time when the train reaches A. Hence, point Y would be at a distance of $\frac{3d}{8}$ km from X



As the cat and the train would reach B simultaneously, the cat would cover the rest $\frac{2d}{8} = \frac{d}{4}$ km distance in the same time that the train takes to cover the whole tunnel i.e. d km.

Therefore, the speed of the train = 4 × the speed of the cat

Hence, ratio of the speeds of the train and cat is 4 : 1.

*** The language in the question is slightly ambiguous**. A possible interpretation is that the ratio of their speeds is to be determined which is correctly 4 : 1.

88. 3 Let the largest piece = 3x

Middle = x

Shortest = 3x – 23

$\therefore$ 3x + x + (3x – 23) = 40

$\Rightarrow$ x = 9

$\therefore$ the shortest piece = 3(9) – 23 = 4

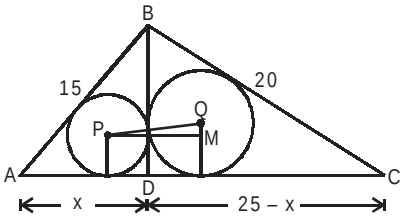
89. 2 Each traveller had $\frac{8}{3}$ loaves.

$\Rightarrow$ First traveller has given $5 - \frac{8}{3}$ loaves to the third.

Second traveller sacrificed only $3 - \frac{8}{3} = \frac{1}{3}$rd of a loaf.

So, first should get 7 coins.

90. 2



$(15)^2 - x^2 = (20)^2 - (25 - x)^2$

$\Rightarrow x = 9$

$\Rightarrow BD = 12$

Area of $\Delta ABD = \frac{1}{2} \times 12 \times 9 = 54$

$s = \frac{1}{2}(15 + 12 + 9) = 18$

$r_1 = \frac{\text{Area}}{s} \Rightarrow r_1 = 3$

Area of $\Delta BCD = \frac{1}{2} \times 16 \times 12 = 96$

$s = \frac{1}{2}(16 + 20 + 12) = 24$

$r_2 = \frac{\text{Area}}{s} \Rightarrow r_2 = 4$

In ΔPQM, $PM = r_1 + r_2 = 7$ cm

$QM = r_2 - r_1 = 1$ cm

Hence, $PQ = \sqrt{50}$ cm

91. 4 $u^m + v^m = w^m$

$u^2 + v^2 = w^2$

Taking Pythagorean triplet 3, 4 and 5, we see that m < min (u, v, w).

Also, 1' + 2' = 3' and hence, m $\leq$ min (u, v, w).

92. 4 A black square can be chosen in 32 ways. Once a black square is there, you cannot choose the 8 white squares in its row or column. So the number of white squares availbale = 24

Number of ways = 32 × 24 = 768

93. 4 $7^{6n} - 6^{6n}$

Put n = 1.

$7^6 - 6^6 = (7^3 - 6^3)(7^3 + 6^3)$

This is a multiple of $7^3 - 6^3 = 127$ and $7^3 + 6^3 = 559$ and 7 + 6 = 13. Hence, all of these is the right answer.

94. 3 Given pqr = 1 $\Rightarrow$ $pq = \frac{1}{r}$ and $\frac{1}{p} = qr$

$$\frac{1}{1+p+q^{-1}} + \frac{1}{1+q+r^{-1}} + \frac{1}{1+r+p^{-1}}$$

$$= \frac{q}{1+q+pq} + \frac{r}{1+qr+r} + \frac{1}{1+r+qr}$$

$$= \frac{qr}{1+qr+r} + \frac{r}{1+qr+r} + \frac{1}{1+r+qr} = \frac{1+r+qr}{1+r+qr} = 1$$

Alternate solution: Putting x = y = z = 1, we get

$$\frac{1}{1+p+q^{-1}} + \frac{1}{1+q+r^{-1}} + \frac{1}{1+r+p^{-1}}$$

$$= \frac{1}{1+1+1} + \frac{1}{1+1+1} + \frac{1}{1+1+1}$$

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

95. 4 Total amount of work = 60 man-hours
From 11 am to 5 pm, 6 technicians = 36 man-hours
From 5 pm to 6 pm, 7 technicians = 7 man-hours
From 6 pm to 7 pm, 8 technicians = 8 man-hours
From 7 am to 8 pm, 9 technicians = 9 man-hours
Total = 60 man-hours

96. 2 Number of samosas = 200 + 20n, n is a natural number.
Price per samosa = Rs.(2 – 0.1n)
Revenue = (200 + 20n)(2 – 0.1n) = 400 + 20n – $2n^2$
= 450 – 2 $(n - 5)^2$
Revenue will be maximum if n – 5 = 0
$\Rightarrow$ n = 5
$\therefore$ Maximum revenue will be at (200 + 20 × 5)
= 300 samosas

97. 2 Three small pumps = Two large pumps

Three small + One large pumps = Three large pump

$\therefore \frac{1}{3}$ rd of total time is taken by the large pump alone.

98. 4 If KL = 1, then IG = 1 and FI = 2

Hence, $\tan\theta = \frac{2}{1} = 2$

Thus, θ none of 30, 45 and 60°.

99. 3 Area of quadrilateral $ABCD = \frac{1}{2}(2x + 4x) \times 4x = 12x$

Area of quadrilateral $DEFG = \frac{1}{2}(5x + 2x) \times 2x = 7x$

Hence, ratio = 12 : 7

100. 3 Number of ways for single digit = 2
2 digits = 2 × 3 = 6
3 digits = 2 × 3 × 3 = 18
4 digits = 2 × 3 × 3 × 3 = 54
5 digits = 2 × 3 × 3 × 3 × 3 = 162
6 digits = 2 × 3 × 3 × 3 × 3 × 3 = 486
Total = 728

101. 3 The size of the pitch is the usage of measure.
The vessel is used to take out a litre of oil.
Action against tresspassers was instituted in the campus.
Sheila ascertained the measurement of each item.

102. 2 Dinesh could not stand the discussion and he was forced to walk out.
Vidya's story is the limit, very hard to believe.
Jyoti wanted to go to the Bar.
The forces were such that he was certain to go over the edge.

103. 4 Hussain tried to capture the spirit of India in this painting (on the canvas).
Sorry, I could not understand what you just said.
Is there some deception (vanishing act) in this proposal?
All her friends agreed that Prakash was a person worth entrapping in the snares of romance.

104. 2 I decided not to do business in handmade cards.
My brother is a trader of cards.
Dinesh insisted on giving out the cards to the players.
This contract is concerned with handmade cards.

105. 4 Ashish asked Laxman to turn his face in a new direction.
Leena never sent a beggar away without offering anything.
The old school building has taken the form of a museum.
Now he had the opportunity to voice his protest.

106. 3 The reason why the demand for branded diapers may be price-sensitive is given in A. This is supported by DB. C contrasts, supported by the example in E. F can be linked with private-labels.

107. 1 (3) is a haphazard choice with no definite beginning, middle or end. Discipline goes better with strong focus as in AC. E further elaborates. DBF talks about making strategy foolproof through the value chain.

108. 3 B starts the paragraph. C is too abrupt to follow. E links job to ambassador in A. Ambivalence in D is illustrated in C.

109. 4 Only E can start the paragraph. C continues with the temporal reference and mentions division between 2 parties.

110. 2 Given B, E cannot start the paragraph. Rather, E follows with the question. D offers an answer to E. C supports with facts. A ends with the discoverers of the fact.

111. 3 Obviously is the right answer as it matches the tone of great simplifications.

112. 1 Numerical value in the earlier paragraph points to quantitatively as the answer.

113. 4 Assess alternatives that follows the blank gives the answer alternatives.

114. 3 The passage deals with firing employees.

115. 1 Resolve means to find a solution to something.

116. 4 The failed product would not be present had it not passed through the process.

117. 3 This is a simple question of parallelism, not that it is ... but that it is.

118. 2 You generate money through deals, and not by deals or on deals. The two factors — escalated costs and black money — are lucidly given in (2).

119. 3 We always have to use the conjunction between to compare prices at two levels.

120. 2 Reduce and encourage will make a parallel construction. Action is taken by someone, not of someone.

121. 1 Opprobrium is the state of being abused or scornfully criticized.

122. 4 Portend means to predict or foreshadow.

123. 1 Prevaricate means to speak evasively with intent to deceive.

124. 3 Restive means to be restless or nervous.

125. 1 Ostensible means what is apparent or seeming to be the situation.

126. 3 Refer 2nd para, especially to the part: 'Then Indian historians trained in … mainly political.'

127. 2 (1), (3) and (4) seem to be superficial answers. (2) matches the syntax of the statement given in the question.

128. 3 Refer to the part glamour departed from politics.

129. 4 (4) is mentioned as a desirable characteristic towards the end of the passage.

130. 1 In (1), the writers and their respective approaches are correctly matched as per the information given in the passage.

131. 1 Refer to the part abortion access when their countries were perceived to have an overpopulation problem.

132. 4 (1), (2) and (3) are stated towards the end of the second paragraph and the beginning of the third paragraph.

133. 4 (1), (2) and (3) are too far-fetched and find no place in the passage.

134. 4 (1) need not be necessarily true as an inference. (2) and (3) are explicitly stated towards the end of the penultimate paragraph.

135. 2 Refer towards the end of the fourth paragraph. (2) comes closest to what the writer wants to say.

136. 4 (1), (2) and (3) find no place in the passage to support the pro-choice lobby.

137. 2 Simple. Just read the last line of the passage.

138. 2 (1), (3) and (4) are factually incorrect as per information given in the 3rd paragraph. (2) comes closest to the central idea in the third paragraph.

139. 4 The writer does not harbour a very favorable view of theologians, refer to all too definite.

140. 4 (1), (2) and (3) take the form of questions raised by the writer in the course of the passage.

141. 4 Refer towards the end of the second paragraph.

142. 1 Refer to inside of a cell bustles with more traffic and polymers, along which bundles of molecules travel like trams.

143. 1 Refer to 'The dynein motor ... is still poorly understood and without motor proteins. Our muscles wouldn't contract'.

144. 2 Refer to the part without motor proteins ... We couldn't grow and these particles create an effect that seems to be so much more than the sum of its parts.

145. 1 Refer to the part three families of proteins, called myosin, kinesin and dynein and the growth process requires cells to duplicate their machinery and pulls the copies apart.

146. 3 Refer to the part They think for us and is giving the language a lot of responsibility.

147. 4 (4) does not qualify as rhetoric on the basis of information given in the fourth paragraph. Commands are, at best, staid.

148. 3 (1), (2) and (4) cannot qualify as an answer as they sound extreme or implausible. (3) comes closest to what the writer would like to suggest.

149. 1 Arcane in the context of usage in the passage means esoteric.

150. 3 Refer to the part bringing scholars to accept the better argument and reject the worse.