

**Ref: AIMCAT1101**

**INSTRUCTIONS**

1. Read the instructions given at the beginning/end of each section or at the beginning of a group of questions very carefully.
2. This test has three sections with 60 questions – 20, 20, and 20 respectively in the first, second and third sections. The TOTAL TIME available for the paper is 135 minutes. The student may apportion this time among various sections as he/she wishes. However, the student is expected to show his/her competence in all the three sections.
3. All questions carry three marks each. Each wrong answer will attract a penalty of one mark.

**SECTION – I**  
**Number of Questions = 20**

**DIRECTIONS for questions 1 to 20:** Answer the questions independently of each other.

1. If  $a$ ,  $b$ ,  $c$  and  $d$  are four distinct natural numbers, each of which has exactly five factors, find the number of factors of the product of  $a$ ,  $b$ ,  $c$  and  $d$ .
 

(1) 17	(2) 256
(3) 625	(4) Cannot be determined
2. The minimum number of straight lines required to obtain 16 non-overlapping parallelograms is
 

(1) 8	(2) 10	(3) 17	(4) 7
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3. Which of the following is the most appropriate range of values of  $k$  for which the lines  $3x + y = 7$  and  $kx - 4y = 2$  intersect in the first quadrant?
 

(1) $k > \frac{7}{6}$	(2) $k > \frac{6}{7}$	(3) $k > \frac{3}{7}$	(4) $k > \frac{7}{3}$
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4. The income of A is Rs.15,000 and it is equal to the expenditure of B. If the ratio of the savings of A to the savings of B is 2 : 1, which of the following statements is definitely true?
 

(1) The combined income of A and B is more than Rs.45,000.
(2) The combined expenditure of A and B is not less than Rs.20,000.
(3) A's expenditure added to twice of B's income is equal to Rs.45,000.
(4) B's expenditure added to twice of A's income is equal to Rs.30,000.
5. Two persons A and B started running simultaneously from a point P, around a circular track of length 1000 m, in opposite directions, with speeds of 4 m/s and 1 m/s respectively. The moment they crossed each other, two more persons, C and D, started from P towards A and B respectively, C running around the track in the direction opposite to A, with a speed of 1 m/sec and D running around the track, in the direction opposite to B, with a speed of 4 m/sec. Which of the following is a possible time when A, B, C and D will all meet at the same point on the track? (Assume that they continue indefinitely to run around the track in their respective directions).
 

(1) 60 minutes	(2) 30 minutes
(3) 48 minutes	(4) It never happens
6. If  $f(x) = \frac{2x^2 - 5}{2x^2 + 1}$ , then the minimum value of  $f(x)$  is
 

(1) 6	(2) 0	(3) -6	(4) -5
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7. In the figure below, point E is the centre of the square ABCD of side 3 cm. EFGH is a square of side 4 cm. EF intersects BC at X such that  $BX = (1/5)XC$ . Find the area (in sq.cm) of the shaded region EXCY.
 

(1) 9/4	(2) 9/2	(3) 4	(4) 8
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8. P and Q are the centres of two circles intersecting at R and S. If PR = 26 cm, QR = 30 cm and PQ = 28 cm, find the length (in cm) of the common chord of the two circles.
 

(1) 40	(2) 42	(3) 48	(4) 50
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9.  $1 \cdot 1! + 2 \cdot 2! + 3 \cdot 3! + \dots + n \cdot n! =$ 

(1) $(n+1)!$	(2) $(n+1)! - 1$
(3) $(n!)^2 - 1$	(4) $(n+1)! - n$
10. If N is the number of ways of dividing 500 students into five distinctly identifiable sections of 100 students each, how many zeros does N end with?
 

(1) 0	(2) 2	(3) 5	(4) 4
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11. The decimal equivalent of  $(123.21)_4$  is
 

(1) 27.2625	(2) 27.0625
(3) 27.5625	(4) None of these
12. At how many points does the graph  $y = ||x - 5| - 14| - 6$  touch the x-axis?
 

(1) 1	(2) 2	(3) 3	(4) 4
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13. Mohit can do a work in 20 days, while Rohit can do the same work in 30 days. Together, they completed a certain work, where Mohit started the work on the first day and on any day exactly one of them worked. If they divided the money they earned for the work in the ratio 1 : 1, in how many days was the work completed?  
 (1) 24 days      (2) 25 days  
 (3) 26 days      (4) Cannot be determined

14. A quadratic expression  $f(x) = ax^2 + bx + c$  is such that  $f(-2) < 4$ ;  $f(2) > -4$  and  $f(3) < -11$ . Which of the following is always true?  
 (1)  $a < -2$     (2)  $a < -1$     (3)  $a > 1$     (4)  $a > 2$

15. A rectangular grid consists of several vertical lines, with the distance between any pair of adjacent vertical lines being 1 cm, and several horizontal lines, with the distance between any pair of adjacent horizontal lines being  $\sqrt{2}$  cm. From among the grid points (i.e., the points of intersection of the grid lines), three points – A, B and C – are chosen at random. If  $BC = a$  cm,  $CA = b$  cm and  $AB = c$  cm, which of the following statements cannot be true?  
 I. Each of  $a, b, c$  (in cm) is rational.  
 II. The area (in sq.cm) of  $\triangle ABC$  is of the form  $p + q\sqrt{2}$ , where  $p$  and  $q$  are rational numbers and  $p \neq 0$ .  
 III. The area (in sq.cm) of  $\triangle ABC$  is of the form  $p\sqrt{2}$ , where  $2p$  is a whole number.  
 IV.  $a^3 + b^3 + c^3$  is equal to  $3abc$ .  
 (1) Only I and III    (2) Only I, III and IV  
 (3) Only III and IV    (4) Only II and IV

16. In a certain infinite geometric progression, the sum of any three consecutive terms equals 7 times the sum of all the terms that follow them. Find the ratio of any term of the progression to the sum of all the terms that follow it.  
 (1) 8 : 1    (2) 4 : 1    (3) 1 : 1    (4) 2 : 1

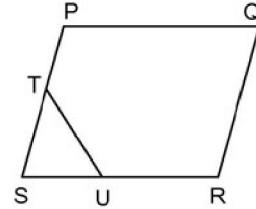
17. X, Y and Z are positive numbers. [N] denotes the integral part of N and {N} denotes the fractional part of N. If the following equations are given,

$$\begin{aligned}[X] + \{Y\} + [Z] &= 11.2 \\ [Y] + \{Z\} + [X] &= 10.3 \\ [Z] + \{X\} + [Y] &= 9.4\end{aligned}$$

find the value of  $[X + Y - Z]$ .

- (1) 4      (2) 5  
 (3) 6      (4) Cannot be determined

18. In the figure below, PQRS is a parallelogram, where  $SR = 2PS = 4PT$  and U is a point on SR. If  $\angle STU = \angle PRS$  and  $PT$  is 20 cm less than  $UR$ , find the perimeter (in cm) of PQRS.



- (1) 80    (2) 96    (3) 108    (4) 72

19. A dye company received an order of 400 litres of black dye and 360 litres of brown dye. It has two machines (X and Y) to make these dyes. X takes 4 hours to make 16 litres of black dye and 3 hours to make 9 litres of brown dye. Y takes 4 hours to make 12 litres of black dye and 3 hours to make 12 litres of brown dye. If the company has to deliver the order in 93 hours, its delivery will be delayed by at least

- (1)  $2\frac{1}{7}$  hours    (2)  $2\frac{2}{7}$  hours  
 (3)  $2\frac{4}{7}$  hours    (4)  $2\frac{5}{7}$  hours

20. Evaluate:

$$\begin{aligned}&\sqrt{1+\frac{1}{4}+\frac{2}{2}} + \sqrt{1+\frac{1}{36}+\frac{2}{6}} + \sqrt{1+\frac{1}{144}+\frac{2}{12}} + \sqrt{1+\frac{1}{400}+\frac{2}{20}} \\ &+ \sqrt{1+\frac{1}{900}+\frac{2}{30}} + \dots + \sqrt{1+\frac{1}{98010000}+\frac{2}{9900}} \\ (1) \quad &\frac{999999}{10000} \quad (2) \quad \frac{99999}{1000} \\ (3) \quad &\frac{9999999}{1000000} \quad (4) \quad \frac{9999}{100}\end{aligned}$$

## SECTION – II

**Number of Questions = 20**

**DIRECTIONS for question 21:** Each question is followed by two statements, A and B. Answer each question using the following instructions:

- Mark (1) if the question can be answered by using the statement A alone but not by using the statement B alone.  
 Mark (2) if the question can be answered by using the statement B alone but not by using the statement A alone.  
 Mark (3) if the question can be answered by using both the statements together but not by either of the statements alone.  
 Mark (4) if the question cannot be answered on the basis of the two statements.

21. Each of four friends – Sravan, Rajan, Pavan and Madan – is wearing one of four different coloured caps among red, green, blue and yellow, not necessarily in that order. Each of the friends either always tells the truth or always lies. Who is wearing the green coloured cap?

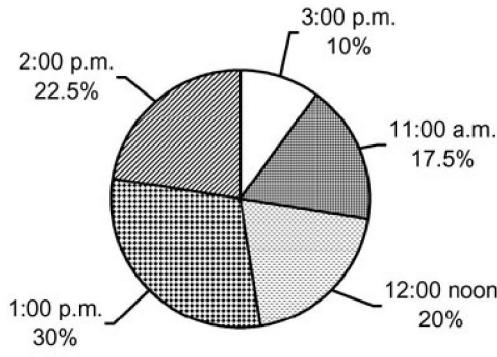
- A. Rajan says, "Neither Sravan nor Madan is wearing the green coloured cap".  
 B. Between Sravan and Pavan, exactly one always lies. Each of the four says that he is wearing the green coloured cap.

**DIRECTIONS** for questions 22 to 25: Answer the questions on the basis of the information given below.

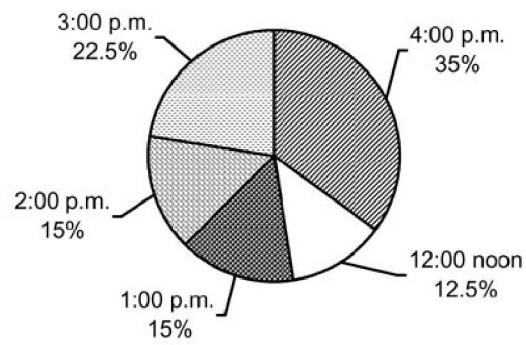
At a famous Wax museum, visitors are allowed to enter or exit the museum only once every hour. On any day the visitors can enter only at any of the five scheduled "let-in" timings – 11:00 a.m., 12:00 noon, 1:00 p.m., 2:00 p.m. and 3:00 p.m. and they can exit only at any of the five schedule "let-out" timings – 12:00 noon, 1:00 p.m., 2:00 p.m., 3:00 p.m. and 4:00 p.m.

The following pie charts give the distribution of all the 1200 visitors to the museum, on 15<sup>th</sup> August 2007. Pie chart - 1 shows the percentage distribution of the total number of visitors as per the time at which they entered the museum. Pie chart - 2 shows the percentage distribution of the total number of visitors as per the times at which they exited the museum. Each visitor stays in the museum for at least one hour and none of the visitors visits the museum more than once in the day.

Pie chart - 1



Pie chart - 2



22. Of the visitors who entered the museum or exited the museum at 1:00 p.m., the number of visitors who stayed in the museum for not more than two hours is at most  
(1) 240 (2) 360 (3) 480 (4) 540
23. The number of visitors who stayed in the museum for at least three hours, is at most  
(1) 240 (2) 300 (3) 360 (4) 420
24. A group of students of a college entered together and exited together. If it is known that the group stayed in the museum for at least two hours, what is the maximum possible number of students in that group?  
(1) 240 (2) 270 (3) 300 (4) 360
25. If the number of people who stayed in the museum for exactly two hours is  $x$ , the minimum and maximum possible values of  $x$  are  
(1) 150 and 660. (2) 0 and 600.  
(3) 150 and 720. (4) 0 and 720.

**DIRECTIONS** for questions 26 and 27: Answer the questions on the basis of the information given below.

The following table shows the sales of a company in different continents, as a percentage of the total annual sales of the company in all the continents put together, for each of the years 2001 to 2005.

(in percentages)

Continent \ Year	2001	2002	2003	2004	2005
North America	55	56	52	53	49
South America	4	5	7	10	15
Africa	3	4	5	6	7
Asia	12	15	10	11	9
Australia	6	8	10	12	14
Europe	20	12	16	8	6

The total annual sales of the company in 2001 were less than that in 2003, while the sales in 2002 were more than that in 2004.

26. The sales of the company in Asia in the year 2002 were  
(1) less than that in 2001.  
(2) more than that in 2003.  
(3) more than that in 2004.  
(4) more than that in 2005.
27. The number of continents in which the sales increased from 2001 to 2003 is at least  
(1) 1 (2) 2 (3) 3 (4) 4

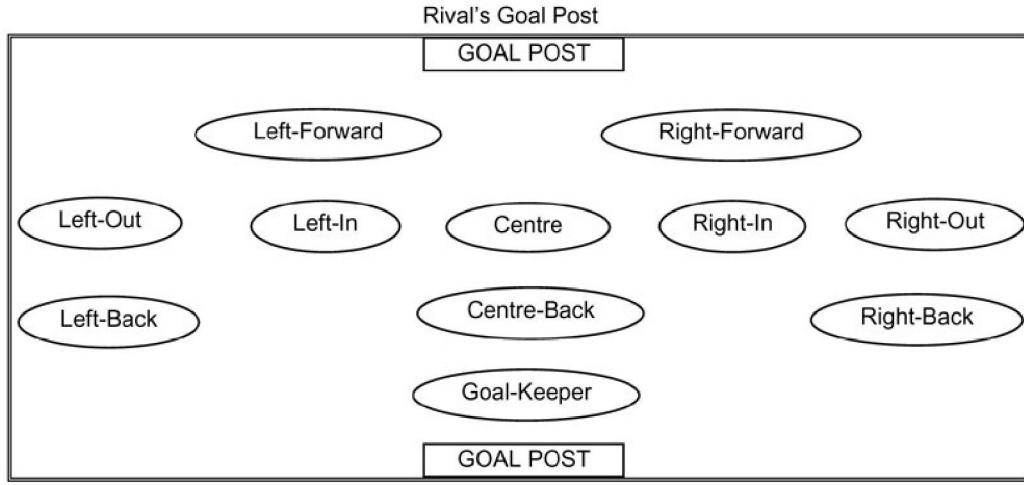
**DIRECTIONS** for question 28: Each question is followed by two statements, A and B. Answer each question using the following instructions:

- Mark (1) if the question can be answered by using the statement A alone but not by using the statement B alone.  
Mark (2) if the question can be answered by using the statement B alone but not by using the statement A alone.  
Mark (3) if the question can be answered by using both the statements together but not by either of the statements alone.  
Mark (4) if the question cannot be answered on the basis of the two statements.

28. Five persons – P, Q, R, S and T – are sitting in a row, each facing north, not necessarily in the same order. Are R and T next to each other?  
A. If P and T interchange their positions, then P will be to the immediate left of Q and T will be at the extreme right.  
B. If R and Q interchange their positions, then Q will be to the immediate left of S.

**DIRECTIONS** for questions 29 to 31: Answer the questions on the basis of the information given below.

Eleven players – A through K – of the East Bengal Football Team are practicing on a football field. The following figure shows the manner in which their positions are laid out.



**The Field lay-out of the East Bengal football team.**

**Note :**

1. The players are arranged upon an imaginary grid of 4 rows x 5 columns.
2. All players are facing the rival's goal post.
3. All directions are with respect to the East Bengal team's Goal-Keeper.

Also, it is known that:

- (a) Neither A nor B is in the same column as the Left-Out or the Right-Back.
- (b) The Goal-Keeper is in the same column as I, who is neither in the same column as D nor in the same row as F or K.
- (c) E and F must be in the same row.
- (d) C and H are in the same column.
- (e) G and J are in the same column.
- (f) E and K are in the same column.
- (g) None of A, B or I is the Goal-Keeper.
- (h) B and F are in the same column.
- (i) G and C are in the same row and C is the fourth person to the left of G while E and D are in the same row and D is to the immediate left of E.

Also, it is known that the football is initially with the Goal-Keeper, and one can pass it only to a player who is either horizontally or vertically next to him. The goals are scored only by either of the two Forwards.

**29. Who is the Goal-Keeper?**

- |       |                   |
|-------|-------------------|
| (1) K | (2) F             |
| (3) J | (4) None of these |

**30. In how many different ways can a goal be scored, if the ball is initially passed by the Goal-Keeper, and no person gets the ball twice during any goal scored?**

- |       |       |       |        |
|-------|-------|-------|--------|
| (1) 4 | (2) 6 | (3) 8 | (4) 12 |
|-------|-------|-------|--------|

**31. Which of the following statements must be true?**

- |   |
|---|
| (1) J is the Right-Back and C is the Left-Back. |
|---|

- (2) A is the Left-Forward and I is the Centre.
- (3) F is the Right-In and D is the Left-In.
- (4) None of the above

**DIRECTIONS** for questions 32 to 35: Answer the questions on the basis of the information given below.

As part of an athletic meet of the corporate employees, the contestants had to cover an obstacle course of length 1000 metres, in which the difficulty level increases with an increase in the distance covered. In the event, for any person, the points are awarded depending on the respective value of D, i.e., the distance covered (in metres) by that person, and are as follows:

Range	Value of D	Points awarded
Range 1	1 to 100	D
Range 2	101 to 200	1.5 D – 50
Range 3	201 to 300	2 D – 150
Range 4	301 to 400	3 D – 450
Range 5	401 to 500	4 D – 850
Range 6	501 to 600	5 D – 1350
Range 7	601 to 1000	6 D – 1950

**Note :** For example, if D = 150, points awarded  
 $= 1.5 \times 150 - 50 = 175$ .

- (i) Assume that for any person, the respective value of D, i.e., the distance covered, in metres, is an integer.
- (ii) For any person, if the number of points obtained is not an integer, then it is rounded off to the next highest integer.
32. If the distance (in metres) covered by a person is between 450 and 650 (both inclusive), which of the following ranges most accurately describes the number of points that he could have scored?  

(1) 1550 to 2750	(2) 900 to 1900
(3) 850 to 1700	(4) 950 to 1950

33. If a person scored less than half of the maximum possible total number of points, the distance (in metres) that he covered is at most  
(1) 620    (2) 662    (3) 715    (4) 752

34. If it is known that the range of the value of D for a certain person X is immediately next to that of another person Y, and neither X nor Y covered more than 600 m, what is the maximum possible difference in the points scored by them?  
(1) 512    (2) 558    (3) 812    (4) 896

35. Of the given seven ranges of D, the number of ranges for which the number of points scored by any person in that range can be more than 1.5 times the number of points scored by another person in the same range, is at most  
(1) 2    (2) 4    (3) 5    (4) 6

**DIRECTIONS** for question 36: Each question is followed by two statements, A and B. Answer each question using the following instructions:

**Mark (1) if the question can be answered by using the statement A alone but not by using the statement B alone.**

**Mark (2) if the question can be answered by using the statement B alone but not by using the statement A alone.**

**Mark (3) if the question can be answered by using either  
of the statements alone.**

**Mark (4) if the question can be answered by using both**

**Mark (4) if the question can be answered by using both the statements together but not by either of the statements alone.**

36. Only democrats can contest in the elections. All democrats are educated. Only US citizens can contest in the elections. Can Mr. X contest in the elections?  
A. Mr. X is an US Citizen.  
B. Mr. X is not educated.

**SECTION – III**  
**Number of Questions = 20**

**DIRECTIONS** for questions 41 to 43: Read the following passage and answer the questions that follow it.

Ten years ago, the human genome was medicine's Holy Grail. Playing the part of King Arthur's knights were rival teams of biologists racing to sequence all the genetic instructions required to make a human being. And just as the actual Holy Grail was believed to have miraculous healing powers, some promised that the genome would change medicine forever. Biotech companies raced to cash in—Human Genome Sciences, for instance, filed patents on 100,000 genes and, in 1999, saw its stock quadruple. But genomic science didn't deliver fast breakthroughs. Today Human Genome's stock price is down below \$3, and its vast patent portfolio looks like overkill, considering that a human has only about 20,000 genes altogether.

Scientists have made plenty of progress over the past decade in generating genomic data. The Human Genome Project, after employing hundreds of scientists for many years at a total cost of \$3 billion, produced in 2000 an error-riddled collage of several people's DNA. Data, however, is not the same thing as insight. Rather than finding cures for cancer, diabetes, and other intractable diseases, scientists have mainly learned just how staggeringly complicated genomes are.

One of the most promising techniques for making sense of the data is known as genome-wide association. It entails searching among thousands of people for genetic markers—spots along the human genome where individual letters of DNA vary from person to person. Scientists then look for those markers that tend to show up in people who have a certain disease, but are missing from those who don't. Next the scientists find those disease markers in the complete human genome sequence and begin to search for genes nearby that might play a role. These studies, being large, are slow to yield results, but several have been completed in recent months.

**DIRECTIONS** for questions 37 to 40: Answer the questions on the basis of the information given below.

In a family of nine members, spanning three generations, there are three married couples in the first two generations. Also in the family, there are two housewives, a doctor, an engineer, a software professional, a pharmacist, a lawyer, an architect and a student. The following information is also known about them:

Cancer researchers are also using genome-sequencing technology to pinpoint key mutations known to arise in certain kinds of tumours, and they're hoping to use that knowledge to create new drugs. In many cases of myeloid leukemia, for example, all the cancer cells depend for their survival on the same protein produced by the same mutant gene. A drug called Gleevec targets that protein, and, as a result, it has proved to be spectacularly effective against myeloid leukemia. The National Institutes of Health has launched a Cancer Genome Atlas, and scientists in other countries have started similar projects as well.

So far, though, they have found no new Gleevecs. Instead, they've revealed a new frontier in the complexity of genomes. As cancer cells evolve, they tend to acquire mutations that make them more likely to mutate in the future, which means they end up with a lot of mutations that could serve as disease markers. Last November, Washington University biologists sequenced the complete genome of a myeloid leukemia cell, compared it with the genome of a skin cell from the same patient, and found 63,277 mutations in the cancer cell that didn't appear in the skin cell. Scientists are now combing for ones that could serve as targets for drugs.

So far, though, genome-wide association studies have not provided quick fixes for cancer or other diseases. In fact, the markers found in such studies are raising more questions than they are answering. One problem is that the studies typically point to a handful of new genetic markers, each of which accounts for only a tiny amount of the risk of getting a particular disease, leaving most of the risk unknown. It's possible that the genome-wide association studies have missed some genes with powerful effects, and that scientists haven't identified these genes yet because only a few people carry the variants that can dramatically boost disease risk. A second possibility is that hundreds—perhaps even thousands—of variants of genes may influence the risk of disease. These variants may all be very common, but any single one may raise your risk of a disease by a tiny amount. Inheriting only a particular combination of many variants would increase your risk of developing a disease dramatically.

Neither possibility bodes well for genomic medicine. If diseases are controlled by powerful but rare variants, scientists will first have to track them all down. If diseases are caused by common variants in unlucky combinations, scientists will have to test each person for variants on hundreds or even thousands of genes. Doctors who want to treat these diseases won't simply be able to fix a single defective gene in every person with a particular disease; they'll have to sort through a jumble of variations to figure out why some people get sick and some don't.

As complicated as our individual human genomes are, a person's health depends on much more. A human body contains about a trillion cells, but it houses somewhere between 10 trillion and 100 trillion microbes, which have a powerful influence on our well-being. Some help us digest nutrients, others help block dangerous pathogens. In 2007, microbiologists launched the Human Microbiome Project to sequence the genes of these beasts. While each microbe species may have just a few hundred or a thousand genes, collectively they outnumber human genes by 100 to 1. Scientists are compiling a growing catalog of foreign genes, but the data so far do not explain much. Each person's microbial jungle may be a unique mix of species, making it hard to draw any general lesson.

41. The human genome was medicine's holy grail. The writer feels that
  - (1) genomic science flattered to deceive.
  - (2) genomic science has a long way to go to deliver results.
  - (3) biotech companies jumped the gun.
  - (4) genomic science would change the art of healing forever.
  
42. According to the passage, genetic markers
  - (1) are associated with hereditary diseases.
  - (2) are identified and isolated by scientists for genome-wide association.
  - (3) that are associated with diseases are scrutinized for determinant genes.
  - (4) that are linked to diseases cannot be differentiated from benign ones.
  
43. According to the passage, in what way do mutations pose a challenge to scientists involved in cancer research?
  - (1) Mutant genes provide the nutrition that cancer cells need to grow.
  - (2) Gleevec can only target the protein of the mutant gene associated with myeloid leukemia.
  - (3) Cancer cells mutate beyond control and all the mutations are disease markers.
  - (4) There are too many mutations in the cancer cell to identify the ones that could be targeted by drugs.

**DIRECTIONS** for questions 44 and 45: The following questions have a set of sentences with blanks. Each question is followed by four options. Among the four options, only one has the correct set of words which can fit into all the blanks in the correct sequence. Mark the number of that option as your answer.

44. (A) I suggest you keep the matter under \_\_\_\_\_, until it comes to fruition. You must remember that \_\_\_\_\_ is the better part of the valour under certain circumstances.  
 (B) His exiguous income was barely sufficient to make \_\_\_\_\_ meet, as he had many \_\_\_\_\_ to feed.  
 (C) He is rather outspoken, but his \_\_\_\_\_ is in the right place.  
 (1) wraps, secrecy, ends, members, head  
 (2) cover, discretion, ends, children, head  
 (3) wraps, discretion, ends, mouths, heart  
 (4) shade, stealthiness, things, mouths, mind
  
45. (A) When the conflict between the two groups of students came to a \_\_\_\_\_, the principal had to intervene and settle the dispute.  
 (B) People find his company rather boring because he always talks \_\_\_\_\_.  
 (C) His snobbish behaviour set his colleagues' \_\_\_\_\_ on edge.  
 (D) Seema is usually in high \_\_\_\_\_ but today she seems to be off \_\_\_\_\_.  
 (1) nought, business, head, spirits, mood

- (2) crescendo, rubbish, heart, spirits, bounds
- (3) head, nonsense, feet, spirits, key
- (4) head, shop, teeth, spirits, colour

**DIRECTIONS** for questions 46 to 48: Select the correct alternative.

**46.** The Chief Minister, who had the assembly dissolved four months before the next fiscal with an eye on early elections, is now desperate for an Assembly to be able to pass the state budget. However, the Chief Election Commissioner has made it clear that there could be no elections until April next and that the passing of budget was the state government's problem.

What inference can be drawn from the Chief Election Commissioner's response?

- (1) The Election Commission has no right to meddle with the government policies.
- (2) The Chief Minister should have been discreet enough to pass the state budget before dissolving the assembly.
- (3) The Election Commission can think of holding elections at its discretion but cannot mull over the state government's problems.
- (4) Temporal constraints are to be necessarily taken into account for the conduct of the elections.

**47.** Child: Why don't we put some photographs into the empty folders of this album?

Father: Sure. I am bound for my office now, so, let's do it in the leisure of the evening.

Child: No worries. Mom and I wouldn't mind doing it. Which of the following, if true, could best be inferred about the child?

- (1) He is one of those children who are more attached to one of the two parents than to both of them.

**DIRECTIONS** for questions 49 to 52: Read the following passage and answer the questions that follow it.

Like big hairdos and dubious pop stars, the term "artificial intelligence" (AI) was big in the 1990s, vanished in the 1990s and now seems to be attempting a comeback. The term re-entered public consciousness most dramatically with the release in 2001 of *A.I.*, a movie about a robot boy. But the term is also being rehabilitated within the computer industry. Researchers, executives and marketing people are using the expression without irony or inverted commas.

And it is not always hype. The term is being applied, with some justification, to products that depend on technology that was originally cooked up by AI researchers. Admittedly, the comeback has a long way to go, and some firms still prefer to avoid the phrase. But the fact that others are starting to use it again suggests that AI is no longer simply regarded as an overambitious and underachieving field of research.

That field was launched, and the term "artificial intelligence" coined, at a conference in 1956 by a group of researchers that included Marvin Minsky, John McCarthy, Herbert Simon and Alan Newell, all of whom went on to become leading lights in the subject. The term provided a sexy-sounding but informative semantic umbrella for a research programme that encompassed such previously disparate fields as operations research, cybernetics, logic and computer science. The common strand was an attempt to capture or mimic human abilities using machines. That said, different groups of researchers attacked different problems, from speech recognition to chess playing, in different ways; AI unified the field in name only. But it was a term that captured the public's imagination.

Most researchers agree that the high water mark for AI occurred around 1985. A public reared on science fiction movies and excited by the growing power of home computers had high expectations. For years, AI researchers had implied that a breakthrough was just around the corner. ("Within a generation, the problem of creating 'artificial intelligence' will be substantially solved," Dr Minsky said in 1967.) Prototypes of medical-diagnosis programs, speech recognition software and expert systems appeared to be making progress. The 1985 conference of the American Association of Artificial Intelligence (AAAI) was, recalls Eric Horvitz, now a researcher at Microsoft, attended by thousands of people, including many interested members of the public and entrepreneurs looking for the next big thing.

- (2) The inclination to arrange the photographs has no relation to the child's feelings for either parent.
- (3) The child's interest in arranging the photographs has no bearing on pragmatic routine.
- (4) He is of the age when children are more focused on those tasks that they desire to complete immediately.

**48.** According to a study published in the *New England Journal of Medicine*, the use of the drug, Lorcaserin, could cause weight reduction which, while not spectacular, would happen with side effects less harmful than those that other drugs cause. The drug acts on a specific subset of receptors which play a role in satiety.

Which of the following, if true, would most strengthen the study's claim?

- (1) Lorcaserin, mostly, helps the obese lose about 2 -- 3% of their body weight with few side effects.
- (2) Several weight-loss drugs have been abandoned in the last stage of their development, though they showed no side effects.
- (3) Most people who got used to Lorcaserin, have not only shed weight but also developed the aversion to a second helping.
- (4) A requirement of food intake along with the drug seems unnecessary as there are few reports of fever and nausea upon exclusive consumption of Lorcaserin.

It proved to be a false dawn. Thinking computers and household robots failed to materialize, and a backlash ensued. "There was undue optimism," says David Leake, a researcher at Indiana University who is also the editor of AI Magazine, which is published by the AAAI. "When people realized these were hard problems, there was retrenchment. It was good for the field, because people started looking for approaches that involved less hubris." By the late 1980s, the term AI was being eschewed by many researchers, who preferred instead to align themselves with specific sub disciplines such as neural networks, agent technology, case based reasoning, and so on. The expectations of the early 1980s, says Dr Horvitz, "created a sense that the term itself was overblown. It's a phrase that captures a long term dream, but it implicitly promises a lot. For a variety of reasons, people pulled back from using it."

Ironically, in some ways, AI was a victim of its own success. Whenever an apparently mundane problem was solved, such as building a system that could land an aircraft unattended, or read handwritten postcodes to speed mail sorting, the problem was deemed not to have been AI in the first place. "If it works, it can't be AI" as Dr. Leake characterizes it. The effect of repeatedly moving the goalposts in this way was that AI came to refer to blue sky research that was still years away from commercialisation. Researchers joked that AI stood for "almost implemented". Meanwhile, the technologies that worked well enough to make it onto the market, such as speech recognition, language translation and decision support software, were no longer regarded as AI. Yet all three once fell well within the umbrella of AI research.

49. According to the passage, AI was a victim of its own success because
  - (1) it had earned a reputation of being a non-starter.
  - (2) its launch was ill-timed.
  - (3) its viability was always in question.
  - (4) it gave rise to high expectations.
50. The passage suggests that AI
  - (A) was a case of too little, too late.
  - (B) is all hype and no substance.
  - (C) experienced a roller coaster ride from the beginning.
  - (D) experienced a see-saw in its fortunes.

(1) A and B	(2) A, C and D
(3) Only D	(4) Only A
51. Retrenchment was good for the AI field because
  - (1) researchers raised the bar consistently.
  - (2) people changed their opinion and pulled back from it.
  - (3) researchers began to focus on specific areas.
  - (4) industry saved on costs.
52. That researchers, executives and marketing people are using the term AI without irony or inverted commas implies that
  - (1) they no longer doubt its credibility.
  - (2) the field has shed its image of being a non-achiever.
  - (3) they will stop belittling it.
  - (4) they are keen on promoting it.

**DIRECTIONS** for question 53: Four summaries follow the text provided below. Choose the option that best captures the essence of the text.

53. When you say 'animated film' the moving pictures that come to mind are evocatively hand-drawn Disney movies aimed at kids. In reality, many forms

of animation have crossover adult appeal. Some animation films are made chiefly for adults, others are designed to snag a child still lurking at the core of our grownup hearts. Unconvinced? Well, just go see Toy Story 3 and it will be a memorable reunion complete with giggles and tears-with old friends Buzz and Woody. Animated films such as the remarkable Toy Story Trilogy or Up want their kiddie audiences but are not one dimensional; they are cleverly constructed to evoke the wonderment of childhood as well as layer in themes/pop culture references that appeal to the adult. Animation of course is not every adult's celluloid brew of choice; it is a style of filmmaking and tastes differ. Just as you could favour Butterscotch over Vanilla, you might prefer real actors to animated characters.

- (1) The word animation conjures up children's films. But many such films appeal to adults also though they draw children to view them because the themes are varied.
- (2) Animated films, we think, are only for children. However, animated films appeal even to adults because the films cleverly include such themes.
- (3) Animated films, it is thought are for children. However, such films can cater to adults and also to the child in adults. The themes of animated films are multi-dimensional but to view or not to view is left to the choice of the adult.
- (4) Many animated films appeal to adults though they are made for children because many adults are still children. Of course to see or not to see animated films is left to the choices adults make.

**DIRECTIONS** for questions 54 to 57: Read the following passage and answer the questions that follow it.

**W**omen generally have had more practice at some interpersonal skills than men, at least in cultures like the United States, where girls are raised to be more attuned to feelings and their nuances than are boys. So does this mean women are more empathetic than men?

Often-but not inevitably. The popular assumption that women are naturally more attuned than men to the feelings of others has a scientific basis-but there are two notable exceptions of particular significance for the workplace. For one, there is no sex difference in cases where people are trying to conceal their true feelings, nor is there one when the challenge is to sense the unstated thoughts of someone in an ongoing encounter.

A caveat about sex differences in general: Whenever large groups like men and women are compared on *any* psychological dimension, there are far more similarities between the groups than differences; the bell curves for the two groups have immense overlap, and an edge where they differ. This means, for example, that while on average women may be better than men at some emotional skills, some men will still be better than most women, despite there being a statistically significant difference between the groups.

Now, the data on empathy. The results from dozens and dozens of studies on the question are both mixed and clarifying. For one, whether women do better than men depends on what is meant by "empathy". There is one sense in which women—at least in Western cultures—are, on average, more empathetic: having the same feeling another person does—that is, when one person feels distress or delight, so does the other. The data shows women do tend to experience this spontaneous matching of feeling with others more than men do.

Women are also better than men at *detecting* another person's fleeting feelings, as was shown in a test called the Profile of Non-verbal Sensitivity which was developed by Harvard professor Robert Rosenthal, with Judith Hall, now at Northeastern University. The test consists of dozens of short video clips in which someone is having an emotional reaction (having been told, for example, they just won a lottery, or that a beloved pet has just died). The clips are filtered, so that the words cannot be heard distinctly; though the facial expression and the tone of voice are clear. Through hundreds of studies, Rosenthal and Hall found that 80 percent of the time women performed better than men at the task of guessing what emotion the person was actually feeling.

However, the gender gap in reading emotions closed when the clips included emotional cues that are less easy to control than facial expression. People are better at controlling their overall facial expression than their tone of voice, body language, or fleeting "microemotions" that hit across the face for just a split second. The more emotional leakage, the better men become at reading emotion in others. Being able to pick up such emotional leakage is particularly important in situations where people have reason to conceal their true feelings—a fact of life in the business arena. And so sex differences in empathy tend to disappear in many everyday business situations, like sales or negotiation, where most people simply cannot control all the body's channels for expressing emotion.

And when it comes to another dimension of empathy—being able to sense someone's specific thoughts—there appears to be no sex difference at all. This more complicated task, called *empathic accuracy*, integrates cognitive and affective skills. The experimental methods used to assess empathic accuracy go beyond showing a snippet of an emotional response and asking people to guess the emotion; rather, subjects watch an entire videotape of a conversation and evaluate a person's hidden thoughts—as well as feelings—throughout. Those guesses are then compared with the target person's own narrative. On this task women generally did no better than men; in a series of seven different experiments there was no evidence of a "female intuition" advantage. The significant exception was in a special subset of tests in which women were subtly prompted to prove themselves empathic by the researcher's suggestion that empathy is a hallmark of feminine identity. With that prompt, the female advantage in empathy emerged once again. In other words, the motivation to seem empathic made women more so (presumably because they made more effort).

Indeed, a major review of data on male-female sex differences argues that men have as much latent ability for empathy, but less motivation to be empathic, than do women. To the extent men tend to see themselves in terms of something like machismo, the argument goes, they have less motivation to seem sensitive, because that could be seen as a sign of "weakness". As William Ickes, one of the main researchers on empathy, puts it, "If men appear at times to be socially insensitive, it may have more to do with the image they wish to convey than with the empathetic ability they possess."



**DIRECTIONS** for questions 58 to 60: Identify the incorrect sentence or sentences.

58. (A) Many citizens did not share the view of the so-called experts.  
(B) The European Commission had envisaged an element of opposition, stating which the plan may call forth negative reactions.  
(C) This was a serious underestimate to the furore that ensued.  
(D) The opposition was so stubborn and vociferous that the commission was forced to revoke the plan.  
(1) A and B (2) Only B (3) A and D (4) B and C

