BYJU'S EXAM PREP

CSIR NET Exam 2022 Exam Analysis (15th February)

Memory Based Questions

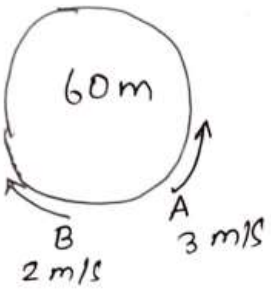
Memory Based Questions (Quantitative Aptitude)

Topic: Speed Distance and Time

Ques 1: If A and B start from the same point in opposite dimensions and if the speed of B is 2/3 times the speed of A, then how many times they will meet until they reach the starting point

Solution: Let be the speed of A = 3

And B's speed be = $\frac{2}{3} \times 3 = 2$



So, relative speed = 3 + 2 = 5

Both will meet = $\frac{60}{5} = 12\,\text{sec}$

i.e. Both will meet every 12th sec

$\therefore$ Both will meet at starting point

$$\frac{60}{2} = 30\,\text{sec} \text{ and}$$

$$\frac{60}{3} = 20\,\text{sec}$$

LCM of 30 and 20 = 60

i.e. after 60 sec they will meet as starting point.

$\because$ 12 sec × 5 i.e. they will meet 4 times until they meet at starting point.

Topic: Geometry

Ques 2. A right-angled triangle is embedded in a circle of radius r. Determine the maximum area of Δ.

A. $\Delta = 2R^2$

B. $\frac{1}{r^1} + \frac{1}{r^2} + \frac{1}{r^3} = \frac{\sqrt{2}+1}{R}$

C. $r = \left(\sqrt{2}-1\right)R$

D. $S = \left(1+\sqrt{2}\right)R$

Answer: B

Solution:

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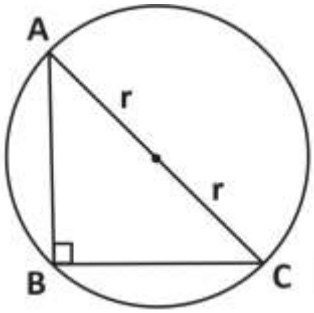


If a right angled triangle inscribed in a circle of radius R, the length of the hypotenuse is 2R.

The area is maximum when the triangle is isosceles with each side = $\sqrt{2R}$

Hence,

$$S = \frac{1}{2}\left(2\sqrt{2}+2\right)R = \left(\sqrt{2}+1\right)R$$

$$\therefore \Delta = \frac{1}{2}\sqrt{2}R.\sqrt{2}R = R^2 = \frac{1}{r} = \frac{\left(\sqrt{2}+1\right)}{R}$$

$$\therefore \frac{1}{r^1} + \frac{1}{r^2} + \frac{1}{r^3} = \frac{s-a}{\Delta} + \frac{s-b}{\Delta} + \frac{s-c}{\Delta} = \frac{1}{r} = \left(\frac{\sqrt{2}+1}{R}\right)$$

Topic: Probability

Ques 3. In 8 teams, each team will play another team twice. They get 3 points for the win, 1 for a draw and 0 for a loss. Then how many max points can be earned for all teams?

Solution: Let suppose each team plays asingle match agaisnt all team

So, no. of matches = ${}^{8}C_{2}$ = 28 matches

Now, as each team plays the other team twice.

Total no. of matches = 2 × (28) = 56 matches

If all matches here result = 56 × (3) = 168 points

If all matches are tied = 56 × 1 × 1 = 56 points (Both team gets 1 point)

Topic: Statistics

Ques 4. Which one of the following will have the smallest mean value

A. 1, 2, 3, 4, 5, 6, 7, 8, 9

B. 1, 2, 3, 4, 6, 6, 7, 8, 9

C. 1, 2, 2, 4, 5, 6, 7, 8, 9

D. 1, 2, 2, 3, 5, 6, 7, 8, 9

Solution: We know the mean is also treated as average.

So, here the smallest mean means the set of numbers whose average is least.

So,
$$\frac{1+2+3+4+5+6+7+8+9}{9} = \frac{45}{9} = 5$$

$$\frac{1+2+3+4+6+6+7+8+9}{9} = \frac{46}{9} = 5.11$$

$$\frac{1+2+2+4+5+6+7+8+9}{9} = \frac{44}{9} = 4.88$$

$$\frac{1+2+2+3+5+6+7+8+9}{9} = \frac{43}{9} = 4.77$$

Hence, the least mean value is correct for option (D).

Topic: Statistics

Ques 5. If AM and GM of two numbers are 65 and 25, Then what is the number?

Solution: Let the two number be 'a' and 'b'

So, condition of AM = $\frac{a+b}{2} = 65 = a + b = 130$

Condition of GM

$\sqrt{a \times b} = 25 = ab = 625$

Now by putting options we can find the two no. a and b are 125 and 5 respectively.

Topic: Mathematical Operations

Ques 6. If '+' means '–', '–' means ' ×', ' ×' means '÷', '÷' means ' +'

Then (11 + 4 – 2) ÷ 24 × 6

Solution: (11 – 4 × 2) + 24 ÷ 6

By Bodmas rule :

=(11 – 8) + 4

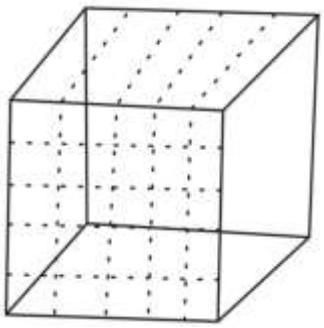
=3 + 4 i.e. 7

Topic: Probability

Ques 7. If a solid cube of each side is 5 units is painted. If it is cut into pieces of the cube of 1 unit, then what is the probability of getting a cube which is one-sided pieces.?

Solution: Let be the no. of smaller cubes be 'n'.

Here n = 5



Now, total small cubes = $\frac{5 \times 5 \times 5}{1 \times 1 \times 1} = 125$

If 1 face painted then, $= 6 \times (n-2) \times (n-2)$

$= 6 \times 3 \times 3$

$= 54$

There probability (P) $= \frac{54}{125}$

Memory Based Questions (Reasoning)

Topic: Blood Relationship

Ques 8. A group of 5 members, 2 people are real siblings, others are cousins. Then how many real sibling pairs can be formed?

Solution: Here 1 pair is confirmed given

According to the question-

Other are cousins means 3 could be brother and sister itself

So, here from 3 people, 3 pairs can easily be made.

Hence, 3+1= 4 pairs can be made.

Topic: Data Sufficiency

Ques 9. Out of A, B, C people are truthful. If A tell B a lies and B tell C a lies, then which of the following is correct.

A. A is truthful

B. B is truthful

C. C is truthful

D. At least one is lies

Solution: From statement 'A', 'B' lies

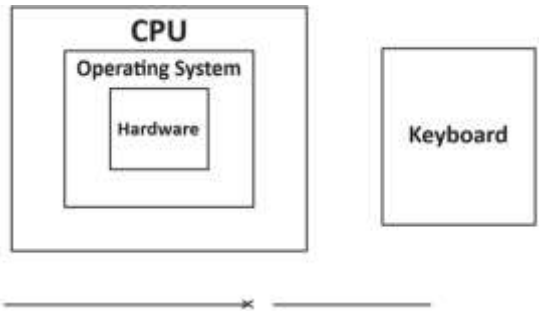
From statement 'B', 'C' is truthful

So, from the above statement we can say C is truthful, because there is no such data available about 'A'. Hence, from the data above we can say 'C' is truthful.

Topic: Logical Venn Diagram

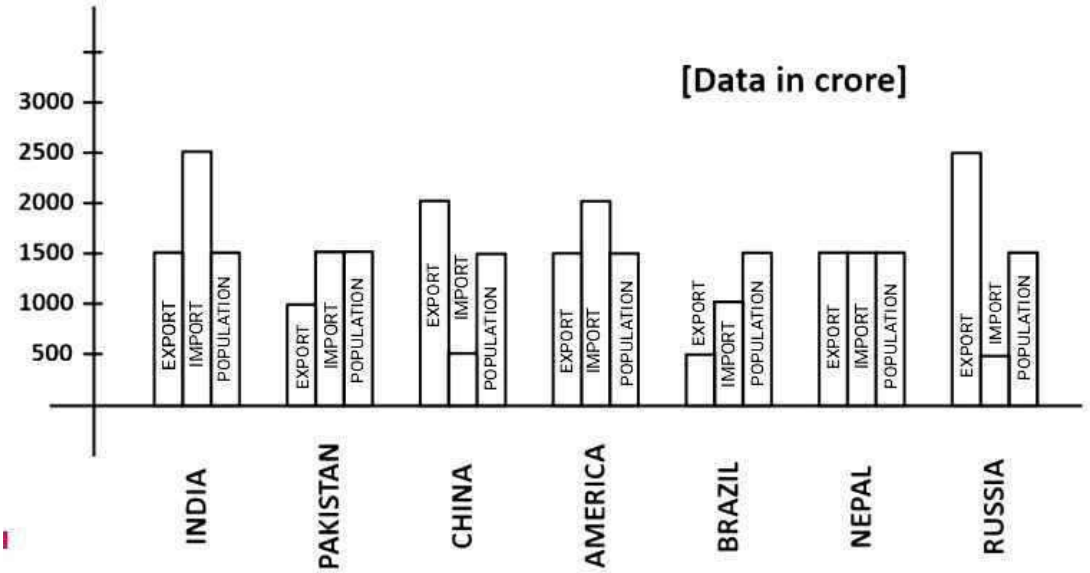
Ques 10. What would be the correct representation of the following Keyboard, Operating system, Hardware, CPU ?

Solution:



Memory Based Questions (DI)

Ques 11. A bar graph was given of 7 countries in a set of 3, representing its export, import and population. Find out which countries is highly established and which one is least established.



Solution : Here we can see that the population of every country is equal.

So, for finding which country is more or less established, then we need to find out the percentage of export to import.

$$\text{India} = \frac{E}{I} \times 100 = \frac{1500}{2500} \times 100 = 60\%$$

$$\text{PAK} = \frac{E}{I} \times 100 = \frac{1000}{1500} \times 100 = 66.66\%$$

$$\text{CHINA} = \frac{E}{I} \times 100 = \frac{2000}{500} \times 100 = 400\%$$

$$\text{AMERICA} = \frac{E}{I} \times 100 = \frac{1500}{2000} \times 100 = 75\%$$

$$\text{BRAZIL} = \frac{E}{I} \times 100 = \frac{500}{1000} \times 100 = 50\%$$

$$\text{NEPAL} = \frac{E}{I} \times 100 = \frac{1500}{1500} \times 100 = 100\%$$

$$\text{RUSSIA} = \frac{E}{I} \times 100 = \frac{2500}{500} \times 100 = 500\%$$

We can say export to import % of Russia is highest i.e. 500% and export to import % of Brazil is lowest i.e. 50%. Hence, RUSSIA is most established and Brazil is least established.

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