Gambitor Question Paper-22-23
APOLLOX

11th Q.1-2 :
Everybody in the forest lives peacefully under the rule of Tiger and his Wise minister Pegasus. One day Kareena Kapoor meets the Tiger and the Pegasus in a Forest. She knows that the Tiger tells the truth on all days but Mondays, Tuesdays, and Wednesdays. The Pegasus, on the other hand, tells the truth on all days except Thursdays, Fridays, and Saturdays
Now they make the following statements to Kareena: Tiger: Yesterday was one of my lying days.
Pegasus: Yesterday was one of my lying days too.

1. What day is it?

a. Thursday

b. Saturday

c. Monday

d. Wednesday

Answer. a

2.

In a jungle, there were many animals. As we know each animal needed something to survive. So,Some lions decided to kill, among them, 99999919 deers. Every lion killed an equal number of deers. Each lion killed more deers than there were lions. How many deers do you think that each lion killed ?

a. 1009

b. 991

c. 2000

d. 1000

Answer. a

11th Q.1-4 :
Q. Fuel contamination levels at each of 20 petrol pumps P1, P2,....., P20 were recorded as either high, medium, or low.
1.) Contamination levels at three pumps among P1-P5 were recorded as high
2.) P6 was the only pump among P1-P10 where the contamination level was recorded as low
3.) P7 and PS were the only two consecutively numbered pumps where the same levels of contamination were recorded
4.) High contamination levels were not recorded at any of the pumps P16- P20
5.) The number of pumps where high contamination levels were recorded was twice the number of pumps where low contamination levels were recorded.

3. Which of the following MUST be true?

a. The contamination level at P12 was recorded as high

b. The contamination level at P20 was recorded as medium

c. The contamination level at P10 was recorded as high

d. The contamination level at P13 was recorded as low.

Answer. c

4. What best can be said about the number of pumps at which the contamination levels were recorded as medium?

a. Exactly 8

b. Almost 9

c. At least 8

d. More than 4

Answer. a

5. If the contamination level at P11 was recorded as low, then which of the following MUST be true?

a. The contamination level at P1B was recorded as low

b. The contamination level at P15 was recorded as medium

c. The contamination level at P14 was recorded a medium

d. The contamination level at P12 was recorded as high

Answer. c

6. If contamination level at P15 was recorded as medium, then which of the following MUST be FALSE?

a. Contamination levels at P11 and P16 were recorded as the same.

b. Contamination levels at P10 and P14 were recorded as the same.

c. Contamination level at P14 was recorded to be higher than that at P15.

d. Contamination levels at P13 and P17 were recorded as the same.

Answer. a

11th Q.5-9 :
Instructions : A journal plans to publish 18 research papers, written by eight authors (A, B, C, D, E, F, G, and H) in four issues of the journal scheduled in January, April, July and October. Each of the research papers was written by exactly one of the eight authors. Five papers were scheduled in each of the first two issues, while four were scheduled in each of the last two issues. Every author wrote at least one paper and at most three papers. The total number of papers written by A, D, G and H was double the total number of papers written by the other four authors. Four of the authors were from India and two each were from Japan and China. Each author belonged to exactly one of the three areas, Manufacturing, Automation, and Logistics. Four of the authors were from the Logistics area and two were from the Automation area. As per the journal policy, none of the authors could have more than one paper in any issue of the journal.

The following facts are also known.

1. F, an Indian author from the Logistics area, wrote only one paper. It was scheduled in the October issue. 2. A was from the Automation area and did not have a paper scheduled in the October issue.
3. None of the Indian authors were from the Manufacturing area and none of the Japanese or Chinese authors were from the Automation area.
4. A and H were from different countries, but had their papers scheduled on exactly the same issues.
5. C and E, both Chinese authors from different areas, had the same number of papers scheduled. Further, E had papers scheduled in consecutive issues of the journal but C did not.
6. B. from the Logistics area, had a paper scheduled in the April issue of the journal.
7. B and G belonged to the same country. None of their papers were scheduled in the same issue of the journal.
8. D, a Japanese author from the Manufacturing area, did not have a paper scheduled in the July issue.
9. C and H belonged to different areas.

7. What is the correct sequence of the number of papers written by B, C, E and G, respectively?

a. 1, 2, 2, 3

b. 1, 3, 3, 1

c. 3, 1, 1, 3

d. 1, 2, 2, 1

Answer. a

8. How many papers were written by Indian authors?

Answer. 8

Which of the following statement(s) MUST be true?
Statement A: Every issue had at least one paper by author(s) from each country.
9. Statement B: Every issue had at most two papers by author(s) from each area.

a. Both the statements

b. Only Statement B

c. Only Statement A

d. Neither of the statements

Answer. c

10. Which of the following statements is FALSE?

a. Every issue had at least one paper by author(s) from the Automation area.

b. Every issue had exactly one paper by a Chinese author.

c. Every issue had exactly two papers by authors from the Logistics area.

d. Every issue had exactly two papers by Indian authors.

Answer. c

11. Which of the following statements is FALSE?

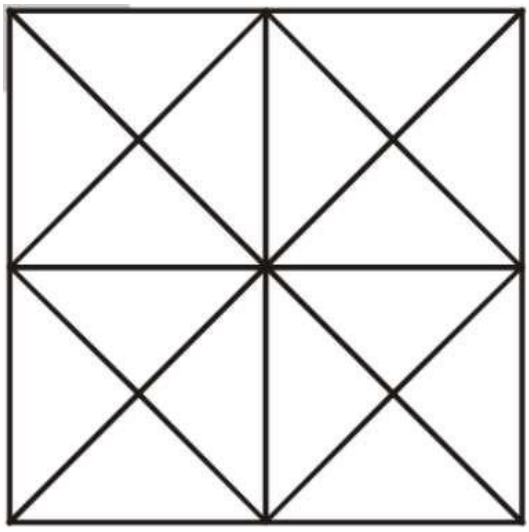
a. There were exactly two papers by authors from the Manufacturing area in the January issue.

b. There was exactly one paper by an author from the Manufacturing area in the April issue.

c. There was exactly one paper by an author from the Logistics area in the October issue.

d. There were exactly two papers by authors from the Manufacturing area in the July issue.

Answer. d

12. Count the number of triangles and squares in the given figure 

a. 42 triangles, 8 squares

b. 46 triangles, 8 squares

c. 44 triangles, 10 squares

d. 44 triangles, 12 squares

Answer. c

13. Amir was born on Feb 29th of 2012 which was a Wednesday. If he lives to be 101 years old, how many birthdays would he celebrate on a Wednesday?

a. 3

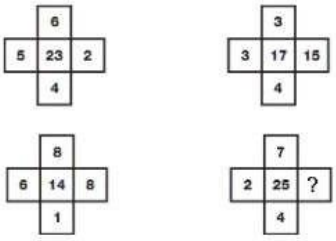
b. 4

c. 5

d. 1

Answer. b

14. Which number replaces the question mark?



Options:

a. 3

b. 1

c. 6

d. 14

Answer. b

15.

There is an Inter-IIT Meet going on. For that,3 teams have to be selected from a group of 84 students –cricket team, hockey team and football team. All the students are part of at least one of the three teams. The following information is known: The football team has the maximum number of students. There are 42 students in the aerobics team. The number of students who were part of only the cricket team was 4 less than the number of students who were part of only the hockey team. 30 members who belonged to the cricket team were also part of at least one of the other two teams .The number of students who were part of only the hockey team was double the number of students who were part of the three teams. In the football team, the number of students who were also part of the hockey team was 2 less than the number of students who were part of only the football team.
What can be the minimum number of students who are part of both the cricket team and the football teams, but not the hockey team?

a. 10

b. 11

c. 12

d. 9

Answer. b

16.

How many pairs of integers (a,b) exist, where $1 \leq a,b \leq 20$, for which $\text{lcm}(a,b)/\text{gcd}(a,b) \leq 3$.
In this problem, gcd(a,b) denotes the greatest common divisor of the numbers a and b, and lcm(a,b) denotes the smallest common multiple of the numbers a and b.

a. 50

b. 51

c. 52

d. 53

Answer. c

17.

There is a large football(a unit sphere). 4 points are chosen on it. What is the probability that the origin lies inside the tetrahedron determined by the four points?

a. 1/4

b. 1/6

c. 1/8

d. 1/10

Answer. c

18.

Yoda is an intelligent being in StarWars. He does everything on the basis of logic. Yoda took 543 apples on Day 1,216 apples on Day 2,225 Apples on Day 3,141 apples on Day 4,432 apples on Day6.How many apples would he take on Day 5?

a. 79

b. 243

c. 66

d. 157

Answer. c

19.

If A + B means A is the mother of B; A - B means A is the brother B; A % B means A is the father of B and A x B means A is the sister of B, which of the following shows that P is the maternal uncle of Q?

a. Q - N + M x P

b. P + S x N - Q

c. P - M + N x Q

d. Q - S % P

Answer. c

20. Find odd one out

a. (3,5,6)

b. (2,3,4)

c. (7,8,10)

d. (3,4,6)

Answer. c

21.

In James Thomason Building,All the deans stay.In the building,There are 100 doors consecutively, all doors are initially closed. A person walks through all doors multiple times and toggle (if open then close, if close then open) them in the following way: In the first walk, the person toggles every door
In the second walk, the person toggles every second door, i.e., 2nd, 4th, 6th, 8th, …
In the third walk, the person toggles every third door, i.e. 3rd, 6th, 9th, …
Likewise, In the 100th walk, the person toggles the 100th door.
What is the ratio of the number of doors opened to the number of doors closed.

a. 1/10

b. 1/9

c. 1/8

d. 1/7

Answer. b

22. Let's define S(x) to be the sum of digits of number x written in the decimal system. For example, S(5)=5, S(10)=1, S(322)=7.

We will call an integer x intersecting if $S(x + 1) < S(x)$. Your task is to calculate the number of integers x such that $1 \leq x \leq 880055535$ and x is interesting.

a. 880055534

b. 88005553

c. 88005554

d. 88005535

Answer. b

23.

Suppose that all positive integers c which can be expressed as c^2= b^2-a^2, where b and a are positive integers such that b > a, are arranged in an increasing sequence.
What will be the 18th number in this sequence?

Answer. 27

24.

Let $a_x = \sum_{y=1}^{x} \quad (y^2 + x^2)/x^3$

$b_x = \sum_{y=0}^{x-1} \quad (y^2 + x^2)/x^3$

For x=1,2,3,..... then

a. $a_x < \frac{4}{3}$

b. $a_x > 1$

c. $b_x > 1.5$

d. $b_x < 1.40$

Answer. b

25. Suppose p , q are positive real numbers such that a√b+b√a= 12 , a√a+b√b= 89. Find (a+b)x5

Answer. 101

26. Let a , b be prime numbers such that $v^{3ab} - v$ is a multiple of 3ab for all positive integers v.
Find the least possible value of a + b.

Answer. 28

27.

Let T1 be a circle with center O and let AB be a diameter of T1. Let P be a point on the segment OB different from O. Suppose another circle T2 with center P lies in the interior of T1. Tangents are drawn from A and B to the circle T2 intersecting T1 again at V and S respectively such that V and S are on the opposite sides of AB. Given that VB = 5, AS = 15 and OP = 10, find the radius of T1.

Answer. 20

28. Let E denote the set of all natural numbers n such that 3 < n < 100 and the set {1, 2, 3, . . . ,n} can be partitioned into 3 subsets with equal sums.
Find the number of elements of E?

Answer. 64

23.

Suppose Tony Stark's house is broken because of the attack of Aldrich Killian. So he calls two teams of workers to build his house . Team A does the construction in 12 days to completely build the home and whereas Team B can finish the construction in 36 days alone. Now Team A starts work and after 4 days Team B joins the work. After 2 more days Team A quits the work because they fear Aldrich Killian. So now how many more days do Team B need to work to complete the construction of Tony Stark's home ?

Answer. 16

30.

Let there be a triangle RIP in which there is a point M on the segment IP. Let the Incentres of the triangles RIM and RPM be C and A . Let RC and RA meet IP in E and N. If $\angle$ ICE = 60^{o}, what is the measure of $\angle$ PAN in degrees?

Answer. 30

31. Let $f(x) = \sin(x/3) + \cos(3x/10)$ for all real x. Find the least natural number t such that $f(t + x) = f(x)$ for all real x.

Answer. 60