**Answer Script**

| Question No. 01 |
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| Consider the following sets  U = {1,2,3,4,5,6,7,8,9,10,11,12,13}  A= {1,2,3,4,7}  B = {3,4,5,6}  Find the set ()’ |
| Answer No. 01 |
| Given that,  A = {1, 2, 3, 4, 7}  B = {3, 4, 5, 6}  So,  (A U B) = {1, 2, 3, 4, 5, 6, 7}  Again,  (A U B)’ = U - (A U B)  = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13} - {1, 2, 3, 4, 5, 6, 7}  = {8, 9, 10, 11, 12, 13}  **Answer:** (A U B)’ = {8, 9, 10, 11, 12, 13} |

| Question No. 02 |
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| Find the GCD and LCM of 77 and 121. Write the process in details |
| Answer No. 02 |
| gcd (121, 77)  = gcd (77, 44)  = gcd (44, 33)  = gcd (33, 11)  = gcd (11, 0)  = 11  So, GCD is 11  Now, (77 \*121) = 9317  We know that, GCD \* LCM = 77 \* 121 = 9317  So, LCM = (9317 / GCD) = 847  **Answer:** GCD = 11, LCM = 847 |

| Question No. 03 |
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| In a cricket match, you have a squad of 15 players and you need to select 11 for a game. The two opening batsmans are fixed and the rest of the players are flexible. How many batting orders are possible for the game? |
| Answer No. 03 |
| We can select 11 players from a squad of 15 players in = 15C11 ways  = ways  = ways  = 1365 ways  Given that, two opening batsmen are fixed. So, the batting orders will be arranged with the remaining 9 players.  So, 9 players can be arranged in = 9! ways  = 362880 ways  So, there are total ways of batting orders are = 1365 \* 362880  = 495331200  **Answer:** 495331200 numbers of batting orders are possible. |

| Question No. 04 |
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| If the radius of both of the green circles is 10 cm, find the area of the yellow region (outside of the circles but inside the rectangle) |
| Answer No. 04 |
| Given that, Radius = 10 cm  So, Diameter = 2\*10 cm = 20 cm  In this region summation of the diameters of both circles is equal to the length of the rectangle. Here, also the diameter of one circle is equal to the width of the rectangle.  So, the area of the rectangle is = width \* length = {20 \* (2 \* 20)} cm = 800 cm  Again the of one circle is = 3.1416 \* radius2 = 3.1416 \* (10)2 = 314.16  So, the summation of both circles is = 2 \* 314.16 = 628.32 cm  So, the area of the yellow region = area of rectangle - area of both circles  = 800 cm - 628.32 cm  = 171.68 cm  **Answer:** The area of the yellow region is 171.68 cm |

| Question No. 05 |
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| Find the 100-th term of the following sequence  3, 10, 17, 24, …  Also find the sum of the first 100 terms. |
| Answer No. 05 |
| Here,  first number = a = 3  Difference = d = 10 -3 = 17 - 10 = 24 - 17 = 7  n-th term of the following sequence = a + (n - 1) \* d  100-th term of the following sequence = 3 + (100 - 1) \* 7  = 3 + 99 \* 7  = 3 + 693  = 696  Sum of the first n terms =  Sum of the first 100 terms =  = 50 (6 + 99 \* 7)  = 50 (6 + 693)  = 50 \* 699  = 34950  **Answer:** 100-th term of the following sequence = 696  Sum of the first 100 terms = 34950 |

| Question No. 06 |
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| Two taps, T1 and T2 can fill an empty tank in 20 minutes and 15 minutes, respectively. They both were turned on to fill the tank, but tap T1 was turned off after some time, and tap T2 took 10 minutes to fill the tank. Find out after how much time tap T1 was turned off? |
| Answer No. 06 |
| Here, T1 can fill in 20 minutes = 1 tank  So, T1 can fill in 1 minute = tank  Again T2 can fill in 15 minutes = 1 tank  So, T2 can fill in 1 minute = tank  So, T2 can fill in 10 minutes = tank  = tank  So, Before turning off T1 :  T1 and T2 both filled = (1 - ) tank  = tank  So, both taps can fill in 1 minute = ( + tank  = tank  tank can be filled in = 1 minute  1 tank can be filled in = minute  = minutes  tank can be filled in = \* ) minutes  = minutes  So, after minutes tap T1 was turned off.  **Answer:** minutes |

| Question No. 07 |
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| Your friend deposited 10,500 BDT in a bank and received 12,150 BDT in total after 3 years.  You deposited 15,100 BDT in another bank and received 18,755 BDT in total after 5 years.  Considering simple interest, which one of you went to the bank with a higher interest rate? |
| Answer No. 07 |
| In case of my friend:  Capital, P = 10,500  Time unit, n = 3  Interest, I = 12150 - 10500 = 1650  Simple interest rate, r = ?  We know, I = P \* n \* r  So, r = I / (P \* n)  = 1650 / (10500 \* 3)  = 0.052 \* 100%  = 5.23%  In case of mine:  Capital, P = 15100  Time unit, n = 5  Interest, I = 18755 - 15100 = 3655  Simple interest rate, r = ?  We know, I = P \* n \* r  So, r = I / (P \* n)  = 3655 / (15100 \* 5)  = 0.048 \* 100%  = 4.84%  So, we can say that my friend went to the bank with a higher interest rate  **Answer:** My friend. |

| Question No. 08 |
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| You have two boxes, box A and box B.  In box A, there are 5 red balls and 10 green balls.  In box B, there are 3 red balls and 7 green balls.   1. If you pick a ball from box A, what is the probability that this is a red ball? 2. If you pick a ball from box B, what is the probability that this is a red ball? 3. If you pick one from A and one from B, what is the probability that both of them are red balls? |
| Answer No. 08 |
| 1. In box A, total balls = (5 + 10) = 15   Red balls = 5  So, the probability P(red ball) = 5/15 = =   1. In box B, total balls = (3 + 7) = 10   Red balls = 3  So, the probability P(red ball) =   1. If one is picked from A and another one from B, the possibility that both of them are red balls are = =   **Answer:** a)  b)  c) |

| Question No. 09 |
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| Convert the hexadecimal number denoted by *A1E7* to an octal number. |
| Answer No. 09 |
| (A1E7)16 = (1010 0001 1110 0111)2  = (001010000111100111)2  = (001 010 000 111 100 111)2  = (120747)8  **Answer:** (120747)8 |

| Question No. 10 |
| --- |
| Eight students took a test on 30 marks and got the following scores:  10, 27, 12, 18, 30, 9, 24, 28  What is the mean score and express the score in percentage. Also find the median score. |
| Answer No. 10 |
| Mean Score = (10+27+12+18+30+9+24+28) / 8  = 158 / 8  = 79 / 4  = 19.75  In percentage = (19.75 / 30) \* 100%  = 65.83%  Median :  After sorting them : 9, 10, 12, 18, 24, 27, 28, 30  Here is 8 numbers so we will take two elements in the middle and average of these  Median Score = (18 + 24) / 2  = 42 / 2  = 21  **Answer**: Mean Score = 19.75, in percentage = 65.83%, Median score = 21 |