

NIACL AO MOCK TEST 2

Q 1. Find the value of

$$[(0.31 \times 0.31 \times 0.31) + (0.031 \times 0.031 \times 0.031)] / [(0.93 \times 0.93 \times 0.93) + (0.093 \times 0.093 \times 0.093)]$$

1. $1/25$
2. $1/27$
3. $1/15$
4. $1/16$

Q 2. Find the HCF of $3^2 * 3^5 * 2^2 * 5 * 2^4$

1. 180
2. 90
3. 60
4. 240

Q 3. If $\frac{1}{8}$ of a pencil is orange, $\frac{1}{2}$ of the remaining is Green and the remaining $3\frac{1}{2}$ is black, find the complete length of the pencil.

1. 8
2. 6
3. 10
4. 12

Q 4. Find the values of the expression

$$1 - 6 + 2 - 7 + 3 - 8 + \dots \text{ To 100 terms}$$

1. 250
2. -250
3. -300
4. 400

Q 5. The average of 11 consecutive numbers is n. If the next two numbers are also included, the average will

1. Increase by 2
2. Increase by 1
3. Increase by 1.4

4. Remain the same

Q 6. The average age of a group of people going for a fair is 30 years. 10 new persons with an average age of 20 years join the group on the spot due to which the average of the group becomes 25 years. Find the persons initially going for the movie.

1. 25
2. 30
3. 10
4. 20

Q 7. If a and b are positive numbers such that $a^b = b^a$ and $b = 9a$. The value of a is

1. $9^{1/9}$
2. $9^{1/12}$
3. $9^{1/5}$
4. $9^{1/8}$

Q 8. A person sells a smartphone set for Rs 33000 and makes a profit of 10%. He sells another smartphone at a loss of 20%. If on the whole, he neither gains nor loses, find the selling price of the second TV set.

1. 12000
2. 17000
3. 25900
4. 30000

Q 9. Find the next number in the series.

2, 7, 16, 33, 68, ?

1. 201
2. 131
3. 175
4. 95

Directions (10-14): Study the information carefully and answer the given questions.

A, O, C, S, E, F and G are travelling in a train compartment with an III-tier sleeper berth. Each of them has a different profession of Engineer, Doctor, Architect, Pharmacist, Lawyer, journalist and pathologist. They occupied 2 lower berths, 3 middle berths and 2 upper berths. A, the engineer is not on upper berth. The Architect is the only other person who occupies the same type of berth as that of A. O and F are not on Middle berth and their professions are Pathologist and Lawyer respectively. C is a

Pharmacist. G is neither a Journalist nor an Architect. E occupies the same type of berth as that of Doctor.

Q 10. Who is the Architect?

1. G
2. F
3. S
4. Data inadequate

Q 11. What is G's profession?

1. Pharmacist
2. Lawyer
3. Doctor
4. Engineer

Q 12. Which of the following pairs occupy the lower berth?

1. AC
2. AD
3. AE
4. None of these.

Q 13. Which of the following groups occupies the middle berth?

1. GEC
2. FEC
3. GES
4. GFC

Q 14. Which of the following combinations of person-berth-profession is correct?

1. E - Upper - Lawyer
2. G - Upper - Doctor
3. O - Lower - Journalist
4. S - Lower - Architect

Directions (15-18): Study the information carefully and answer the questions given below:

- I) 8 persons P, Q, R, S, T, U, V and H works in 3 different companies X,Y and Z
- II) There are 2 ladies who work in different companies and their specialization is also different.

- III) 2 of them have specialisation in Finance, another 2 have specialisation in Human Resources, two have specialisation in Marketing, one is Engineer and one of them is a specialist in Computer.
- IV) S is a specialist in Human Resource working in Company X while her friend V is a finance specialist and works in Company Z.
- V) H is a Human Resource specialist who works with Marketing specialist Q but does not work in Company Y.
- VI) The 2 persons with same specialisation do not work together.
- VII) Marketing specialist U works in Company Y and his friend P who is finance specialist works in Company X with only 1 other specialist.
- VIII) In no company more than 3 persons work.
- IX) R is an Engineer and his sister works in Company Z
- X) No lady is an engineer or computer specialist

Q 15. In which company does R work?

1. X
2. Y
3. Z
4. Either Y or Z

Q 16. In which 2 companies do Human Resource Specialists work?

1. X and Y
2. Y and Z
3. X and Z
4. Data inadequate

Q 17. The two ladies are

1. Q and S
2. S and V
3. S and H
4. Either (A) or (B)

Q 18. Who is Computer specialist?

1. R
2. T
3. H
4. Data inadequate

Directions (19-22): Find the pair that matches with the pair given in bold.

Q 19. Birds: Ornithology

1. Fossils: Phycology
2. Algae: Palaeontology
3. Diseases: Pathology
4. Man: Zoology

Q 20. Prism: Glass

1. Fabric: Yarn
2. Cloth: pulp
3. Wine: Milk
4. Butter: Grapes

Q 21. Doctor: Stethoscope

1. Blacksmith: Saw
2. Labourer: Anvil
3. Gardener: Harrow
4. Carpenter: Spade

Q 22. Car: Garage

1. Medicine: Granary
2. Grains: Dispensary
3. Bees: Apiary
4. Clothes: Cellar

Directions (23-25): Fill in the blanks with the appropriate word

Q 23. It is now customary to blame economics or economists for many of the world's ills. Critics hold economic theories responsible for rising inequality, ----- of good jobs, financial fragility, and low growth, among other things.

1. Plenitude
2. Opulence

3. Dearth
4. Plenty

Q 24. Economics and Public Policy are closely related, but they are not the same, and should not be seen as such. Economics is to public policy what physics is to engineering, or biology to medicine. While Physics is fundamental to the design of the rockets that can use energy to ----- gravity, Issac Newton was not responsible for the Challenger space shuttle disaster. Nor was Bio-Chemistry to blame for Michael Jackson's death.

1. Defy
2. Implement
3. Comply with
4. Execute

Q 25. Although Engineering schools teach Physics and Medical Schools teach Biology, these professional disciplines have grown separate from their underlying sciences in many respects. In fact, by developing their own criteria of excellence, curricula, journals and career paths, Engineering and Medicine have become ----- species.

1. Distinct
2. Blurred
3. Fuzzy
4. Hasty

Answer Keys

Q 1. 2	Q 2. 1	Q 3. 1	Q 4. 2	Q 5. 2
Q 6. 3	Q 7. 4	Q 8. 1	Q 9. 2	Q 10. 3
Q 11. 3	Q 12. 4	Q 13. 1	Q 14. 4	Q 15. 2
Q 16. 3	Q 17. 4	Q 18. 2	Q 19. 3	Q 20. 1
Q 21. 3	Q 22. 3	Q 23. 3	Q 24. 1	Q 25. 1

Solution 1:

$$[(0.31 \times 0.31 \times 0.31) + (0.031 \times 0.031 \times 0.031)] / [(0.93 \times 0.93 \times 0.93) + (0.093 \times 0.093 \times 0.093)]$$

Let $a=0.31$ and $b= 0.031$

$$\text{Given expression} = (a^3 + b^3) / [(3a)^3 + (3b)^3] = (a^3 + b^3) / 27 (a^3 + b^3) = 1/27$$

Solution 2:

HCF can be found by finding the product of the least powers of prime factors.

$$\text{Hence, } 2^2 * 3^2 * 5 = 4 * 9 * 5 = 180$$

Solution 3:

Let the total length of pencil be x cm. Then,

$$\text{Orange part} = (x / 8) \text{ cm. Remaining part} = [x - (x / 8)] \text{ cm} = (7x / 8) \text{ cm.}$$

$$\text{Green part} = [(1/2) \times (7x / 8)] \text{ cm} = (7x / 16) \text{ cm}$$

$$(7x / 16) = 7/2$$

Hence, the total length of pencil = 8 cm.

Solution 4:

The above expression in the question can be rewritten as

$$(1 + 2 + 3 + 4 + \dots \text{to } 50 \text{ terms}) - (6 + 7 + 8 + 9 + \dots \text{To } 50 \text{ terms})$$

Sum to n terms is given by the equation

$$S_n = n / 2 [2a + (n-1) d]$$

Number of terms $n = 50$,

Common difference $d = 1$

The first term of the sequence is given by 'a'

For the 1st expression

$$(1 + 2 + 3 + 4 + \dots \text{to } 50 \text{ terms})$$

We can see that $a = 1$, $d = 1$, $n = 50$

$$S_n = 50 / 2 [2 \times 1 + (50 - 1) 1]$$

$$S_n = 25 [2 + 49] = 25 [51]$$

In the 2nd expression

$$(6 + 7 + 8 + 9 + \dots \text{To } 50 \text{ terms})$$

All the terms are same except a where $a = 6$

$$S_n = 50 / 2 [2 \times 6 + (50 - 1) 1]$$

$$S_n = 25 [12 + 49] = 25 [61]$$

Hence,

$$(1 + 2 + 3 + 4 + \dots \text{to } 50 \text{ terms}) - (6 + 7 + 8 + 9 + \dots \text{To } 50 \text{ terms})$$

$$= 25 [51] - 25 [61]$$

$$= - 250$$

Solution 5:

Let the 11 terms be given as $a+1, a+2, a+3, a+4, a+5, \dots, a+11$

Average of the above terms is $a + 6$.

Adding 2 more terms will give the expression, $a+1, a+2, a+3, a+4, a+5, \dots, a+11, a+12, a+13$

Average of the above terms is $a + 7$.

From the above solution, we can find that average increases by 1

Solution 6:

Let the initial number of people be represented by 'x'.

Hence the total age of the group = $30x$.

10 new persons with an average of 20 years join the group, the total weight of the new group

$$= 10 \times 20 = 200.$$

Now the new average age of the complete group is 18 years.

So we can get a new equation,

$$30x + 200 = 18(x + 10)$$

$$30x - 18x = 180 - 200$$

$$12x = 20$$

$$x = 10$$

Solution 7:

As per question $b = 9a$

Hence $b / a = 9$

$$a^b = b^a$$

Raising both the sides to the power $1/a$

$$(a^b)^{1/a} = (b^a)^{1/a}$$

$$(a)^{b/a} = b$$

From above we can see that $b/a = 9$

$$(a)^9 = b$$

From the above as $b = 9a$

$$\text{Hence, } a^9 = 9a$$

$$(a)^{9-1} = 9$$

$$(a^8) = 9$$

$$\text{Hence, } a = 9^{1/8}$$

Solution 8:

When the 1st TV is sold for Rs 33000 at 10% profit, the Cost price of the TV is

$$X(1.1) = 33000$$

$$\text{Cost price } X = \text{Rs } 30,000$$

$$\text{Therefore the profit made is Rs } 33,000 - \text{Rs } 30,000 = \text{Rs } 3,000$$

As the question says he neither gains nor loses, his profit amount from selling the 1st tv set is the same as the loss amount that he incurred while selling the 2nd tv set.

$$20\% \text{ of CP} = \text{Rs } 3000$$

$$\text{CP} = \text{Rs } 15,000/-$$

$$\text{Hence Selling Price} = 15000 - 3000$$

$$= \text{Rs } 12,000$$

Solution 9:

$$2 + (2^2 + 1) = 7$$

$$7 + (2^3 + 1) = 16$$

$$16 + (2^4 + 1) = 33$$

$$33 + (2^5 + 1) = 66$$

$$66 + (2^6 + 1) = 131$$

Solution 10:

The Architect is the only other person who occupies the same type of berth as A, the Engineer. And since the Engineer is not on the upper berth, so he and the Architect must be on the lower berth, as three persons occupy middle berth.

O and F are not on middle berth and their professions are pathologist and lawyer respectively. Since lower berths are occupied by Engineer and Architect, hence pathologist and lawyer occupy upper berths and the Doctor, Pharmacist, and Journalist occupy the middle berths.

Now C is a pharmacist. D is neither a Journalist nor an Architect. So G is a Doctor. Since E occupies the same type of berth as the doctor, so E is a journalist. Finally, S is an Architect.

Passenger	A	O	T
Berth	Lower	Upper	Middle
Occupation	Engineer	Pathologist	Pharmacist

Passenger	S	E	F	G
Berth	Lower	Middle	Upper	Middle
Occupation	Architect	Journalist	Lawyer	Doctor

Solution 11:

From the above table, we can see that the Doctor is the answer.

Solution 12:

From the above table, we can see that none of the pairs given in the option occupies the lower berth.

Solution 13:

From the above table, we can see that GEC occupies the middle berth.

Solution 14:

From the above table, we can see that the 4th option is the right combination.

Solution 15:

From the below table we can see that Y is the answer.

Person	Gender	Specialisation	Company
P	Male	Finance	X
Q	Male/Female	Marketing	Z
R	Male	Engineer	Y
S	Female	Human Resource	X
T	Male	Computer	Y
U	Male	Marketing	Y
V	Male/Female	Finance	Z
H	Male	Human Resource	Z

S and H specialize in Human Resource, V and P in Finance, Q and U in Marketing. R is an Engineer. So T is a Computer Specialist.

Now, H and Q work together but not in Company Y. Also, S and H have the same specialisation. So, H does not work in the same company as S i.e. X. Thus, H and Q work in Company Z. Only S and P work in Company X; V, H and Q work in Company Z. Since not more than 3 persons work in any one company, U, R and T work in Company Y.

Since 2 females work in different companies, so S being a female, the other person in Company X i.e. P is a male. U is a male. R, being an Engineer and T, being a Computer Specialist are both males.

Since S is a female, so the specialization of the other female cannot be the same as that of S i.e. Human Resources. So H is a male. Thus, either Q or V is the other female.

Solution 16:

From the above table, we can find that X and Z is the answer.

Solution 17:

From the above table, we can find that the answer is either A or B

Solution 18:

From the above table, we can find that T is a computer specialist.

