Mock Test 1

Quantitative Aptitude – Set-1

Question 1:
There are exactly 5984 balls, stocked in a pile, such that the top layer of the pile has one ball, the layer below it has three balls, the layer below which has six balls, the layer below which has ten balls and so on. Find the approximate number of layers in the pile.

Question 2:
How many natural numbers divide exactly two among 84, 120 and 210?

- (a) 8
- (b) 12
- (c) 10
- (d) 8

Question 3:
The lines 4x + 5y = 134 and y = mx + 16 intersect at points whose coordinates are integers. Find the number of positive integer values that m can assume.

- (a) 1
- (b) 2
- (c) 3
- (d) 4

Question 4:
A window is in the shape of a square surmounted by a semicircle, where the base diameter of the semicircle coincides with the upper side of the square. If the perimeter of the window is 16 ft, find the approximate area (in sq. ft) of the window.

- (a) 17.1
- (b) 8.3
- (c) 29.5
- (d) 11.5

Question 5:
Two circles, C1 and C2, each of radius 3 cm, with centers at X and Y respectively, intersect each other such that the line XY joining the centers intersects the circles C1 and C2 at P and Q respectively and PQ = 2 cm. If the whole assembly is enclosed in a rectangle of minimum possible area, the perimeter of the rectangle is:

- (a) 28
- (b) 32
- (c) 40
- (d) 60

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Question 6:
If 4|3x+1|=162x−44^{|3x+1|} = 16^{2x-4}, find the sum of all the possible values of xx.

- (a) 9
- (b) 10
- (c) 11
- (d) 12

Question 7:
The function f(x)=|x–1|+|2.8–x|+|x–3|f(x) = |x – 1| + |2.8 – x| + |x – 3|, where x is a real number, can attain a minimum value of:

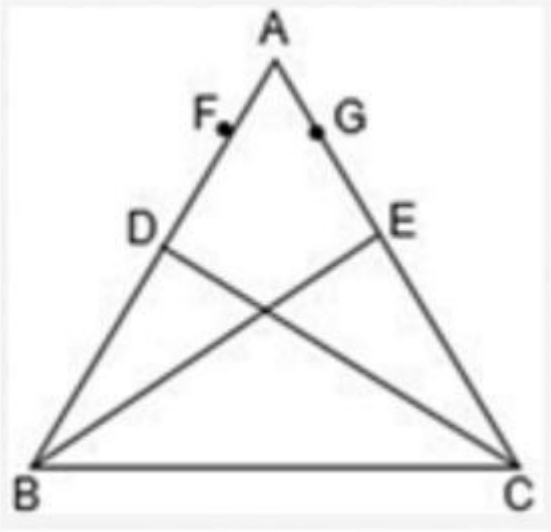
- (a) 1
- (b) 2
- (c) 3
- (d) 2.8

Question 8:
Prasad writes an exam in which there are 70 questions. If three marks are given for each correct answer and one mark is deducted for every incorrect answer, and Prasad attempted only half the total number of questions and scored a net of 45 marks, how many questions did Prasad answer correctly?

Question 9:
If the average weight of a group of 15 items is 30 kg and none of the items weighs more than 32 kg, find the least possible weight (in kg) of any item in the group.

- (a) 2
- (b) 4
- (c) 3
- (d) 0

Question 10:



In the figure below, CD and BE are the medians to the sides AB and AC respectively, while F and G are points on AB and

AC such that FE is parallel to DC and DG is parallel to BE. Find the perimeter (in cm) of the triangle AFG, if AB = 16 cm, AC = 20 cm and FG = 6 cm.

Question 11:
A, B, C and D are four positive numbers which satisfy the equation A+2B+3C+4D=36A + 2B + 3C + 4D = 36. Find the maximum possible value of AB2CD2AB^2CD^2.

- (a) 3888
- (b) 3744
- (c) 4176
- (d) 3818

Question 12:
If $f(x) = ax^2 + bx + c$ and $f(x + 5) = 2x^2 + 15x + 29$, find the value of $a + b + c$.

Question 13:
Find the remainder when 29!29! is divided by 31.

Question 14:
Mohan is a carpenter who specializes in making chairs. The total amount that he charges for any assignment he undertakes comprises two components, his wages for the assignment and the cost of raw materials involved. The first component is fixed and equals ₹560 per assignment and the second component is a variable component which equals 2n22n^2, where n is the number of chairs he makes in that assignment. If for a certain assignment, the average amount charged per chair by Mohan is not more than ₹68, then the minimum and maximum possible number of chairs in the assignment are (respectively):

- (a) 13 and 19
- (b) 13 and 20
- (c) 14 and 19
- (d) 14 and 20

Question 15:
In a 6 km long race, A beats B by 20 seconds, B beats D by 70 seconds and C beats D by 40 seconds. If the speed of A is 54 km/hr, by what distance does B beat C?

- (a) 360 m
- (b) 489 m
- (c) 380 m
- (d) 400 m

Question 16:
On a certain day, Ajay works at $\frac{11}{7}^{th}$ of his usual rate of doing work and completes a work 28 minutes earlier than the usual time required. Had Ajay worked at $\frac{7}{11}^{th}$ of his usual rate of doing work, then the time taken by him to complete the work would have been how much more than the usual time required?

- (a) 16
- (b) 28
- (c) 32
- (d) 44

Question 17:
Find the value of tt, if t%t \% of tt is 25 and tt is a positive real number.

- (a) 50
- (b) 25
- (c) 75
- (d) 100

Question 18:
In how many ways can six balls of different colors be put into three identical baskets?

Question 19:
A grandfather bought a certain number of chocolates as a Diwali gift for his three grandsons. He called them and asked them to share the chocolates in the ratio of their ages, which happened to be 3 : 4 : 5, without mentioning the total number of chocolates that he bought. As the chocolates were kept in their grandfather's room, each child arrived there at a different time of the day and took his respective share, thinking that he was the first to arrive. What fraction of the chocolates remained unclaimed at the end of the day?

Question 20:

If $x + x^{-1} = 3$, find the value of $x^4 + x^3 + x^2 + x + x^0 + x^{-1} + x^{-2} + x^{-3} + x^{-4}$.

Question 21:
If the external angles in degrees, of a convex n-sided polygon, are all integers, which are in arithmetic progression, how many values are possible for nn?

- (a) 16
- (b) 14
- (c) 10
- (d) 8

Question 22:
How many natural numbers less than one lakh can be formed using the digits 0, 6 and 9?

- (a) 1210
- (b) 2430
- (c) 243
- (d) 242

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Answer Key

1. **(Approximate number of layers): 34**
2. **(B) 12**
3. **(C) 3**
4. **(C) 29.5**
5. **(B) 32**
6. **(A) 9**
7. **(C) 3**
8. **20 questions correct**
9. **(A) 2**
10. **AFG = 6 + 8 + 6 = 20 cm**
11. **(A) 3888**
12. ***(Missing)***
13. **1 (Using Wilson's Theorem: $(p - 1)! \equiv -1 \bmod p$ for prime p)**
14. **(B) 13 and 20**
15. **(C) 380 m**
16. ***(Question Missing)*** **– Can't confirm answer**
17. **(A) 50**
18. **90 ways (Using Stirling Numbers of the Second Kind and symmetry)**
19. **1/3 of chocolates remain unclaimed**
20. ***(Question Missing)*** **– No answer possible**
21. **(B) 14**
22. **(B) 2430**