Maths Questions for CLAT Exam.

CLAT Maths Quiz 12

Directions: Kindly study the following Questions carefully and choose the right answer:

1. A single person takes 10 minutes to stitch a bag. If from 10.00 a.m. to 12.30 p.m., 1245 bags are to be stitched how many persons should be employed on this job?

A. 81

B. 82

C. 83

D. 84

2. A merchant has 1000 kg of sugar, part of which he sells at 8% profit and the rest at 18% profit. He gain 14% on the whole. The quantity sold at 18% profit is

A. 500 kg

B. 600 kg

C. 400 kg

D. 640 kg

3. Shobha's Mathematics test had 75 problems i.e. 10 arithmetic, 30 algebra and 35 geometry problems. Although she answered 70% of the arithmetic, 40% of the algebra and 60% of the geometry problems correctly, she did not pass the test because she got less than 60% of the problems right . How many more question she would have needed to answer correctly to earn a 60% passing grade?

A. 2

B. 4

C. 5

D. 7

4. Two equal circles of radius 4 cm intersect each other such that each passes through the centre of the other. The length of the common chord is :

A. 2√3 cm

B. 4√3 cm

C. 2√2 cm

D. 8 cm

5. Find the least number which when divided by 5, 6, 7 and 8 leaves a remainder 3, but when divided by 9 leaves no remainder.

A. 1683

B. 2312

C. 1432

D. 798

6. A rectangular block 6 cm by 12 cm by 15 cm is cut up in to an exact number of equal cubes. Find the least possible number of cubes.

A. 10

B. 20

C. 30

D. 40

7. The shadow of a tower is 15 m when the sun's elevation is 30°. What is the length of the shadow when the sun's elevation is 60°?

A. 3 m

B. 4 m

C. 5 m

D. 6 m

8. If 3x4 – 2x3 + 3x2 – 2x + 3 is divided by (3x + 2), then the remainder is

A. 0

B. 185/27

C. 181/25

D. 3/4

9. What is be the compound interest (in Rs.) accrued on an amount of Rs. 15000 at the rate of 20 per cent annum in two years, if the interest is compounded half-yearly?

A. 6196.5

B. 6916.5

C. 4641.5

D. 6961.5

10. The rates of simple interest in two banks x and y are in the ratio of 10 : 8. Rajini wants to deposit her total savings in two banks in such a way that she receives equal half-yearly interest from both. She should deposit the savings in banks x and y in the ratio of

A. 4 : 5

B. 3 : 5

C. 5 : 4

D. 2 : 1

Correct Answers:

1	2	3	4	5	6	7	8	9	10
C	B	C	B	A	D	C	B	D	A

Explanations:

1. To solve this question, we can apply a short trick approach

$M_1D_1W_2 = M_2D_2W_1$

Gievn,

$M_1 = 1$, $D_1 = 10$ mins, $W_2 = 1245$

$M_2 = x$, $D_1 = 2h + 30$ mins = 150 mins, $W_1 = 1$

By the short trick approach, we get

= 1 × 10 × 1245 = x × 150 × 1

$x = \dfrac{1245 \times 10}{150}$ = 83 Persons

Hence, option C is correct.

2. Let the sugar sold at 8% gain = x

∴ Sugar sold at 18% gain = (1000 – x)

Let CP of sugar = Rs. y per kg

Total CP = Rs. 1000y

∴ $(\dfrac{108}{100} \times xy) + \dfrac{118}{100}(1000 - x)y = \dfrac{114}{100} \times 1000y$

⇒ 108xy + 118000y – 118xy = 114000y

⇒ 10x = 4000

∴ x = 400

∴ Quantity sold at 18% profit = (1000 – 400) kg = 600 kg

Hence, option B is correct.

3. Number of questions attempted correctly = (70% of 10 + 40% of 30 + 60% of 35)

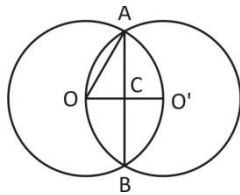⇒ (7 + 12 + 21) = 40.

Questions to be answered correctly for 60% grade = 60% of 75 = 45.

So, Required number of questions = (45 − 40) = 5.

Hence, option (C) is correct.

4.

Radius, OA = 4 cm

∴ OC = 2 cm

By Pythagoras theorem in ΔAOC,

∴ AC = $\sqrt{4^2 - 2^2}$ = $\sqrt{12}$ = $2\sqrt{3}$ cm

∴ AB = $2\sqrt{3}$ + $2\sqrt{3}$ = $4\sqrt{3}$ cm

Hence, option B is correct.

5. L.C.M. of 5, 6, 7, 8 = 840.

∴ Required number is of the form 840k + 3.

Least value of k for which (840k + 3) is divisible by 9 is k = 2.

∴ Required number = (840 × 2 + 3) = 1683.

Hence, option A is correct.

6. Volume of the block = $(6 \times 12 \times 15)$ cm^3 = 1080 cm^3.

Side of the largest cube = H.C.F. of 6 cm, 12 cm, 15 cm = 3 cm.

Volume of this cube = $(3 \times 3 \times 3)$ cm^3 27 cm^3

∴   Number of cubes = $(\dfrac{1080}{27})$ = 40.

Hence, option D is correct.

7.

Given, $\angle ADB = 30°$
      $\angle ACB = 60°$
when the sun's elevation is 30°, the shadow of tower is
      $BD = 15$ m
and when the sun's elevation is 60°, the shadow of tower is
      $BC = ?$
Let, $BC = x$ m
In $\triangle ABD$, $\tan 30° = \dfrac{AB}{BD}$

      $\dfrac{1}{\sqrt{3}} = \dfrac{AB}{15}$

∴ $AB = \dfrac{15}{\sqrt{3}}$ ...(i)

In $\triangle ABC$, $\tan 60° = \dfrac{AB}{BC}$
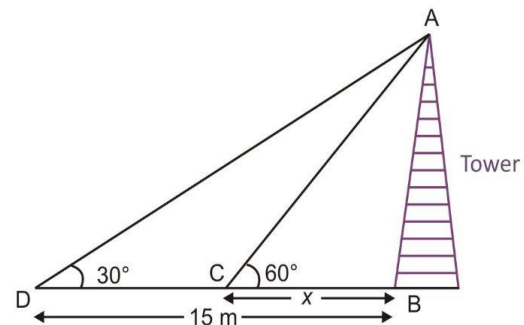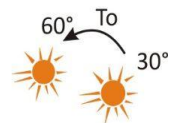
      $\sqrt{3} = \dfrac{AB}{x}$

∴ $AB = x\sqrt{3}$ ...(ii)

From Eqs. (I) and (ii), we get

      $x\sqrt{3} = \dfrac{15}{\sqrt{3}}$

      $X = 5$ m

Hence, option C is correct.

8. $f(x) = 3x^4 - 2x^3 + 3x^2 - 2x + 3$

$(3x + 2) = 0 \Rightarrow x = \dfrac{-2}{3}$

Remainder = $f\ (\dfrac{-2}{3}) = 3\ (\dfrac{-2}{3})^4 - 2\ (\dfrac{-2}{3})^3 + 3\ (\dfrac{-2}{3})^2 - 2\ (\dfrac{-2}{3}) + 3$

$= 3 \times \dfrac{16}{81} - 2 \times \dfrac{-8}{27} + 3 \times \dfrac{4}{9} + \dfrac{4}{3} + 3$

$$= \frac{16}{27} + \frac{16}{27} + \frac{4}{3} + \frac{4}{3} + 3 = \frac{32}{27} + \frac{8}{3} + 3$$

$$= \frac{32 + 72 + 81}{27} = \frac{185}{27}$$

Hence, option B is correct.

9. Rate of interest (half yearly) = 20/2 = 10%

Now, P = 15000, T = 2 = 4 half years

By the net% effect we would calculate the effective compound rate of interest for 4 half years = 46.41% (Refer to sub-details)

Therefore, CI = 46.41% of 15000

$$CI = \frac{46.41 \times 15000}{100} = Rs. \ 6961.5$$

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Sub-details:

Calculation of effective compound rate of interest for 4 half years will be as follows.
For the first 2 half years, let's apply the net% effect.

Here, x = y = 10%

$$Net\% \ effect = x + y = \frac{xy}{100}$$

$$= 10 + 10 + \frac{10 \times 10}{100} = 21\%$$

Now let's take this 21% as x and 10% as y for the calculation of 3rd half year.

$$= 21 + 10 + \frac{21 \times 10}{100} = 33.1\%$$

Similarly, let's take this 33.1% as x and 10% as y for the calculation of 4th half year.

$$= 33.1 + 10 + \frac{33.1 \times 10}{100} = 43.1 + 3.31 = 46.41\%$$

Traditional Method:

If interest is compounded half-yearly then time (t) = 2 × 2 = 4; r% = 20/2 = 10%

$$A = P(1 + \frac{R}{100})^t$$

Or

$$= 15000(1 + \frac{10}{100})^4$$

$$= 15000 \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10} = \text{Rs. } 21961.5$$

∴ CI = 21961.5 – 15000 = Rs. 6961.5

Hence, option D is correct.

10. Let the savings be P and Q and rates of SI be 10x and 8x, respectively.

Then, $P \times 10x \times \frac{1}{2} \times \frac{1}{100} = Q \times 8x \times \frac{1}{2} \times \frac{1}{100}$

⇒ 10P = 80

∴ $\frac{P}{Q} = \frac{8}{10} = \frac{4}{5}$

∴ P : Q = 4 : 5.

Hence, option A is correct.