Mock Test 6

Quantitative Aptitude Set-6

Question 1/22

Let $\bar{x}$ and $[x]$ represent the fractional component of x and the greatest integer less than or equal to x, respectively, such that $x = [x] + \bar{x}$. If two functions $f: R \to R$ and $g: R \to R$ are defined by $f(x) = \bar{x}$ and $g(x) = \cos([x]\pi)$, the range of $gof(x)$ is

What is the range of the function $f(x) = x^2 / (1 + x^2)$?
(a) {0}
(b) {1}
(c) {–1, 1}
(d) [–1, 1]

Answer the question on the basis of the information given below:
There are 100 players, numbered 1 to 100, and 100 baskets, numbered 1 to 100. The first player puts one ball each in every basket starting from the first basket (i.e., in baskets 1, 2, 3, …). The second player puts two balls each in every second basket starting from basket 2 (i.e., baskets 2, 4, 6, …). The third player puts three balls each in every third basket starting from basket 3 (i.e., baskets 3, 6, 9, …). All the remaining players also put the balls in this manner: player n puts n balls each in every nth basket starting from basket n.

Question 2/22
Type in your answer in the input box provided below the question. Find the number of the basket which will finally have the maximum number of balls?

Question 3/22
Type in your answer in the input box provided below the question. How many baskets will finally have exactly twice the number of balls as the number on the basket itself?

Question 4/22
An entrance exam has 200 MCQs. Every correct answer gets 1 mark, every wrong answer gets −¼ mark, and no marks are given or deducted for unattempted questions.
If a group of students attempted different numbers of questions but all scored the same net score of 40 marks, what is the **maximum number of such students** possible?

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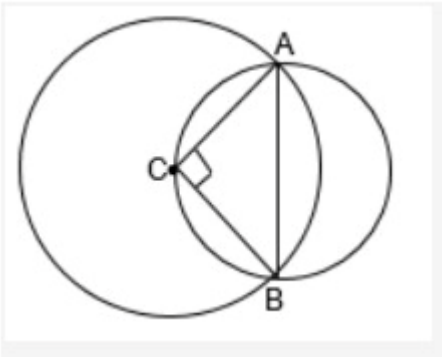
Question 5/22



In the figure, C is the centre of the bigger circle, ∠ACB = 90°, and the length of the common chord AB is 14 cm. What is the area (in sq. cm) common to both the circles?

(a) 88
(b) 99
(c) 100
(d) 105

Question 6/22

Select the correct alternative from the given choices. Three runners, A, B and C, are running in the clockwise direction around a circular track. The track is marked with numbers from 1 to 12, uniformly spaced along the track, in the clockwise direction, like the dial of a clock. A overtakes B once at 5 and then the next time again at 9. A also overtakes C once at 2 and then the next time again at 4. If the speed of neither B nor C is greater than half that of A, what is the ratio of B's speed to C's speed?

(a) 7 : 4
(b) 2 : 1
(c) 3 : 2
(d) 5 : 4

Question 7/22

How many pairs of positive integers (a, b) satisfy the equation $a^4 - b^4 = 9876$?

Question 8/22

If it is known that $b_m = a_1$, $\frac{a_m}{b_m} = \frac{6}{5}$, $c_n = b_1$ and $\frac{a_n}{b_n} = \frac{8}{7}$, find $\frac{a_1}{c_1}$.

Select the correct alternative from the given choices. There are three arithmetic progressions – A, B and C – with the same common difference, whose terms are as follows: A : a1, a2, a3,…. B : b1, b2, b3,…. C : c1, c2, c3,….

(a) 5 : 1
(b) 6 : 1
(c) 7 : 2
(d) Cannot be determined

Question 9/22

f(x) is a linear function and it satisfies:

f(x) − f(−x) = 4x and f(x) + f(−x) = 4.
Find the value of f(31).

Question 10/22
Amit borrowed ₹21,000 from Vinay at 10% p.a. compound interest, compounded annually.
If Amit repays the loan in two equal annual instalments, what is the amount of each instalment?
(a) ₹12,100
(b) ₹12,600
(c) ₹12,705
(d) ₹12,000

Question 11/22
If $x^2 - 3x + p = 0$ has exactly one root lying between –1 and 2 (excluding –1 and 2), then which of the following is true regarding the range of p?
(a) (–8, –5)
(b) (–4, 2)
(c) (3, 8)
(d) (3, 11)

Question 12/22
In a colony of 32 families, each represented by a married couple at a get-together:

- Each woman exchanges a gift with every other person except her spouse.
- No gifts are exchanged between men.
  How many gifts were exchanged in total?

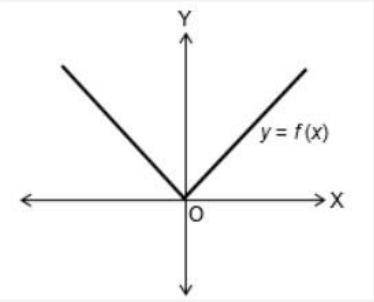
Question 13/22
There are four magic boxes: A, B, C, and D with 7, 2, 3, and 10 toffees respectively.
If the number of toffees in each box doubles every second, then after 256 years, which pair of boxes will have the closest number of toffees?
(a) A and B
(b) B and C
(c) C and D
(d) A and D

Question 14/22
A square UVWX is inscribed in a circle, which is in turn circumscribed by square PQRS.
If the area of the circle is 64π sq. cm, what is the area of the shaded region (area of PQRS − area of UVWX)?
(a) 32 sq.cm.
(b) 16 sq.cm.
(c) 48 sq.cm.
(d) 64 sq.cm.

Mock Test 6

Question 15/22

In the coordinate plane, the reflection of a graph in a line is done by treating the line as a 'mirror', exactly halfway between each point on the graph and its corresponding reflection. Given below is the graph of $f(x)$.



If the graph of $f(x)$ is reflected in the line $y - 1 = 0$, to obtain the graph of $g(x)$, in which of the following lines should the graph of $g(x)$ now be reflected to obtain the graph of $f(x)$?

Which of the following equations represents the solution set of a given curve?

(a) y + 1 = 0

(b) y − 1 = 0

(c) y + 2 = 0

(d) y − 2 = 0

Question 16/22

Two rice varieties P and Q cost ₹42/kg and ₹50/kg respectively.

24 kg of Q is mixed with *n* kg of P and the mixture is sold at ₹60/kg to realize a profit of 25%.

If the ratio is reversed (i.e., P:Q is 24:n), what should be the new selling price per kg for the same 25% profit?

(a) ₹52

(b) ₹48

(c) ₹55

(d) ₹56

Question 17/22

Find the sum up to 30 terms of the series:

S = 2 + 6 + 12 + 20 + 30 + …

Question 18/22

A shopkeeper sells three types of stationary packs:

- Type 1: 3 pencils, 4 erasers, 6 sharpeners
- Type 2: 5 pencils, 2 erasers, 3 sharpeners
- Type 3: 4 pencils, 3 erasers, 5 sharpeners
  A person wants to buy exactly 55 pencils, 50 erasers, and 75 sharpeners.
  How many packs of Type 3 must he buy?

Mock Test 6

Question 19/22

How many positive integral solutions of the equation $x_1 + x_2 + x_3 + x_4 = 20$ exist such that $x_1 > x_2$?

Question 20/22

What is the total number of digits in the product $2^5 \times 5^6 \times 10^7$?

(a) 7

(b) 8

(c) 11

(d) 9

Question 21/22

The magnitude of profit is one-third of the discount offered.

If the discount offered is 37.5%, find the profit percentage.

(a) 20%

(b) 40%

(c) 25%

(d) 12.5%

Question 22/22

A number divided by a certain divisor leaves a remainder of 8.

When the square of the number is divided by the same divisor, the remainder obtained is 6.

How many possible values can the divisor assume?

(a) 3

(b) 4

(c) 1

(d) 2

Mock Test 6

Answer Key

1. **(b) {1}**
2. **96**
3. **33**
4. **33**
5. **(d) 105**
6. **(a) 7 : 4**
7. **0**
8. **(a) 5:1**
9. **64**
10. **(a) ₹12,100**
11. **(b) (–4, 2)**
12. **2976**
13. **(b) B and C**
14. **(a) 32 sq.cm.**
15. **(b) y – 1 = 0**
16. **(c) ₹55 per kg**
17. **9920**
18. **0**
19. **444**
20. **(d) 9**
21. **(c) 25%**
22. **(d) 2**