# Maths Questions for RBI Grade B Phase - 1 Exam.

## RBI Grade B Maths Quiz 2

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

**1. In St. Peter's college Agra an exhibition was organised, hand-made crafts are displayed for sale. Some students are assigned the work of selling crafts. The overall profit p depends on the number of students x selling the crafts on that particular day and is given by the equation p = 250x – 5x2. The school manager claims to have made a maximum profit. Find the number of students engaged in selling the crafts and the maximum profit made.**

A. 25 and Rs. 1800 B. 25 and Rs. 2900 C. 25 and Rs. 3125 D. 30 and Rs. 3900
E. None of these

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**2. Virat prepares a budget to visit New York. However, he spends 12% of his budget on the first 10% days of his travel when he stays in the city. He knows that he has to spend another 35% of days in city itself, after which he would travel to the country side. What should be the minimum decrease in spending in country side as a percentage of his spending in city so as to complete his travel on the initial budget itself?**

A. 33.33% B. 30.3% C. 25% D. 32.23% E. None of these

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**3. Class A has boys to girls in the ratio 2 : 3, Class B has girls to boys in the ratio 5 : 3. If the number of students in Class A is at least twice as many as the number of students in Class B, what is the minimum percentage of boys when both classes are considered together?**

A. 33.33% B. 40% C. 39.17% D. 37.5% E. None of these

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**4. Rahul Gandhi borrowed Rs.6240 from Manoj Tiwari on September 1 and promised to repay it by the end of the month. Manoj Tiwari put forth a condition that Rahul Gandhi should repay an amount each day and that the difference between the amounts paid in any two consecutive days should be Rs.10, i.e. the amount to be paid on a particular day (except the first day) should be Rs.10 more than the amount paid on the previous day. How much did she pay Manoj Tiwari on September 1?**

A. Rs. 98 B. Rs. 67 C. Rs. 35 D. Rs. 45 E. None of these

**5. Life Insurance Company issues semi-prime, prime and most prime policies. Among the company's policy holders of a certain age, 50% are semi- prime with a probability of 0.01 of dying in the next year, 30% are prime with a probability of 0.008 of dying in the next year and 20% are most prime with a probability of 0.007 of dying the next year. If a policy holder of that age dies in the next year, what is the probability of the deceased being a prime policy holder?**

A. 0.1591 B. 0.2727 C. 0.375 D. 0.265 E. None of these

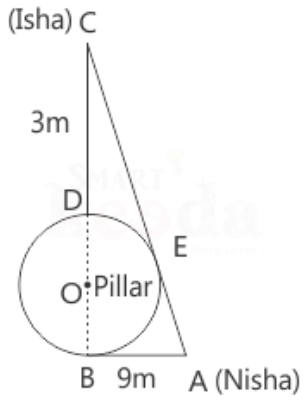
**6. The following table gives the percentage breakdown of the total marks obtained by 5 students Ajay, Bijay, Chandan, Divya and Monica in 6 subjects, Physics, chemistry, Math, Hindi, English and Biology, of their final exams. The maximum marks in each subject are 100 and every student got an integral score.**

| | Physics | Chemistry | Math | Hindi | English | Biology |
|---|---|---|---|---|---|---|
| Ajay | 10 | 14 | 22 | 14 | 18 | 22 |
| Bijay | 12 | 17 | 20 | 19 | 15 | 17 |
| Chandan | 15 | 10 | 20 | 15 | 20 | 20 |
| Divya | 15 | 17 | 19 | 25 | 14 | 10 |
| Monica | 16 | 18 | 16 | 18 | 18 | 14 |

**What can be the maximum possible total score achieved by any of these 5 students?**

A. 550 B. 600 C. 580 D. 420 E. None of these

**7. There is a very huge and wide circular pillar in a museum. Two sisters, Nisha and Isha, go for a visit to the museum. Isha is standing at a distance of 3m from the point D of the pillar and Nisha is standing at 9m from the point B of the pillar as shown in the figure. What is the diameter (in m) of the circular pillar if Nisha and Isha can barely see each other and BD is the diameter of the circular pillar with ∠ABC = 90°?**




A. 27 B. 15 C. 9 D. 6 E. 3

**8. In New Delhi, any person consuming water has to pay a fixed charge and an additional amount proportional to the water (in liters) consumed. But if one consumes more than 70 liters per month, one has to additionally pay an amount proportional to the square root of water consumed (in liters). If a person pays Rs.400 for 50 liters, Rs.360 for 30 liters and Rs.510 for 100 liters, how much should he pay for 120 liters?**

A. Rs. 620.25 B. Rs. 595 C. Rs. 550.95 D. Rs. 480.75 E. Rs. 450.33

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**9. A student of IITD orders four brands of pen drive viz. Sony, Toshiba, HP and Sandisk from Amazon. The prices of the pen drives of each of these brands are as follows: Sony, Toshiba, HP and Sandisk as Rs.240, Rs.225, Rs.210 and Rs.200 respectively. After few days later he received the Pen drives. Though the total number of Pen drives delivered were equal to the number he had ordered, the numbers for each brand were not all as per his order. Further the total bill that he received was for Rs.9170 and it did not tally with his original estimate. However the numbers of Toshiba he ordered and received were exactly 20. If the student received 10 Pen drive of Sandisk then what is the total number of Pen drives he received?**

A. 35 B. 38 C. 45 D. 49 E. None of these

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**10. A man goes to Goa for a three-day stay. On the first day he doubles the money he has and spends Rs.160. On the second day he triples the money he has and spends Rs.130. On the third day he quadruples the money he has and spends Rs. 200. If he is left with twice the money he had at the beginning of the first day, how much money did he have at the end of the first day?**

A. Rs. 54 B. Rs. 75 C. Rs. 52 D. Rs. 80 E. None of these

**Correct Answers:**

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

**Explanations:**

**1.** For profit to be maximum, the derivative of p with reference to x must be 0 and hence

$= \frac{d\,(250x - 5x^2)}{dx} = 0 = 250 - 10x = 0$

So x = 25
Now p for x = 25 is
$= 250\,(25) - 5\,(25)^2 = Rs3125$
Hence, option (C) is correct.

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**2.** Budget spent on 10% of days = 12%

So, in 1% of days = $\frac{12}{10}$

35% remaining days in city = $\frac{12}{10} \times 35 = 42$

Overall budget spent on 45% of days in city = 54% Days remaining = 55%, Budget remaining = 46%

In 1% of day remaining, he can spend = $\frac{46}{55}$ of budget

Therefore, % decrease reqd. = $\frac{\frac{12}{10} - \frac{46}{55}}{\frac{12}{10}} \times 100 = 30.33\%$

Hence, option (B) is correct.

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**3.** Let us first rewrite the numbers a touch – 40% of students in Class A are boys, and 37.5% of boys in class B are boys. The overall percentage of boys should lie between these two numbers.
Now, class A has at least twice as many students as class B. So, the overall weighted average should definitely be closer to the percentage of boys in class A, or closer to 40%.
Now, the number of students in class A can be much higher than the number in class B, in which case the overall percentage would practically be 40%. This is the maximum percentage that can be there.
For the minimum percentage, we need to consider the other extreme-where class A has exactly twice as many students as class B.
The weighted average would be

$\frac{2 \times 40\% + 1 \times 37.5}{3} = 39.17\%$

Hence, option (C) is correct.

**4.** Let us assume that Rahul Gandhi paid Rs.x to Manoj Tiwari on September 1. As he has to repay the entire money, i.e., Rs.6240 in 30 days and the amounts paid on any day should be Rs.10 more than the amount paid on the previous day,

$X + X + 10 + X + 20 + \ldots\ldots\ldots + X + 290 = 6,240$

$= \frac{30}{2}(2x + 29 \times 10) = 6240$

$30 (2x + 290) = 12480$

$X = 63$

So, Rahul Gandhi paid Rs.63 to Manoj Tiwari on September l.

Hence, option (E) is correct.

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**5.** The expected number of deaths among all the policy holders of given age (Let X) during next year

$T = \left\{\frac{50}{100}(0.01) + \frac{30}{100}(0.008) + \frac{20}{100}(0.007)\right\}$

T = Total no. of policy holder of age X

$= \frac{T}{100}(0.88)$

If any of these policy holders (who die during next year) is picked at random, the probability that he is Prime policy holder is

$$\frac{30 \times 0.008 \times \frac{T}{100}}{0.88 \times \frac{T}{100}} = \frac{24}{88} = 0.2727$$



Hence, option (B) is correct.

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**6.** In this question, two conditions have to be kept in

The maximum marks in each subject are 100.

Every student got an integral score.

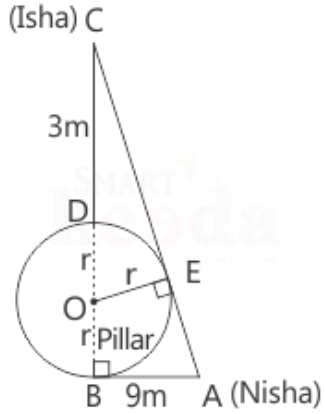
Try out each of the given options (starting with the highest and going in descending order) keeping above two conditions in mind to see if any of the students can have that as their total score. For example, suppose 600 is the maximum possible total score achieved by any of these 5 students. Then, the maximum possible subject wise percentage for this total score

$= \frac{100 \times 100}{600} = 16.7\%$ approx.

In other words, the maximum percentage a student can have in any subject for this score is 16.7%. Now, if there is any student whose percentage breakup in different subjects is less than or equal to 16.7% and also if the marks obtained by him in different subjects are integers (assuming his total score as 600), then 600 is the correct answer. If not, do the same with rest of the options until these two conditions are met. For the first two options, i.e., 600 and 580, there is no such student for whom both of these conditions are met. For the third option, i.e., 550 as the total score, both of these conditions are met for Monica. Therefore, the maximum possible total score achieved by any of these 5 students is 550.

Hence, option (A) is correct.

**7.**




ΔCEO ~ Δ CBA

$\therefore \frac{CE}{CB} = \frac{OE}{AB}$

$\therefore \frac{CE}{3 + 2r} = \frac{r}{9}$

$\therefore CE = \frac{r\,(3 + 2r)}{9}$ .....(i)

Applying Pythagoras theorem in Δ OCE,

$CE^2 = (3 + r)^2 - r^2$

$CE^2 = 9 + 6r + r^2 - r^2$

$\therefore CE = \sqrt{9 + 6r}$ .....(ii)

From (i) and (ii),

$\therefore r^2 (3 + 2r)^2 = 81 (9 + 6r)$

$\therefore r^2 (3 + 2r)^2 = 243 (3 + 2r)$

$\therefore r^2 (3 + 2r) = 243$

Now substituting the options,

only $r = \frac{9}{2}$ satisfies the given equation

So the diameter of the pillar is 9m.

Hence, option (C) is correct.

**8.** Let amount pays = Rs. x
Fixed charge = Rs. y
Let number of liters consumed = L
If anyone consumes less than 70 liters per month, then
Amount pays (x) = fixed charge (y) + k × (number of liters consumed)
Where k being the constant of proportionality
Hence, $x = y + k \times L$
According to the question,
$400 = y + 50 \times k$ **..... (i)**
$360 = y + 30 \times k$ **.....(ii)**
If anyone consumes more than 70 liters per month, then
$x = y + k \times L + p \times \sqrt{L}$, where p being the constant of proportionality
Now, $510 = y + 100 \times k + p \times \sqrt{100}$
$\Rightarrow 510 = y + 100 \times k + 10 \times p$ **..... (iii)**
From equation (i) and (ii), we get
$20 \times k = 40 \Rightarrow k = 2$ and $y = (400 - 50 \times 2) = 300$
Substituting the value of y and k in (iii), we get
$510 = 300 + (100 \times 2) + 10 \times p$

$$\Rightarrow p = \frac{510 - 500}{10} = 1$$

Thus, the amount paid for 120 liters will be
$x = y + k \times L + p \times \sqrt{L}$
$\Rightarrow x = 300 + (120 \times 2) + (1 \times \sqrt{120}) = (300 + 240 + 10.95) = \text{Rs. } 550.95$
Hence, option (C) is correct.



**9.** The prices, quantities and the corresponding amounts for the various brands of Pen drive are tabulated below:

| Brand Name | Price (in Rs.) | Quantity | Total amount |
|---|---|---|---|
| Sony | 240 | p (say) | 240 × p |
| Toshiba | 225 | 20 | 4500 |
| HP | 210 | q (say) | 210 × q |
| Sandisk | 200 | 10 | 2000 |

Given that,
Total amount = Rs. 9170
$\Rightarrow 240 \times p + 4500 + 210 \times q + 2000 = 9170$
$\Rightarrow 240 \times p + 210 \times q = 9170 - 6500$
$\Rightarrow 240 \times p + 210 \times q = 2670$
$\Rightarrow 8 \times p + 7 \times q = 89$
Which is possible only for p = 5 and q = 7
Hence, total number of Pen drives = $(p + 20 + q + 10) = (5 + 20 + 7 + 10) = 42$
Therefore, option (E) is correct.

**10.** If the man starts with Rs. x,

At the end of the first day he has (2x – 160)

At the end of second day he has

3 (2x – 160) – 130 = 6x – 610

At the end of day 3 he has,

4(6x – 610) – 200 = 24x – 2640

Given that

24x – 2640 = 2x

$\Rightarrow$ x = 120

The amount he has at the end of the first day is (2 × 120) – 160 = 80

Hence, the amount at the end of the first day is Rs. 80

Hence, option (D) is correct.