

ভগ্নাংশ ও গণনা সরকারী ও প্রাইভেট ব্যাংকের পরীক্ষার মোটামুটি গুরুত্বপূর্ণ একটি অধ্যায়। পরীক্ষার প্রশ্নপত্রের সাথে সংগতি রেখে ও ক্লাসে পাঠদানের সুবিধা মাথায় রেখে বরাবরের মত টপিকস/ টাইপ অনুসারে নিয়ম ও সংশ্লিষ্ট সমস্যাগুলো দেওয়া হলো।

Discussed Types for MCQ :

- ✎ Smallest and Largest Value Determination
- ✎ Times Fraction
 - ✎ Reciprocal Fraction
 - ✎ Unitary Method
 - ✎ Equation and Wordy Dealings
 - ✎ Wordy Problems
 - ✎ Remaining Fraction

✎ Topic – 01 : Smallest and Largest fraction determination

01. Which of the following has the greatest value?

- (A) $\frac{2}{5}$ (B) $\frac{3}{7}$ (C) $\frac{4}{9}$ (D) $\frac{5}{11}$ (E) None

✎ Topic – 02 : Times fraction

02. $\frac{3}{8}$ of a number is what fraction of 2 times the number?

- (A) $\frac{3}{16}$ (B) $\frac{5}{6}$ (C) $\frac{3}{4}$ (D) $\frac{3}{5}$ (E) $\frac{5}{7}$

✎ Topic – 03 : Reciprocal fraction

03. The product of two numbers x & y is twice the sum of the numbers. Find the reciprocal sum of these numbers?

- (A) 2 (B) $\frac{1}{3}$ (C) $\frac{3}{4}$ (D) $\frac{1}{4}$ (E) None

✎ Topic – 04 : Unitary Method

04. Bowl S only contains marbles. If $\frac{1}{4}$ th of the marbles were removed, the bowl would be filled to $\frac{1}{2}$ of its capacity. If 100 marbles are added, the bowl would be full. How many marbles are in bowl S?

- (A) 90 (B) 300 (C) 400 (D) 100 (E) None

05. Jane gave $\frac{2}{5}$ th of the amount she had to Jack. Now she had \$300. How much she gave to Jack?

- (A) 200 (B) 300 (C) 400 (D) 100 (E) 200

Topic - 05 : Equation Dealing

06. If $\frac{2}{3}$ of the number of women attending a certain art competition is equal to $\frac{1}{2}$ the number of men attending, what fraction of those attending is women?
- (A) $\frac{2}{5}$ (B) $\frac{3}{7}$ (C) $\frac{5}{7}$ (D) $\frac{3}{4}$ (E) None
07. $\frac{1}{4}$ of Ahsan's money is equal to $\frac{1}{6}$ of Babu's money. If both together have Tk 600, what is the difference between their amounts?
- (A) 50 (B) 120 (C) 240 (D) 360 (E) 180

Topic - 06 : Wordy Problem

08. Suppose $x = \frac{1}{3}y$, $y = \frac{1}{3}r$ And $r = \frac{3}{4}s$, what would be the value of y as fraction of s?
- (A) $\frac{1}{2}$ (B) $\frac{2}{3}$ (C) $\frac{3}{4}$ (D) $\frac{1}{4}$ (E) $\frac{1}{3}$
09. Jar - A has the twice the capacity of Jar - B. Jar - A and Jar -B both are 50% full of water. If $\frac{1}{2}$ the water of Jar -B purred into Jar -A, then Jar -A will filled what fraction of capacity?
- (A) $\frac{1}{2}$ (B) $\frac{5}{8}$ (C) $\frac{3}{4}$ (D) $\frac{7}{8}$ (E) None

Topic - 07 : Remaining Fraction

10. Shanta spent $\frac{1}{3}$ of her amount for books and $\frac{3}{4}$ th of the remaining for apparatus. What fraction amount she left?
- (A) $\frac{1}{2}$ (B) $\frac{5}{8}$ (C) $\frac{3}{4}$ (D) $\frac{7}{8}$ (E) None

শতকরা (Percents) ব্যাংক জব রিক্রুটমেন্টের জন্য ভীষণ গুরুত্বপূর্ণ একটি অধ্যায়। প্রায় সকল ব্যাংকে ৩০ মার্কসের মোট এমসিকিউ তে ৩/৪ টি এবং ২০-২৫ মার্কসের পরীক্ষায় ২/৩ টি প্রশ্ন আসে। ক্লাসে এমসিকিউ ফরম্যাটে পড়ানোর সুবিধার্থে টপিকস ক্লাসিফাইড করা হলো। টিচার চাইলে এমসিকিউ এর জন্য শর্ট-কাট নিয়ম শেখাতে পারবেন। তবে তার আগে অবশ্যই মূল নিয়ম শেখাবেন। কোন অবস্থাতেই মূল নিয়ম বাদে শর্টকাট শেখাবেন না।

Discussed Types:

- ✎ Basic Rules
- ✎ Definition of Percent
- ✎ Unitary Method
- ✎ Successive Rules
- ✎ Reverse Percent

✎ Topic – 01 : Basic Rules

11. What percent of 50 is 1.5?
 (A) 3 (B) 0.3 (C) 0.03 (D) 30 (E) None
12. If 15% of a number is 4.5, then 55% of the same number is -
 (A) 1.5 (B) 9.5 (C) 16.5 (D) 15 (E) None

✎ Topic – 02 : Definition of Percent

13. In a month, a salesperson sold 15 generators. A new sales promotion came out next month and he sold 21 generators that month. What was the percent increase in sales?
 (A) 45% (B) 49% (C) 38% (D) 46% (E) 40%
14. Of the 3600 employees of a company X, $\frac{1}{3}$ are clerical, If the clerical staff were to be reduced by $\frac{1}{3}$, What percents of the total number of remaining employees would be clerical?
 (A) 25% (B) 22.2% (C) 20% (D) 12.5% (E) 11.1%

✎ Topic – 03 : Unitary Method

15. In a class, 34% of the students are female. Given that there are 16 more male than female, How many female students are there in the class.
 (A) 17 (B) 32 (C) 34 (D) 42 (E) None
16. 20% of the computer technician have passed the certification test conducted by BCS. Among the technician who have not passed the test, 21 have taken the preparatory course and 15 haven't taken the course. How many computer technicians are there?
 (A) 17 (B) 32 (C) 36 (D) 45 (E) 80

17. Mr. Ahsan is insured completely for Tk 50,000 of damages to his car. For any damage above Tk 50,000, the insurance company will pay Tk 50,000 plus 20% of the rest of the damage amount. For a recent accident, Mr. Ahsan was paid Tk 56,000 by the insurance company. What was the total amount of the damage estimated?
- (A) Tk 30,000 (B) Tk 2,80,000 (C) Tk 1,04,000 (D) Tk 80,000 (E) Tk 86,000
18. At an election involving two candidates, 68 votes were declared invalid. The winning candidate secures 52% and wins by 98 votes. The total number of votes polled is:
- (A) 2382 (B) 2450 (C) 2518 (D) 2323 (E) None

Topic – 04 : Successive Rules

19. According to current budget price of a certain brand of cigarette has increased by 20% and consumption reduced by 20%. What is the effect on market?
- (A) 4% increase (B) 4% reduce (C) 6% increase (D) No change (E) None
20. Successive discount of 20% and x% are equal to a single discount of 40%. Then x =?
- (A) 20 (B) 25 (C) 30 (D) 35 (E) 40
21. Due to Ramadan market price of sugar has increased by 20% latter it is projected that it will be reduced by 20%. If the price of per kg sugar was Tk 75 before Eid, What was the projected price of per kg sugar after Eid?
- (A) 90 (B) 85 (C) 72 (D) 67 (E) None

Topic – 05 : Reverse Rules

22. If A's income is 25% less than that of B, then how much percent is B's income more than that of A?
- (A) $33\frac{1}{3}\%$ (B) $66\frac{2}{3}\%$ (C) $11\frac{2}{3}\%$ (D) 25% (E) None
23. If the price of petrol increases by 25% and Raju intends to spend only an additional 15% on petrol, by how much % will he reduce the quantity of petrol purchased?
- (A) 10% (B) 12% (C) 8% (D) 6.67% (E) Cannot be determined
23. Mohona has appointed a baby sitter for 40Hrs a week from an Apps service. The rate of that service has increased by 25%. How many hours per week has Mohona needed a baby sitter if she doesn't change the wage?
- (A) 10 (B) 12 (C) 12 (D) 16 (E) Cannot be determined

অনুপাত-সমানুপাত ও মিশ্রন সরকারী কিংবা প্রাইভেট যেকোন ব্যাংকের পরীক্ষার অন্যতম গুরুত্বপূর্ণ একটি অধ্যায়। তবে মিশ্রন অধ্যায়টি কেবলমাত্র এমসিকিউর জন্য। তবে অনুপাত-সমানুপাতের সাথে মিশ্রন কে জড়িয়ে Difficulty Level Hard & Very Hard Level-এর লিখিত পরীক্ষার কিছু সমস্যা থাকে যা ভীষণ গুরুত্বপূর্ণ। পরীক্ষার প্রশ্নপত্রের সাথে সংগতি রেখে ও ক্লাসে পাঠদানের সুবিধা মাথায় রেখে বরাবরের মত টপিকস/টাইপ অনুসারে সমস্যাগুলো দেওয়া হলো।

Discussed Types :

- ✎ Common use of Ratio
- ✎ Ratio involves Unitary Method
- ✎ Ratio involves Equations
- ✎ LCM and HCF
- ✎ Successive Ratio
- ✎ Miscellaneous Rules

✎ Topic – 01 : Common use of ratio

24. The ratio of three angle of a triangle is 2 : 3 : 4 the largest angle is.

- (A) 30 (B) 50 (C) 60 (D) 70 (E) 80

✎ Topic – 02 : Ratio involved Unitary Method

25. If the ratio of boys and girls is 5:3 and there are 65 boys, how many girls are there.

- (A) 33 (B) 35 (C) 39 (D) 38 (E) None

✎ Topic – 03 : Ratio involved Equations

26. At the beginning of the year, the ratio of male & female students in a class is 3:4. During the year, 10 male & 20 female students left but no students admitted in the college. Then the ratio become 4:5. How many female students are there.

- (A) 80 (B) 90 (C) 100 (D) 120 (E) None

✎ Topic – 04 : LCM & HCF

27. Two numbers are in the ratio of 5: 3. If their H.C.F. is 10, find the largest number.

- (A) 15 (B) 30 (C) 50 (D) 150 (E) None

28. If the ratio of two numbers are 3: 2. If their H.C.F. is 5, find the LCM.

- (A) 15 (B) 30 (C) 45 (D) 50 (E) None

Topic – 05 : Successive Ratio

29. If $A : B = 2 : 3$ and $B : C = 3 : 4$ then $A : C = ?$
 (A) 1 : 2 (B) 2 : 3 (C) 3 : 4 (D) 1 : 3 (E) None
30. If $A : B = 1 : 2$; $B : C = 2 : 3$ and $C : D = 3 : 4$ then $A : D = ?$
 (A) 1 : 2 (B) 1 : 3 (C) 1 : 4 (D) 2 : 3 (E) None

Topic – 06 : Miscellaneous Rules

31. Two whole numbers whose sum is 64, which of the following cannot ratio of the numbers
 (A) 5 : 3 (B) 7 : 1 (C) 3 : 4 (D) 9 : 7 (E) None
32. A recipe for 4 servings requires salt and pepper to be added in the ratio of 2 : 3. If the recipe is adjusted to make 8 servings, what is the ratio of the salt and pepper that must now be added?
 (A) 4:3 (B) 2:6 (C) 2:3 (D) 3:2 (E) None

Students' work
Ratio – Proportion (অনুপাত-সমানুপাত)

01. Two numbers are in the ratio of 15 : 11. If their H.C.F. is 13, find the numbers.
 (A) 195 and 143 (B) 190 and 143 (C) 195 and 145 (D) 195 and 145 (E) None
02. The ratio of 'w', 'x', and 'y' is 2:5: 11. If the value of 'x' is 55, what are the values of 'w' and 'y'?
 (A) 121,220 (B) 12, 121 (C) 22, 121 (D) 112, 22 (E) None
03. The ratio of three numbers is 3 : 4 : 5 and the sum of their squares is 1250. The sum of the numbers is:
 (A) 30 (B) 50 (C) 60 (D) 90 (E) 65
04. \$3660 is divided among X, Y & Z in such a way that if \$10, \$20 & \$30 are removed from the sums that X, Y & Z respectively, then the sums that they will get will be in the ratio of 3:4:5. How much did X receive?
 (A) 890 (B) 905 (C) 910 (D) 915 (E) None
05. Kamal has a collection of red, blue and green marbles. If the ratio of red to blue marbles is 5:2 and the ratio of green to blue marbles is 10:3, what is the ratio of red to green marbles?
 (A) 2:3 (B) 4:1 (C) 3:4 (D) 3:2 (E) 3:4
06. The ratio of Red to White marbel is 3:4 and white to green marble is 5:6. What is the ratio of green to red marbles?
 (A) 6:3 (B) 8:5 (C) 4:5 (D) 5:8 (E) None
07. The ratio of Red to White marble is 3:4 and white to green marble is 5:6. If there are 16 green marbles, Find the number of red marbles.
 (A) 15 (B) 10 (C) 12 (D) 1000 (E) 2000
08. The present ratio of students to teachers at a certain school is 30 to 1. If the student enrollment were to increase by 50 students and the number of teachers were to increase by 5, the ratio of students to teachers would then be 25 to 1. What is the present number of teachers?
 (A) 5 (B) 8 (C) 10 (D) 12 (E) 15
09. The number of girls in a class is 5 times the number of boys. Which of the following can not be the total number of children in the class?
 (A) 24 (B) 30 (C) 35 (D) 42 (E) None

10. A certain company that sells only cars and trucks. Reported that revenues from car sales in 1997 were down 11 Percent from 1996 and revenues from truck sales in 1997 were up 7 percent from 1996. If total revenues from car sales and truck sales in 1997 were up 1 percent from 1996, what is the ratio of revenue from car sales in 1996 to revenue from truck sales in 1996?
 (A) 1 : 2 (B) 4 : 5 (C) 1 : 1 (D) 3 : 2 (E) None
11. Two numbers A and B are such that the sum of 5% of A and 4% of B is two-third of the sum of 6% of A and 8% of B. What is the ratio of A and B?
 (A) 1:1 (B) 1:3 (C) 2 (D) 4:3 (E) None
12. Two whole numbers whose sum is 72 which cannot be in the ratio:
 (A) 5:7 (B) 3:5 (C) 3:4 (D) 4:5 (E) 4:6
13. The L.C.M of two numbers is 48. The numbers are in the ratio 2:3. The sum of the numbers is :
 (A) 28 (B) 32 (C) 40 (D) 64 (E) 65
14. In a class of 60 students, the number of boys and girls participating in the annual sports is in the ratio 3:2 respectively. The number of girls not participating in the sports is 5 more than the number of boys not participating in the sports. If the number of boys participating in the sports is 15, then how many girls are there in the class:
 (A) 20 (B) 30 (C) 25 (D) 35 (E) 38
15. Shajib takes 3 minutes to inspect a car, and Rajib takes 4 minutes to inspect a car. If they both start inspecting different cars at 8:30 AM. what would be the ratio of the number of cars inspected by Shajib and Rajib by 8:54 AM of the same day?
 (A) 1 : 3 (B) 1 : 4 (C) 3 : 4 (D) 4 : 3 (E) 7 : 4
16. A national issue was won by a vote of 9 to 6. What part of the total vote was against the issue?
 (A) $\frac{3}{8}$ (B) $\frac{2}{5}$ (C) $\frac{6}{8}$ (D) $\frac{5}{3}$ (E) $\frac{5}{4}$
17. The ratio between two numbers is 3 : 4 and their least common multiple is 180. What is the first number?
 (A) 15 (B) 20 (C) 45 (D) 60 (E) 65
18. The ratio of the sum of the reciprocals of x and y to the product of the reciprocals of x and y is 1 : 3. What is sum of the number x and y?
 (A) $\frac{1}{3}$ (B) $\frac{1}{2}$ (C) 1 (D) 2 (E) 4
19. The ratio of two numbers is 7:3 and their difference is 36. What is the larger number?
 (A) 63 (B) 66 (C) 69 (D) 55 (E) 58
20. The monthly incomes of A and B are in the ratio 4 : 5, their expenses are in the ratio 5 : 6. If 'A' saves Tk. 25 per month and 'B' saves Tk.50 per month, what are their respective incomes?
 (A) Tk.400 and Tk.500 (B) Tk.240 and Tk.300
 (C) Tk.320 and Tk.400 (D) Tk.440 and Tk.550 (E) None
21. A, B and C play cricket. A's runs are to B's runs and B's runs are to C's as 3:2. They get altogether 342 runs. How many runs did A make?
 (A) 162 (B) 108 (C) 72 (D) 74 (E) None
22. Tk.1000 is divided among A, B and C so that A has twice as much as B and B has thrice as much as C. How much did B receive?
 (A) 100 (B) 200 (C) 300 (D) 600 (E) None
23. What is the greatest number of four digits which is divisible by 15, 25, 40 and 75 ?
 A) 9800 B) 9600 C) 9400 D) 9200
24. Three numbers are in the ratio of 2 : 3 : 4 and their L.C)M. is 240. Their H.C)F. is:
 A) 40 B) 30 C) 20 D) 10

25. What is 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) 1108 B) 1683 C) 2007 D) 3363
26. Which of the following integers has the most number of divisors?
 A) 101 B) 99 C) 182 D) 176
27. The least number which should be added to 28523 so that the sum is exactly divisible by 3, 5, 7 and 8 is
 A) 41 B) 42 C) 32 D) 37
28. What is the least number which when doubled will be exactly divisible by 12, 14, 18 and 22 ?
 A) 1286 B) 1436 C) 1216 D) 1386
29. The product of two 2 digit numbers is 2028 and their HCF is 13. What are the numbers ?
 A) 26, 78 B) 39, 52 C) 13, 156 D) 36, 68
30. N is the greatest number which divides 1305, 4665 and 6905 and gives the same remainder in each case. What is the sum of the digits in N?
 A) 4 B) 3 C) 6 D) 5
31. A boy divided the numbers 7654, 8506 and 9997 by a certain largest number and he gets same remainder in each case. What is the common remainder?
 A) 156 B) 199 C) 211 D) 231
32. A, B and C start at the same time in the same direction to run around a circular stadium. A completes a round in 252 seconds, B in 308 seconds and C in 198 seconds, all starting at the same point. After what time will they again at the starting point ?
 A) 36 minutes 22 seconds B) 46 minutes 22 seconds
 C) 36 minutes 12 seconds D) 46 minutes 12 seconds
33. What is the least multiple of 7 which leaves a remainder of 4 when divided by 6, 9, 15 and 18 ?
 A) 364 B) 350 C) 343 D) 371
34. Three numbers which are co-prime to each other are such that the product of the first two is 119 and that of the last two is 391. What is the sum of the three numbers?
 A) 47 B) 43 C) 53 D) 51
35. Six bells start ringing together and ring at intervals of 4, 8, 10, 12, 15 and 20 seconds respectively. How many times will they ring together in 60 minutes ?
 A) 31 B) 15 C) 16 D) 30
36. What is the smallest number which when diminished by 12, is divisible 8, 12, 22 and 24?
 A) 276 B) 264 C) 272 D) 268

Solution**Ratio – Proportion**

01. 1st Number = $15 \times 13 = 195$; 2nd Number = $11 \times 13 = 143$ [Ans : A]
02. $W : X : Y = 2 : 5 : 11 \therefore W = \frac{2}{5} \times 55 = 22$; $Y = \frac{11}{5} \times 55 = 121$ [Ans : C]
03. Here $(3x)^2 + (4x)^2 + (5x)^2 = 1250 \Rightarrow 50x^2 = 1250$; $\Rightarrow x^2 = 25$; $\therefore x = 5$.
 $\therefore \text{Sum} = 3 \times 5 + 4 \times 5 + 5 \times 5 = 60$ [Ans : C]

04. Sum after deduction = \$ (3660 - 60) = \$ 3600
 $\therefore x - \text{received} = \frac{3}{12} \times 3600 = \$ 900 \quad \therefore x - \text{actually received} = \$ 900 + \$ 10 = \$ 910$
05. Red : Blue = 5 : 2 = 15 : 6 [Multimode by 3] & Blue: Green = 3 : 10 = 6 : 20 [Multimode by 2]
 $\therefore \text{Red : Green} = 15 : 20 = 3 : 4$
06. Red : White = 3 : 4 = 15 : 20 [Multimode by 5]
 White : Green = 5 : 6 = 20 : 24 [Multimode by 4] $\therefore \text{Green : Red} = 24 : 15 = 8 : 5$
07. Red : White = 3 : 4 = 15 : 20 [Multimode by 5] & White : Green = 5 : 6 = 20 : 24 [Multimode by 4]
 $\therefore \text{Green : Red} = 24 : 15 = 8 : 5 \quad \therefore \text{Red : Marbel} = \frac{5}{8} \times 16 = 10$
08. Let, Students = 30x; Teachers = x
 Now, $\frac{30x + 50}{x + 5} = \frac{25}{1} \Rightarrow 30x + 50 = 25x + 125 \Rightarrow 5x = 75 \quad \therefore x = 15$
09. Girls : Boys = 5 : 1.
 Only option (c) not exist because you can't divide 35 by 6. [Ans : C]
10. $x \times 12 = y \times 6 \quad \therefore x : y = 1 : 2$
11. According To Question, 5% of A + 4% of B = $\frac{2}{3}$ of (6% of A + 8% of B)
 $\Rightarrow \frac{A}{20} + \frac{B}{25} = \frac{2}{3} \left(\frac{6}{100} \times A + \frac{8}{100} \times B \right) \Rightarrow \frac{A}{20} + \frac{B}{25} = \frac{2}{3} \times \frac{6}{100} \times A + \frac{2}{3} \times \frac{8}{100} \times B$
 $\Rightarrow \frac{a}{100} = \frac{B}{75} \quad \therefore A : B = 100 : 75 = 4:3$
12. 72 is not divisible by (3 + 4) = 7 $\therefore 72 \div 7 = 10.28$
13. Let, the number = 2x, 3x. According to question
 $6x = 48. \quad x = 8 \quad \therefore \text{Sum of numbers} = 2x + 3x = 2 \times 8 + 3 \times 8 = 16 + 24 = 40$ ∴ Ans. C
14. ratio 3 হলো 15 জন, তাহলে ratio 2 = $\frac{15 \times 2}{3} = 10$
 মানে অংশগ্রহন করেছে এমন বালিকাদের সংখ্যা হলো 10 জন। তাহলে অংশগ্রহন করেনি এমন student-এর সংখ্যা = 60 - (15 + 10) = 35 জন।
 বালিকাদের সংখ্যা বালকদের চেয়ে 5 জন বেশি বলে 35 জনের মধ্যে বালক হবে 15 জন এবং বালিকা হবে 20 জন।
 $\therefore \text{Total girls-এর সংখ্যা হবে } (10 + 20) = 30 \text{ জন}$
15. মোট সময় = (8.54 - 8.30) = 25 minute
 Shajib 3 minute এ car inspect করে 1 টি
 $\therefore \text{“ 1 “ “ “ “ “ } \frac{1}{3}$
 $\therefore \text{“ 25 “ “ “ “ “ } \frac{1}{3} \times 25 = \frac{25}{3} \text{ টি}$
 একইভাবে Rajib 25 minute এ করে = $\frac{1}{4} \times 25 = \frac{25}{4} \text{ টি}$
 $\therefore \text{Shajib এর car এর সংখ্যা : Rajib এর car এর সংখ্যা} \Rightarrow \frac{25}{3} : \frac{25}{4} \Rightarrow \frac{1}{3} : \frac{1}{4} \Rightarrow 4 : 3$ ∴ Ans. D

16. এখানে Total vote সংখ্যা $(9 + 6) = 15$ টি বিপক্ষে গিয়েছিল 6 টি vote. সুতরাং মোট ভোটের বিপক্ষে গিয়েছিল $\frac{6}{15} = \frac{2}{5}$ অংশ। \therefore Ans. B

17. দেয়া আছে, দুটি সংখ্যার ratio = 3 : 4
মনে করি, একটি সংখ্যা = $3x$; \therefore অপরটি = $4x$; \therefore ল.সা.গু = $12x$ এখানে ল.সা.গু = 180
 $\therefore 12x = 180 \Rightarrow x = \frac{180}{12} = 15$ \therefore ১ম number টি $3x = 3 \times 15 = 45$ \therefore Ans. C

18. x এবং y এর reciprocal-এর যোগফল = $\frac{1}{x} + \frac{1}{y} = \frac{y+x}{xy} = \frac{x+y}{xy}$
 x এবং y এর reciprocal-এর গুনফল = $\frac{1}{x} \times \frac{1}{y} = \frac{1}{xy}$
প্রশ্নমতে, $\frac{x+y}{xy} : \frac{1}{xy} = 1:3 \Rightarrow \frac{x+y}{xy} = \frac{1}{3} \Rightarrow \frac{x+y}{xy} \times \frac{xy}{1} = \frac{1}{3} \Rightarrow x+y = \frac{1}{3}$; \therefore Ans. A

19. মনেকরি, Number দুটি যথাক্রমে $7x$ এবং $3x$ \therefore আমরা পাই, $7x - 3x = 36 \Rightarrow 4x = 36 \Rightarrow x = 9$ $\therefore 7x = 7 \times 9 = 63$; \therefore Ans. A

20. মনেকরি A এর Income = $4x$, \therefore B এর Income = $5x$ \therefore A এর Expenditure = y , \therefore B Expenditure = $6y$
প্রশ্নমতে, $4x - 5y = 25$ (i) & $5x - 6y = 50$ (ii)
Solving I and ii, $x = 100$ \therefore A = 400, B = 500 \therefore Ans. A

21. A ও B-এর Run-এর অনুপাত = 3 : 2 এবং B ও C-এর Run-এর অনুপাত = 3 : 2
অর্থাৎ, $\frac{A}{B} = \frac{3}{2}$; $B = \frac{2}{3}A$; অথবা, $\frac{B}{C} = \frac{3}{2}$; $C = \frac{2}{3}B$ $\therefore C = \frac{2}{3} \cdot \frac{2}{3}A \Rightarrow C = \frac{4}{9}A$;
এখন, $A + B + C = 342 \Rightarrow A + \frac{2}{3}A + \frac{4}{9}A = 342 \Rightarrow A \left(\frac{9+6+4}{9} \right) = 342; \Rightarrow A = \frac{342 \times 9}{19} = 162$ \therefore Ans. A

22. এখানে, $A = 2B$ আবার, $B = 3C \Rightarrow 3C = B \Rightarrow C = \frac{B}{3}$
প্রশ্নমতে, $A + B + C = 1000 \Rightarrow 2B + B + \frac{B}{3} = 1000 \Rightarrow \frac{6B + 3B + B}{3} = 1000 \Rightarrow 10B = 3000 \Rightarrow B = \frac{3000}{10} = 300$ \therefore Ans. C

23. Greatest number of four digits = 9999
LCM of 15, 25, 40 and 75 = 600
 $9999 \div 600 = 16$, remainder = 399
Hence, greatest number of four digits which is divisible by 15, 25, 40 and 75
= $9999 - 399 = 9600$ **Answer: B**

24. Let the numbers be $2 \times 2x$, $3 \times 3x$ and $4 \times 4x$
LCM of $2 \times 2x$, $3 \times 3x$ and $4 \times 4x = 12 \times 12x$
 $12x = 240 \Rightarrow x = \frac{240}{12} = 20$
H.C.F of $2x$, $3x$ and $4x = x = 20$ **Answer: C**

25. LCM of 5, 6, 7 and 8 = 840
 Hence the number can be written in the form $(840k + 3)$ which is divisible by 9.
 If $k = 1$, number = $(840 \times 1) + 3 = 843$ which is not divisible by 9.
 If $k = 2$, number = $(840 \times 2) + 3 = 1683$ which is divisible by 9.
 Hence 1683 is the least number which when divided by 5, 6, 7 and 8 leaves a remainder 3, but when divided by 9 leaves no remainder. **Answer: B**
26. $99 = 1 \times 3 \times 3 \times 11 \Rightarrow$ Divisors of 99 are 1, 3, 11, 9, 33 and 99
 $101 = 1 \times 101 \Rightarrow$ Divisors of 101 are 1 and 101
 $182 = 1 \times 2 \times 7 \times 13 \Rightarrow$ Divisors of 182 are 1, 2, 7, 13, 14, 26, 91 and 182
 $176 = 1 \times 2 \times 2 \times 2 \times 2 \times 11 \Rightarrow$ Divisors of 176 are 1, 2, 11, 4, 22, 8, 44, 16, 88, 176
 Hence 176 has most number of divisors. **Answer: D**
27. LCM of 3, 5, 7 and 8 = 840
 $28523 \div 840 = 33$ remainder = 803
 Hence the least number which should be added = $840 - 803 = 37$ **Answer: D**
28. LCM of 12, 14, 18 and 22 = 2772
 Hence the least number which will be exactly divisible by 12, 14, 18 and 22 = 2772
 $2772 \div 2 = 1386$
 1386 is the number which when doubled, we get 2772
 Hence, 1386 is the least number which when doubled will be exactly divisible by 12, 14, 18 and 22. **Answer: D**
29. Let the numbers be $13x$ and $13y$ (\because HCF of the numbers = 13)
 $13x \times 13y = 2028 \Rightarrow xy = 12$
 co-primes with product 12 are (1, 12) and (3, 4)
 (\because we need to take only co-primes with product 12.
 If we take two numbers with product 12, but not co-prime, the HCF will not remain as 13)
 (Reference: Co-prime Numbers)
 Hence the numbers with HCF 13 and product 2028 = $(13 \times 1, 13 \times 12)$ & $(13 \times 3, 13 \times 4) = (13, 156)$ & $(39, 52)$
 Given that the numbers are 2 digit numbers.
 Hence numbers are 39 and 52 **Answer: B**
30. If the remainder is same in each case and remainder is not given,
 HCF of the differences of the numbers is the required greatest number.
 $6905 - 1305 = 5600$
 $6905 - 4665 = 2240$
 $4665 - 1305 = 3360$
 Hence, the greatest number which divides 1305, 4665 and 6905 and gives the same remainder,
 $N = \text{HCF of } 5600, 2240, 3360 = 1120$
 Sum of digits in N = Sum of digits in 1120 = $1 + 1 + 2 + 0 = 4$ **Answer: A**
31. $9997 - 7654 = 2343$
 $9997 - 8506 = 1491$
 $8506 - 7654 = 852$
 Hence, the greatest number which divides 7654, 8506 and 9997 and leaves same remainder
 = HCF of 2343, 1491, 852 = 213
 Now we need to find out the common remainder.
 Take any of the given numbers from 7654, 8506 and 9997, say 7654
 $7654 \div 213 = 35$, remainder = 199 **Answer: B**

32. LCM of 252, 308 and 198 = 2772
 Hence they all will be again at the starting point after 2772 seconds.
 i.e., after 46 minutes 12 seconds. **Answer: D**
33. Required Number = $(90k + 4)$ which is a multiple of 7
 Put $k = 1$. We get number as $(90 \times 1) + 4 = 94$. But this is not a multiple of 7
 Put $k = 2$. We get number as $(90 \times 2) + 4 = 184$. But this is not a multiple of 7
 Put $k = 3$. We get number as $(90 \times 3) + 4 = 274$. But this is not a multiple of 7
 Put $k = 4$. We get number as $(90 \times 4) + 4 = 364$. This is a multiple of 7
 Hence 364 is the answer. **Answer: A**
34. Since the numbers are co-prime, their HCF = 1
 Product of first two numbers = 119
 Product of last two numbers = 391
 The middle number is common in both of these products. Hence, if we take HCF of 119 and 391, we get the common middle number.
 HCF of 119 and 391 = 17 \Rightarrow Middle Number = 17
 First number $\frac{119}{17} = 7$ Last number $\frac{319}{17} = 23$
 Sum of the three numbers = $7 + 17 + 23 = 47$ **Answer: A**
35. LCM of 4, 8, 10, 12, 15 and 20 = 120
 120 seconds = 2 minutes
 Hence all the six bells will ring together in every 2 minutes
 Hence, number of times they will ring together in 60 minutes = $1 + \frac{60}{2} = 31$ **Answer: A**
36. Required Number = $(\text{LCM of } 8, 12, 22 \text{ and } 24) + 12 = 264 + 12 = 276$ **Answer: A**

Students' work

Percentage

01. Two students appeared at an examination. One of them secured 9 marks more than the other and his marks was 56% of the sum of their marks. What are the marks obtained by them?
 A) 42, 33 B) 42, 36 C) 44, 33 D) 44, 36
02. If 20% of $a = b$, then $b\%$ of 20 is the same as:
 A) None B) 10% of a C) 4% of a D) 20% of a
03. Rahul went to a shop and bought things worth Rs. 25, out of which 30 paise went on sales tax on taxable purchases. If the tax rate was 6%, then what was the cost of the tax free items?
 A) Rs. 15 B) Rs. 12.10 C) Rs. 19.70 D) Rs. 16.80
04. In an election between two candidates, one got 55% of the total valid votes. 20% of the votes were invalid. If the total number of votes was 7500, what was the number of valid votes that the other candidate got?
 A) 2800 B) 2700 C) 2100 D) 2500
05. In a competitive examination in state A, 6% candidates got selected from the total appeared candidates. State B had an equal number of candidates appeared and 7% candidates got selected with 80 more candidates got selected than A. What was the number of candidates appeared from each state?
 A) 8200 B) 7500 C) 7000 D) 8000

06. A student has to obtain 33% of the total marks to pass. He got 125 marks and failed by 40 marks. The maximum mark is
 A) 600 B) 500 C) 400 D) 300
07. In a certain school, 20% of students are below 8 years of age. The number of students above 8 years of age is $\frac{2}{3}$ of the number of students of 8 years of age which is 48. What is the total number of students in the school?
 A) 100 B) 102 C) 110 D) 90
08. In an examination, 5% of the applicants were found ineligible and 85% of the eligible candidates belonged to the general category. If 4275 eligible candidates belonged to other categories, then how many candidates applied for the examination?
 A) 28000 B) 30000 C) 32000 D) 33000
09. A student multiplied a number by $\frac{3}{5}$ instead of $\frac{5}{3}$. What is the percentage error in the calculation?
 A) 64% B) 32% C) 34% D) 42%
10. John's salary was decreased by 50% and subsequently increased by 50%. How much percent does he loss?
 A) 35% B) 25% C) 32% D) 28%
11. The price of a car is Rs. 3,25,000. It was insured to 85% of its price. The car was damaged completely in an accident and the insurance company paid 90% of the insurance. What was the difference between the price of the car and the amount received?
 A) Rs. 76,375 B) Rs. 34,000 C) Rs. 82,150 D) Rs. 70,000
12. A housewife saved Rs. 2.50 in buying an item on sale. If she spent Rs. 25 for the item, approximately how much percent she saved in the transaction ?
 A) 9% B) 10% C) 7% D) 6%
13. A pipe X is 30 meters and 45% longer than another pipe Y. Find the length of pipe Y
 A) 20.12 B) 20.68 C) 20 D) 20.5
14. On my sister's 15th birthday, her height was 159 cm, having grown 6% since the year before. How tall was she in the previous year?
 A) 150 cm B) 140 cm C) 142 cm D) 154 cm
15. Q as a percentage of P is equal to P as a percentage of (P + Q). Find Q as a percentage of P.
 A) 62% B) 50% C) 75% D) 66%
16. Arun got 30% of the maximum marks in an examination and failed by 10 marks. However, Sujith who took the same examination got 40% of the total marks and got 15 marks more than the passing marks. What were the passing marks in the examination?
 A) 90 B) 250 C) 75 D) 85
17. 30% of the men are more than 25 years old and 80% of the men are less than or equal to 50 years old. 20% of all men play football. If 20% of the men above the age of 50 play football, what percentage of the football players are less than or equal to 50 years?
 A) 60% B) 70% C) 80% D) 90%
18. If the income tax is increased by 24%, the net income is reduced by 1%. What is the rate of Income tax.
 A) 4% B) 5% C) 6% D) 8%
19. The length of a rectangle is increased by 40%. By which % should the width be decreased to maintain the same area?
 A) 20% B) 26.66% C) $28\frac{4}{7}\%$ D) 25%

20. A sum is divided between A & B in the ratio of 1:2. A purchased a car from his part which depreciates $14\frac{2}{7}\%$ per annum & B deposited his amount in a bank, which pays him 20% Interest per annum compounded annually. By what % will the total sum of money increase after 2 years due to this investment pattern (approximately).
 A) 20% B) 26.66% C) 30% D) 25%

Solution

Percentage

- Let the marks secured by them be x and $(x + 9)$
 sum of their marks = $x + (x + 9) = 2x + 9$
 Given that $(x + 9)$ was 56% of the sum of their marks. $\Rightarrow (x + 9) = \frac{56}{100} (2x + 9)$
 $\Rightarrow (x + 9) = \frac{14}{25} (2x + 9) \Rightarrow 25x + 225 = 28x + 126 \Rightarrow 3x = 99 \Rightarrow x = 33$
 Then $(x + 9) = 33 + 9 = 42$ Hence their marks are 33 and 42 **Answer: Option A**
- 20% of $a = b \Rightarrow b = \frac{20a}{100} = \frac{a}{5}$ $b\%$ of 20 = $20 \times \frac{b}{100} = \frac{b}{5} = \frac{a}{5} \times \frac{1}{5} = \frac{a}{25} = \frac{4a}{100} = 4\%$ of a **Answer: Option C**
- Total cost of the items he purchased = Rs. 25 & Total tax incurred = 30 paise = Rs. $\frac{30}{100}$
 Let the cost of the tax free items = x & Given that tax rate = 6%
 $\therefore (25 - \frac{30}{100} - x) \frac{6}{100} = \frac{30}{100} \Rightarrow 6(25 - 0.3 - x) = 30 \Rightarrow (25 - 0.3 - x) = 5$
 $\Rightarrow x = 25 - 0.3 - 5 = 19.7$ **Answer: Option C**
- Total number votes = 7500; 20% votes were invalid.
 Therefore, 80% votes were valid. i.e., total valid votes = $7500 \times \frac{80}{100}$
 1st candidate got 55% of the total valid votes. Hence 2nd candidate go 45% of the total valid votes
 Therefore, valid votes that the 2nd candidate go
 $= 7500 \times \frac{80}{100} \times \frac{45}{100} = 75 \times \frac{4}{5} \times 45 = 75 \times 4 \times 9 = 300 \times 9 = 2700$ **Answer: Option B**
- Equal number of candidates appeared in each state.
 In state A. 6% candidates got selected. & In state B. 7% candidates got selected.
 Given the 80 more candidates got elected in state B than A.
 Therefore, 1% of candidates appeared in each state = 80
 $\Rightarrow 100\%$ of candidates appeared in each state = $80 \times 100 = 8000$
 i.e. number of candidates appeared from each state = 8000 **Answer: Option D**
- The student got 125 marks and still failed by 40 marks.
 \Rightarrow mark required to pass = $125 + 40 = 165$
 Therefore, 33% of the total marks = 165 $\Rightarrow 100\%$ of the total marks = $\frac{165 \times 100}{33} = 500$
 i.e., maximum mark = 500 **Answer: Option B**

7. Let the total number of students = x

20% of students are below 8 years of age \Rightarrow number of students whose age \geq 8 years = 80% of x (1)

number of students whose age is 8 years = 48 (2)

number of students whose age is greater than 8 years = $48 \times \frac{2}{3} = 32$ (3)

From (1), (2) and (3),

$$80\% \text{ of } x = 48 + 32 = 80 \Rightarrow 100\% \text{ of } x = \frac{80 \times 100}{80} = 100 \Rightarrow x = 100$$

Answer: Option A

8. 85% of the eligible candidates belonged to general category.

Therefore remaining 15% belonged to other categories. \Rightarrow 15% of eligible candidates = 4275

$$\Rightarrow \text{eligible candidates} = \frac{4275 \times 100}{15} = 28500$$

5% of the applicants were ineligible.

Therefore, remaining 95% were eligible. \Rightarrow 95% of applicants = 28500

$$\Rightarrow \text{number of applicants} = \frac{28500 \times 100}{95} = 30000$$

Answer: Option B

9. Let the number = 1

Then, ideally he should have multiplied: by $\frac{5}{3}$ Hence the correct result = $1 \times \frac{5}{3} = \frac{5}{3}$

By mistake, he multiplied 1 by $\frac{3}{5}$ Hence the result with the error = $1 \times \frac{3}{5} = \frac{3}{5}$

$$\text{Error} = \frac{5}{3} - \frac{3}{5} = \frac{25 - 9}{15} = \frac{16}{15}$$

$$\therefore \text{Percentage error} = \frac{\text{Error}}{\text{True Value}} \times 100 = \frac{\left(\frac{16}{15}\right)}{\left(\frac{5}{3}\right)} \times 100 = \frac{16 \times 3 \times 100}{15 \times 5} = \frac{16 \times 100}{5 \times 5} = 16 \times 4 = 64\% \quad \text{Ans: A}$$

10. Let John's initial salary = Rs. 100

After decreasing by 50%, John's salary = Rs. 50 (because it will become half)

After subsequently increasing by 50%, John's salary

$$= 50 \times \frac{100 + 50}{100} = 50 \times \frac{150}{100} = \text{Rs. } 75$$

$$\text{Loss} = 100 - 75 = \text{Rs. } 25 \quad \therefore \text{Loss percent} = \frac{25}{100} \times 100 = 25\%$$

Answer: Option B

11. Price of the car = Rs. 3,25,000 & Car was insured to 85%

Insured price = $325000 \times \frac{85}{100}$ & Insurance company paid 90% of the insurance.

$$\text{Amount paid by insurance company} = 325000 \times \frac{85}{100} \times \frac{90}{100} = 325 \times 85 \times 9 = 248025$$

Difference between the price of the car and the amount received = $325000 - 248025 = \text{Rs. } 76375$

Answer: Option A

12. Actual price = Rs. 25 + Rs. 2.50 = Rs. 27.5 & Saving = Rs. 2.5

$$\text{Saving percent} = \frac{2.5}{27.5} \times 100 = \frac{250}{275} = \frac{2500}{2750} = \frac{100}{11} = 9 \frac{1}{11} \% = 9\%$$

Answer: Option A

13. Length of pipe X = 30 meter
 Let Length of pipe Y = y meter

pipe X is 45% longer than Y $\Rightarrow 30 = y \times \frac{145}{100} \Rightarrow y = \frac{30 \times 100}{145} = \frac{6 \times 100}{29} = \frac{600}{29} = 20.68$ **Answer: Option B**

14. Given that height on 15th birthday = 159 cm. & growth = 6%
 Let height in the previous year = x

Then height on 15th birthday = $x \times \frac{106}{100} \times \frac{106}{100} = 159 \Rightarrow x = \frac{159 \times 100}{106} \Rightarrow 1.5 \times 100 = 150$ cm

Answer: Option A

15. Given that $\frac{Q}{P} = \frac{P}{P+Q}$ (1)

Since Q can be written as a certain percentage of P, we can assume that $Q = kP$

Hence (1) becomes $\frac{kP}{P} = \frac{P}{P+kP} \Rightarrow k = \frac{1}{1+k} \Rightarrow k(k+1) = 1$.. (2)

Q as a percentage of P = $\frac{Q}{P} \times 100 = \frac{kP}{P} \times 100 = 100k\%$ (3)

From here we have two approaches.

Answer: Option A

16. Let maximum marks of the examination = x & Marks that Arun got = 30% of x = $\frac{30x}{100}$

Given that Arun failed by 10 marks. So, Minimum pass mark = $\frac{30x}{100} + 10$(i)

Marks that Sujith got = 40% of x = $\frac{40x}{100}$ So, Minimum pass mark = $\frac{40x}{100} - 15$(ii)

From (1) and (2),

$\frac{30x}{100} + 10 = \frac{40x}{100} - 15 \Rightarrow \frac{10x}{100} = 25 \Rightarrow \frac{x}{10} = 25$ So, $x = 10 \times 25 = 250$

Now, Pass mark = $\frac{30x}{100} + 10 = \frac{30 \times 250}{100} + 10 = 75 + 10 = 85$

Answer: Option D

17. Let total number of men = 100
 Then, 20 men play football & 80 men are less than or equal to 50 years old.
 Remaining 20 men above 50 years old.

Number of football players above 50 years old = $20 \times \frac{20}{100}$

Number of football players less than or equal to 50 years old

Required percentage = $\frac{16}{20} \times 100 = 80\%$

Answer: Option C

18. Let, Income = 100x & Income tax = t%
 \therefore Income tax amount = t% of 100x = xt \therefore Net income = (100x - xt)

ATP, 24% of xt = 1% of (100x - xt) $\Rightarrow 24xt = 100x - xt \Rightarrow 25xt = 100x \Rightarrow t = \frac{100}{25} = 4$

\therefore % of Income tax = $\frac{xt}{100x} \times 100 = \frac{4x}{100x} \times 100 = 4\%$

Answer: Option A

19. Let, the length = $10x$ & width = $10y$

\therefore Area = $100xy$

New length = $14x$ \therefore New width = $\frac{100xy}{14x} = \frac{100y}{14}$ \therefore Decrease in width = $10y - \frac{100y}{14} = \frac{20y}{7}$

\therefore Required percentage = $\frac{\frac{20y}{7}}{10y} \times 100 = \frac{200}{7} \% = 28\frac{4}{7} \%$

20. Let, Total sum be Tk. $300x$.

So, A gets = $300x \times \frac{1}{3} = 100x$ & B gets = $(300x \times \frac{2}{3}) = 200x$

\therefore value of A's car = $100x$

Car's depreciation percentage = $14\frac{2}{7} \% = \frac{100}{7} \%$

\therefore value of car after 2 years = $100x \left(1 - \frac{100}{7 \times 100}\right)^2 = 100x \left(1 - \frac{1}{7}\right)^2 = 100x \times \frac{6}{7} \times \frac{6}{7} \approx 73x$

For 20% Interest, B's Amount after 2 years = $200x \left(1 - \frac{100}{20 \times 100}\right)^2 = 288x$

\therefore Required percentage = $\left\{ \frac{(288x + 73x) - 300x}{300x} \right\} \times 100 = \frac{61 \times 100}{300} \approx 20\%$

Answer: Option A

Student's work

Fraction & Decimal

01. The fractional expression of 0.40 is-

- (A) $\frac{2}{4}$ (B) $\frac{3}{5}$ (C) $\frac{2}{5}$ (D) $\frac{1}{4}$ (E) None of these

02. Of the following fractions, which one is less than $\frac{2}{3}$?

- (A) $\frac{7}{8}$ (B) $\frac{5}{6}$ (C) $\frac{3}{4}$ (D) $\frac{3}{5}$ (E) $\frac{5}{7}$

03. For which of the following expression would the value be greater if 160 were replaced by 120?

- I. $1000-160$ II. $\frac{160}{1+160}$ III. $\frac{1}{1-\frac{1}{160}}$

- (A) I only (B) II only (C) III only (D) I and II Only (E) I and III only

04. One-fifth of a number is equal to $\frac{3}{8}$ th of another number. The difference of the two numbers is 21. What is the smaller number?

- (A) 24 (B) 27 (C) 32 (D) 42 (E) 25

05. Four fifth of a number is 12 more than the two third of the number. The number is -

- (A) 55 (B) 65 (C) 90 (D) 80 (E) None of these

06. Which of the following fractions is a result of the sum of an integer and its reciprocal?

- (A) $\frac{15}{8}$ (B) $\frac{17}{5}$ (C) $\frac{36}{7}$ (D) $\frac{37}{5}$ (E) $\frac{65}{8}$

07. Shelly gave three-fifths of the amount of money she had to Jhorna. Shelly now has Tk. 200. How much did she give to Jhorna?
 (A) Tk. 80 (B) Tk. 120 (C) Tk. 200 (D) Tk. 300 (E) Tk. 500
08. A certain amount is distributed among A, B and C. A gets $\frac{3}{10}$ and B gets $\frac{1}{4}$ of the whole amount. If C gets Tk. 81, then B gets:
 (A) Tk.30 (B) Tk.32 (C) Tk. 36 (D) Tk. 40 (E) None of these
09. The number 3.0-1.5 is how many times of the number of 11.0-10.5 ?
 (A) 0.5 (B) 1.4 (C) 2.5 (D) 3.0 (E) None
10. Together, Andrea and Brian weigh p pounds. Brian weighs 10 pounds more than Andrea. Brain and Andrea's dog, Cubby, weighs $p/4$ pounds more than Andrea. In terms of p , what is Cubby's weight in pounds ?
 (A) $\frac{p}{2-10}$ (B) $\frac{3p}{4-5}$ (C) $\frac{3p}{2-5}$ (D) $\frac{5}{p-5}$ (E) None of these
11. For which of the following values of n is $\frac{100+n}{n}$ not an integer?
 (A) 1 (B) 2 (C) 3 (D) 4 (E) 5
12. If one number exceeds another number by 13 and the larger number is $\frac{2}{3}$ times the smaller number, then the smaller number is
 (A) 13 (B) 26 (C) 31 (D) 39 (E) None of these
13. Morshed has d books, which is 3 times as many as Salam and $\frac{1}{3}$ as many as Roni. How many books do the three of them have altogether, in terms of d ?
 (A) $\frac{5}{6}d$ (B) $\frac{7}{3}d$ (C) $\frac{10}{3}d$ (D) $\frac{7}{2}d$ (E) $\frac{9}{2}d$

Solutions

Fraction & Decimal

01. $0.40 = \frac{40}{100} = \frac{2}{5}$

02. বঙ্গগুণণ পদ্ধতিতে যাচাই করা যাক

$$\frac{2}{3} \times \frac{7}{8} \times 16 \quad \boxed{21} \rightarrow \frac{7}{8} \text{ বড়}$$

$$\frac{2}{3} \times \frac{5}{6} \times 12 \quad \boxed{15} \rightarrow \frac{5}{6} \text{ বড়}$$

$$\frac{2}{3} \times \frac{3}{4} \times 8 \quad \boxed{9} \rightarrow \frac{3}{4} \text{ বড়}$$

$$\frac{2}{3} \times \frac{3}{5} \times 9 \quad \boxed{10} \rightarrow \text{অর্থাৎ } \frac{2}{3} \text{ বড়}$$

03. i. $1000 - 160 = 840$ 160-এর পরিবর্তে 120 বসিয়ে; $1000 - 120 = 880$; $880 > 840$ সুতরাং (i) সত্যii. $\frac{160}{1+160} = \frac{160}{161}$; 160-এর পরিবর্তে 120 বসিয়ে; $\frac{120}{1+120} = \frac{120}{121}$; $\therefore \frac{120}{121} < \frac{160}{161}$ সুতরাং (ii) সত্য নয়।iii. $\frac{1}{1-\frac{1}{160}} = \frac{160}{159}$; 160-এর পরিবর্তে 120 বসিয়ে; $\frac{1}{1-\frac{1}{120}} = \frac{120}{119}$; $\therefore \frac{120}{119} > \frac{160}{159}$ সুতরাং (iii) সত্য

04.

$$\frac{x}{5} = \frac{3y}{8} \text{ বা, } 8x = 15y$$

$$\therefore x : y = 15 : 8$$

ধরি, $x = 15a$; $y = 8a$ সুতরাং, $15a - 8a = 21 \therefore a = 3$

$$\text{Smaller Number} = 8 \times 3 = 24$$

05. Let, The number = x

$$\frac{4x}{5} - \frac{2x}{3} = 12 \text{ বা, } \frac{2x}{15} = 12 \therefore x = 90$$

06. Option গুলো Test করা যাক,

a) $\frac{15}{8} \rightarrow 8 + \frac{1}{8} = \frac{65}{8} \neq \frac{15}{8}$ Here 8 integer.

b) $\frac{17}{5} \rightarrow 5 + \frac{1}{5} = \frac{26}{5} \neq \frac{17}{5}$ Here 5 integer.

c) $\frac{36}{7} \rightarrow 7 + \frac{1}{7} = \frac{50}{7} \neq \frac{36}{7}$ Here 7 integer.

d) $\frac{37}{5} \rightarrow 5 + \frac{1}{5} = \frac{26}{5} \neq \frac{37}{5}$ Here 5 integer.

e) $\frac{65}{8} \rightarrow 8 + \frac{1}{8} = \frac{65}{8} \neq \frac{65}{8}$ Here 8 integer.

07. যেহেতু শেলী বার্গাকে ৫ ভাগের ৩ ভাগ দিয়েছে তাই তার কাছে ২ ভাগ রয়েছে।

$$2 \text{ pasts} \equiv 200 \text{ tk.}$$

$$\therefore 1 \text{ pasts} \equiv \frac{200}{2} = 100 \text{ tk.}$$

$$\therefore 3 \text{ pasts} \equiv 100 \times 300 \text{ tk.}$$

08. Let, total Amount = x

$$C \text{ gets} = x - \frac{3x}{10} - \frac{x}{4} = \left(\frac{20-6-5}{20}\right) x = \frac{x}{20}$$

$$\text{So, } \frac{9x}{20} = 81 \text{ Or, } x = \frac{81 \times 20}{9} = 180$$

$$\therefore B \text{ gets} = \frac{1}{4} \times 180 = 48$$

09. $\frac{3.0-1.5}{11.0-10.5} = \frac{1.5}{0.5} = 3.0$

10. মনে করি, Andrea's weight = A,
 Brian's weight = B Ges Cubby's weight = C
 \therefore প্রশ্নমতে, $A + B = P$ ----- (i);
 $B = A + 10$ ----- (ii)
 এবং $C = A + \frac{P}{4}$ ----- (iii)
 \therefore i থেকে পাই, $A + A + 10 = P$
 $\Rightarrow 2A = P - 10$ বা, $A = \frac{P - 10}{2}$
 এখন, এই A'i মান (iii) নং সমীকরণে বসিয়ে পাই,
 $C = \frac{P - 10}{2} + \frac{P}{4} = \frac{2P - 20 + P}{4}$
 $= \frac{3P - 20}{4} = \frac{3P}{4} - \frac{20}{4} = \left(\frac{3P}{4} - 5\right)$

11. বলা হয়েছে n এর কোন মানের জন্য $\frac{100 + n}{n}$ একটি integer
 বা পূর্ণ সংখ্যা হবে না।

(A) n এর মান 1 নিলে $\frac{100 + n}{n} = \frac{100 + 1}{1} = 101$ হয়। যা

একটি পূর্ণ সংখ্যা।

(B) n এর মান 2 নিলে $\frac{100 + 2}{2} = \frac{102}{2} = 51$ একটি পূর্ণ সংখ্যা।

(C) n এর মান 3 নিলে $\frac{100 + 3}{3} = \frac{103}{3} = 34.33$

সুতরাং এটি c integer নয়।

12. (B) প্রশ্নের প্রথম অংশটুকুর মানে হলো একটি number আরেকটা
 থেকে ১৩ বেশি।
 ধরি, ছোটটা x তাহলে বড়টা $x + 13$;
 ২য় শর্তে বলেছে, $x + 13$, x-এর $\frac{3}{2}$ গুন
 $\therefore \frac{3}{2} \times x = x + 13 \Rightarrow \frac{3x}{2} = x + 13$
 $\Rightarrow 3x = 2x + 26 \Rightarrow 3x - 2x = 26 \Rightarrow x = 26$

13. Morshed এর আছে মোট 'd' সংখ্যক বই।

\therefore Salam এর আছে $\frac{d}{3}$ এবং Rony'র আছে 2d সংখ্যক বই।

\therefore তাদের সবার একত্রে আছে, $d + \frac{d}{3} + 2d$

$= \frac{3d + d + 6d}{3} = \frac{10d}{3}$

বিগত বছরের প্রশ্নপত্র সমাধান

২০১৯ সালের প্রশ্নপত্র সমাধান

[Sonali Bank Ltd. (Officer-FF, 08-02-2019)]

1. The length of a rectangle is 20% more than its breadth. Find the ratio of the area of the rectangle to that of the square whose side is equal to the breadth of the rectangle.

A) 8:9

B) 3:2

C) 6:5

D) 2:1

Ans. c

Solution:

Let, breadth '10x' So, length = 12x. Area = $12x \times 10x = 120x^2$

One side of the square is equal to breadth '10x' So, area of square = $(10x)^2 = 100x^2$

\therefore Ratio = $120x^2 : 100x^2 = 12:10 = 6:5$

2. The income of 'A' is 20% higher than that of 'B'. The income of 'B' is 25% less than of 'C'. What percent less is A's income from C's income?

A) 7%

B) 8%

C) 9%

D) 10%

Ans. d

Solution:

Let c's income 100 So, B's income = 75

$$A's \text{ income} = 75 \times \frac{120}{100} = 90$$

$$\text{Percentage less A to C} = \frac{100 - 90}{100} \times 100 = \frac{10}{100} \times 100 = 10\%$$

3. There are n students in a school. If r% among the students are 12 years or younger, which of the following expressions represents the number of students who are older than 12?

A) $n(1-r)$ B) $n(100-r)/100$ C) $n(1-r)/100$ D) $100(1-r)n$ **Ans. b**

Solution:

r% of the students 12 years or younger

So, $(100-r)\%$ “ 12 years older

$$\text{Now, } (100-r)\% \text{ of } n = \frac{(100-r)}{100} \times n = \frac{n(100-r)}{100}$$

4. A milkman pays tk. 6.40 per liter of milk. He adds water and sells the mixture at tk. 8 per liter. By doing this, he makes 37.5% profit. Find the proportion of water to milk received by the customers?

A) 1:12 B) 1:10 C) 1:15 D) 1:20 **Ans. b**

Solution:

For buying milk he pays = 6.40 M Tk & After selling he gets = 8 (M + W)

According to the question,

$$6.4 M \times 137.5\% = 8(M + W) \Rightarrow 6.40M \frac{137.5}{100} = 8M + 8W \Rightarrow 8.8M = 8M + 8W \Rightarrow 8W = 8.8M - 8M = 0.8M$$

$$\Rightarrow \frac{W}{M} = \frac{0.8}{8} = \frac{1}{10} \quad \text{Ratio} = 1:10$$

[Sonal Bank Ltd. (Officer (cash), 22-02-2019)]

5. In an office, 44% of the workers prefer coffee and 72% prefer tea) If each of them prefers coffee or tea and 40 like both, the total number of workers in the office is-

A) 200 B) 250 C) 240 D) 210 **Ans. B**

Solution:

$$\text{Both} = 72\% + 44\% - 100\% = 16\% \quad \therefore 16\% = 40 \quad \text{so, } 100\% = \frac{40}{16} \times 100 = 250$$

6. 100 kg of solution A is mixed with 60kg of solution B) If solution A has tin and copper in the ratio 1:4 and solution B has lead and tin in the ratio 3:2, then what is the amount of tin in the new solution?

A) 70kg B) 36kg C) 44kg D) 56kg **Ans. C**

Solution:

$$\text{Solution A, tin: Copper} = 1 : 4 \quad \therefore \text{tin} = 100 \times \frac{1}{5} = 20\text{kg}, \quad \text{Copper} = 100 \times \frac{4}{5} = 80\text{kg}$$

$$\text{Solution B, lead: tin} = 3 : 2 \quad \therefore \text{lead} = 60 \times \frac{3}{5} = 36 \text{ kg} \quad \text{tin} = 60 \times \frac{2}{5} = 24 \text{ kg} \quad \therefore \text{total tin} = 20 + 24 = 44 \text{ kg}$$

7. A jar contains a mixture of oil and water in the ratio 22:3. 50 litres of the mixture was taken out and 25 litres of water was added to it. If water was 34% in the resultant mixture, what was the initial quantity of the mixture (in litres) in the jar?

A) 175 B) 150 C) 75 D) 125 **Ans. D**

Solution:

Total mixture = $22x + 3x = 25x$ \therefore New total mixture = $25x - 50 + 25 = 25x - 25 = 25(x - 1)$

New total water = $3x - 50 \times \frac{3}{25} + 25 = 3x + 19$

ATQ, $25(x - 1) \times \frac{34}{100} = 3x + 19 \Rightarrow 34x - 34 = 12x + 76 \Rightarrow 22x = 110 \therefore x = 5$

\therefore Total mixture = $25 \times 5 = 125$ litre

8. The ratio of the length to the breadth of a rectangular park is 3:2, if a man cycling along the boundary of the park at the speed of 12 km/hr completes one round in 8 minutes, then what is the area of the park?
A) 153600m² B) 15400m² C) 307400m² D) None **Ans. A**

Solution:

Let, Length = $3x$, breadth = $2x$

Speed = 12 km/hr = $12 \times \frac{5}{18}$ m/s = $\frac{10}{3}$ m/s \therefore time = 8 min = $8 \times 60 = 480$ sec

Perimeter = $\frac{10}{3} \times 480 = 1600$ m i.e $2(2x + 3x) = 1600 \Rightarrow 5x = 800 \therefore x = 160$ m

length = $3 \times 160 = 480$ m, breadth = $2 \times 160 = 320$ m \therefore area = $480 \times 320 = 153600$ m²

9. Given that, 24 carat gold is pure gold, 18 carat gold is $\frac{3}{4}$ th of pure gold and 20 carat gold is $\frac{5}{6}$ th of pure gold, the ratio of the pure gold in 18 carat gold to the pure gold in 20 carat gold is-
A) 5:8 B) 10:9 C) 8:5 D) 9:10 **Ans. D**

Solution:

Let, the 24 carat pure gold be 'x'

" 18 " " gold be $\frac{3x}{4}$

" 20 " " gold be $\frac{5x}{6}$

Ratio = $\frac{3x}{4} : \frac{5x}{6} = \frac{3x}{4} \times 12 : \frac{5x}{6} \times 12 = 9x : 10x = 9:10$

10. On reducing the entry fee by 35% in a park, the number of people coming to the park increased by 40%, then the percent increase or decrease in the income form the entry fee is-
A) 9% decrease B) 7% decrease C) 9% increase D) 5% decrease **Ans. A**

Solution:

Let previous fee 100 Current fee = 65

" people 100 " People = 140

Previous Income = $100 \times 100 = 10,000$ \therefore current income = $65 \times 140 = 9100$

Percentage = $\frac{(9100-10,000)}{10,000} \times 100 = -9\%$ i.e 9% decrease

IFIC Bank Ltd TSO (25-01-19)

11. 'Interest rate fall continues a further 20% drop on the old rate'. If the old interest rate is 8.75% what is the new rate?
A) 1.75% B) 5.75% C) 6.75% D) 7.0% **Ans. D**

Solution:

\therefore নতুন সুদ = $8.75 \times 80\% = \left(8.75 \times \frac{80}{100}\right)\% = 7\%$

12. A gas tank is $\frac{1}{5}$ th full and needs 32 gallons more to be $\frac{3}{7}$ th full. What is the capacity of the tank?

- A) 115 B) 120 C) 135 D) 140 Ans. D

Solution:

এখানে, $\frac{3}{7} - \frac{1}{5} = \frac{8}{35}$ অংশের পরিমাণ 32 গ্যালন। \therefore সম্পূর্ণ বা 1 অংশের পরিমাণ = $32 \times \frac{35}{8} = 140$ গ্যালন।

13. Mr. Elves spends 67% of his income on rent, 15% on clothing, 8% on food and the remaining 1,100 taka on gift. What is the monthly income?

- A) 6,000 B) 9,000 C) 10,000 D) 11,000 Ans. D

Solution: লোকটি তার আয়ের মোট ব্যয় করেন = $67\% + 15\% + 8\% = 90\%$ \therefore অবশিষ্ট থাকে = $(100 - 90)\% = 10\%$

অর্থাৎ বেতনের 10% হলো = 1,100 টাকা \therefore বেতনের 1% হলো = $\frac{1100}{100}$ টাকা

\therefore বেতনের 100% হলো = $\frac{1100 \times 100}{10} = 11,000$ টাকা

14. The present ages of Simba and Bambi are in the ratio is 6:4. Five years ago there ages were in the ratio of 5:3. How old is Simba?

- A) 30 B) 36 C) 42 D) 48 Ans. A

Solution:

বর্তমান Bambi বয়স = $6x$ এবং Simba বয়স = $4x$

প্রশ্নমতে, $\frac{6x-5}{4x-5} = \frac{5}{3} \Rightarrow 20x - 25 = 18x - 15 \Rightarrow 20x - 18x = 25 - 15 \Rightarrow 2x = 10 \therefore 2x = 10 \therefore x = 5$

\therefore বর্তমানে simba এর বয়স = $6x = 6 \times 5 = 30$ বছর।

15. Suppose IFIC bank pays 10% tax on its first 100000 taka earning and 15% on all earnings in excess of 1,00,000 taka. What will be fine amount of tax, if its earning is 2,75,000 taka?

- A) 36,250 B) 37,500 C) 35,000 D) 35,250 Ans. A

Solution

1,00,000 টাকার উপর কর দিবে = $\left(100000 \times \frac{10}{100}\right) = 10,000$ টাকা

এবং 1,75,000 টাকার উপর কর দিবে = $\left(175000 \times \frac{15}{100}\right) = 26,250$ টাকা

\therefore মোট কর দিবে = $10,000 + 26,250 = 36,250$ টাকা।

16. If the diameter of a circle increases by 50%, by what percent will the area of the circle increase?

- A) 25% B) 50% C) 100% D) 125% Ans. D

Solution:

প্রশ্নে বলা হচ্ছে যে, একটি বৃত্তের ব্যাস 50% বাড়ানো হলে এর ক্ষেত্রফল কত বাড়বে?

ধরি, বৃত্তটির ব্যাসার্ধ r মিটার; ক্ষেত্রফল = πr^2 বর্গমিটার এবং ব্যাস = 2π মিটার।

ব্যাস 50% বাড়লে ব্যাস হবে = $(2r + 50\% \text{ of } 2r)$

মিটার = $\left(2r + \frac{50 \times 2r}{100}\right) = 3r$ মিটার \therefore ব্যাসার্ধ = $\frac{3r}{2}$ মিটার \therefore ক্ষেত্রফল = $\pi \left(\frac{3r}{2}\right)^2 = \frac{9r^2}{4} \times \pi$ মিটার

\therefore শতকরা ক্ষেত্রফল বাড়বে = $\left(\frac{\frac{9\pi r^2}{4} - \pi r^2}{\pi r^2} \times 100\right)\% = \left(\frac{9\pi r^2 - 4\pi r^2}{4} \times 100\right)\% = \left(\frac{5\pi r^2}{4} \times \frac{1}{\pi r^2}\right)\% = 125\%$

[Pubali Bank Ltd. TAJO (Cash),- 25-01-2019]

17. Which of the following fractions is the largest?

- A) $\frac{13}{16}$ B) $\frac{7}{8}$ C) $\frac{31}{40}$ D) $\frac{63}{80}$

Ans. B

Solution:

$\frac{13}{16} \times \frac{7}{8} = 104 < 112$; তাই এখানে $\frac{13}{16} < \frac{7}{8}$ আবার, $\frac{7}{8} \times \frac{31}{40} = 280 > 248$; তাই এখানে $\frac{7}{8} > \frac{31}{40}$
আবার, $\frac{7}{8} \times \frac{63}{80} = 560 > 504$; তাই এখানে $\frac{7}{8} > \frac{63}{80}$ \therefore দেখা গেল যে $\frac{7}{8}$ ভগ্নাংশটিই বৃহত্তম।

18. Which of the following is the lowest ratio?

- A) 15:23 B) 7:15 C) 17:25 D) 21:39

Ans. B

Solution:

এখানে, $\frac{15}{23} \times \frac{7}{15} = 225 > 161$; তাই এখানে $\frac{15}{23} > \frac{7}{15}$ আবার, $\frac{7}{15} \times \frac{17}{25} = 175 < 225$; তাই এখানে $\frac{7}{15} < \frac{17}{25}$
আবার, $\frac{7}{15} \times \frac{21}{39} = 273 < 315$; তাই এখানে $\frac{7}{15} < \frac{21}{39}$ অতএব, দেখা যাচ্ছে যে ক্ষুদ্রতম অনুপাত = $\frac{7}{15} = 7:15$

19. The ages of A and B are in the ratio 6:5 and the sum of their ages is 44 years. What will be the ratio of their ages after 8 years?

- A) 8:7 B) 7:6 C) 9:8 D) 3:4

Ans. A

Solution:

ধরি, A এর বয়স $6x$ বছর এবং B এর বয়স $5x$ বছর

প্রশ্নমতে, $6x + 5x = 44 \Rightarrow 11x = 44 \therefore x = \frac{44}{11} = 4$

অতএব, A এর বর্তমান বয়স $6x = 6 \times 4 = 24$ বছর এবং B এর বর্তমান বয়স $5x = 5 \times 4 = 20$ বছর

8 বছর পর A এর বয়স হবে = $24 + 8 = 32$ বছর \therefore 8 বছর পর B এর বয়স হবে = $20 + 8 = 28$ বছর

অতএব, 8 বছর পর A এবং B এর বয়সের অনুপাত হবে = $32:28 = 8:7$.

[Islami Bank Ltd. PO- 04.03.2019]

20. As the price of mango has reduced 20%, it is now possible to buy 2 more mangoes at Tk. 12. What is the correct price of 50 mangoes?

- A) Tk. 50 B) Tk. 40 C) 30 D) 60

Ans. D

Solution:

এখানে, 20% of 12 টাকা = 2.4 টাকা।

20% দাম কমার কারণে 2টি আমর বেশি পাওয়া যাচ্ছে। অর্থাৎ, 2টি আমর দাম = 2.4 টাকা \therefore 50টি আমর দাম = $\frac{2.4 \times 50}{2} = 60$ টাকা

21. If the salary of an employee is reduced by 10 percent for his late attendance and then increased by 10 percent can a pardon, how much does he lose?

- A) 2% B) 1% C) $\frac{1}{2}$ % D) 9%

Ans. B

Solution: $A + B + \frac{A \times B}{100}$ - সূত্রে $A = -10$ এবং $B = 10$ বসালে পাই, $\%C = -10 + 10 + \frac{(-10)(10)}{100} = -1\%$

22. 35% of Nabila's income is equal to 25% of Sakila's income. The ratio of their income is-

- A) 5:7 B) 4:7 C) 7:3 D) 4:3

Ans. A

Solution:

35% of Nabila's income = 25% of Sakila's income

$$\Rightarrow 35\% \times \text{Nabila's income} = 25\% \times \text{Sakila's income} \Rightarrow \frac{\text{Nabila's income}}{\text{Sakila's income}} = \frac{25\%}{35\%} \Rightarrow \frac{\text{Nabila's income}}{\text{Sakila's income}} = \frac{5}{7}$$

23. A man spent $\frac{1}{2}$ of his money and then lost $\frac{1}{4}$ of the remainder. He was left with Tk. 3,600. How much did he start with?
 A) Tk. 7,200 B) Tk. 8,800 C) Tk. 9,600 D) Tk. 10,400 **Ans. C**

Intelligent Solution:

মোট টাকা $8x$ [2 এবং 4 এর গুণফল]

প্রশ্নমতে, $8x - (4x + x) = 3,600 \Rightarrow 3x = 3,600 \therefore x = \frac{3600}{3} = 1,200 \therefore 8x = 8 \times 1,200 = 9,600$

[AUST - 4 Banks (Officer)- Date: 24 May, 2019]

24. A 10% monthly salary increase resulted in a Tk. 9000 per year increase in salary for an employee. What was his monthly salary before the increase?
 (A) Tk. 5000 (B) Tk. 9000 (C) Tk. 7500 (D) Tk. 12000 **Ans. C**

Solution:

$$\text{Salary before increment} = \frac{9000}{110} \times 100 = 7500$$

25. When a certain number is divided by 7, the remainder is 0. If the remainder is not 0 when the number is divided by 14, then the remainder must be-
 (A) 7 (B) 5 (C) 3 (D) 8 **Ans. A**

Solution:

If one number is divisible by x but not divisible by nx i.e. $2x, 3x, 4x$ etc. then this number must be same as divisor i.e. x So. Ans. 7

26. In a college Rahim scored 80 marks out of 150 in History and 95 marks out of 120 in English. If he wants to score 70% marks in 3 subjects, find the minimum marks she should score in Geography out of 100.
 (A) 70 (B) 55 (C) 76 (D) None **Ans. D**

Solution:

$$\text{Total marks} = (150 + 120 + 100) = 370. \therefore \text{Target marks} = \frac{70}{100} \times 370 = 259$$

$$\therefore \text{Need to score} = 259 - (80 + 95) = 84$$

27. The circumference of the circle and the perimeter of the square is equal and the ratio between the diameter of the circle and the side of the square is 7:11. What is the area of the circle?
 (A) 154 cm^2 (B) 160 cm^2 (C) 132 cm^2 (D) can't be determined **Ans. D**

Solution:

Here, recurrent relationship with radius and sides are given but there is no clue about my value like perimeter, diameter or area of square. So it is impossible to calculate the value of radius.

So, It can't be determined.

AUST 6 Banks & 2 Financial Institutions (S.O) Date: 10/05/2019

28. A, B, C subscribe Tk. 50,000 for a business. A subscribes Tk. 4000 more than B and B. Tk. 5000 more than C. Out of a total profit of Tk. 35,000, A receives.

a. Tk. 14,700 b. Tk. 1,900 c. Tk. 13,600 d. Tk. 84000

Ans. A

Solution:

Let, c has x; B has (x + 5000); C has (x + 9000)

ATP, $x + (x + 5000) + (x + 9000) = 50,000 \therefore x = 12000 \therefore A : B : C = 21 : 17 : 12$.

\therefore A receive = $\frac{21}{50} \times 35000 = 14700$

29. In a class, the number of girls is 20% more than that of the boys. The strength of the class is 66. If 4 more girls are admitted to the class, the ratio of the number of boys to that of the girls is-

a. 1:2 b. 1:4 c. 3:5 d. 3:4

Ans. D

Solution:

Let, Boys = 100x \therefore girls = 120 x

ATQ, $100x + 120x = 66 \therefore x = 0.3$

Boys = 30 and girls = 36 \therefore Boys : Girl's = 30 : (36 + 4) = 3:4

30. If $x : y = 5 : 2$, then $(8x + 9y) : (8x + 2y)$ is

a. 29:22 b. 22:29 c. 26:61 d. 61:26

Ans. A

Solution:

$x : y = 5 : 2$

$\Rightarrow \frac{x}{y} = \frac{5}{2}$. So, $\frac{8x + 9y}{8x + 2y} = \frac{8 \times 5 + 9 \times 2}{8 \times 5 + 2 \times 2} = \frac{58}{44} = \frac{29}{22}$

31. Two number are in the ratio 3:5. If 9 is subtracted from each, the new numbers are in the ratio 12:23. The smaller number is-

a. 27 b. 33 c. 49 d. 55

Ans. B

Solution:

Let, smaller = 3x

ATQ, $\frac{3x - 9}{5x - 9} = \frac{12}{23} \Rightarrow 69x - 207 = 60x - 108 \Rightarrow 9x = 99 \therefore x = 11$

বিগত বছরের প্রশ্নপত্র সমাধান

২০১৮ সালের প্রশ্নপত্র সমাধান

01. In a business A and C invested amounts in the ratio 2:1 whereas A and B invested amounts in the ratio 3:2. If their annual profit be Tk 157300, then B's share in the profit is. BSC {Officer (Cash)- 2018}

a. Tk 24200 b. Tk 24200 c. Tk 48000 d. Tk 48400

Hints:

$A : C = 2 : 1 = 2 \times 3 : 1 \times 3 = 6 : 3$

$A : B = 3 : 2 = 3 \times 2 : 2 \times 2 = 6 : 4 \therefore A : B : C = 6 : 4 : 3$

সুতরাং B এর লভ্যাংশ = $157300 \times \frac{4}{6 + 4 + 3} = 157300 \times \frac{4}{13} = 48400$

02. If the numerator of a fraction is increased by 150% and the denominator of a fraction increased by 200% fraction becomes 10/19. Find the fraction. BSC {Officer (Cash)- 2018}

a. $\frac{12}{17}$ b. $\frac{10}{16}$ c. $\frac{12}{19}$ d. $\frac{9}{11}$

Hints:

ধরি, ভগ্নাংশটির লব (numerator) x এবং হর (denominator) y

$$\therefore \frac{x + x \times \frac{150}{100}}{y + y \times \frac{200}{100}} = \frac{10}{19} \Rightarrow \frac{2.5x}{3y} = \frac{10}{19} \Rightarrow \frac{x}{y} = \frac{10 \times 3}{19 \times 2.5} \therefore \frac{x}{y} = \frac{12}{19}$$

- 03. If the numerator of fraction is increased by 200% and the denominator is increased by 350%. The resultant fraction is 5/12. What was the original fraction?** BSC {Officer (Cash)- 2018}

- a. $\frac{5}{9}$ b. $\frac{5}{8}$ c. $\frac{7}{12}$ d. $\frac{11}{12}$

Hints:

ধরি, ভগ্নাংশটির লব (numerator) x এবং ভগ্নাংশটির হর (denominator) y

$$\therefore \text{ভগ্নাংশটি} = \frac{x}{y}$$

$$\text{প্রশ্নমতে, } \frac{x + x \text{ এর } \frac{200}{100}}{y + y \text{ এর } \frac{350}{100}} = \frac{5}{12} \Rightarrow \frac{3x}{4.5y} = \frac{5}{12} \Rightarrow \frac{x}{y} = \frac{5}{12} \times \frac{4.5}{3} \therefore \frac{x}{y} = \frac{5}{8}$$

- 04. There are two numbers, 1st number is 12 more than the 2nd number. The average of the two numbers is 19. If 2 is added in both numbers, find the ratio of the numbers.** BSC {Officer (Cash)- 2018}

- a. 5:9 b. 11:9 c. 4:9 d. 9:5

Hints:

ধরি, ২য় সংখ্যাটি x \therefore ১ম সংখ্যাটি $x + 12$

$$\text{প্রশ্নমতে, } \frac{x + x + 12}{2} = 19 \Rightarrow 2x + 12 = 38 \therefore x = 13$$

$$\therefore \text{১ম সংখ্যাটি, } x + 12 = 13 + 12 = 25$$

$$\text{প্রত্যেক সংখ্যার সাথে 2 যোগ করলে তাদের অনুপাত} = 25 + 2 : 13 + 2 = 27:15 = 9:5$$

- 05. X, Y and Z can do a piece of work in 6 hours. X and Y can do the same work in 8 hours and Y and Z can do the same work in 12 hours. In how many times will X and Z do the same work?** BSC {Officer (Cash)- 2018}

- a. 6 hours b. 8 hours c. 10 hours d. 12 hours

Hints:

X, Y এবং Z 1 ঘণ্টায় করে $\frac{1}{6}$ অংশ

X এবং Y 1 “ “ $\frac{1}{8}$ “

$$\therefore Z \text{ 1 ঘণ্টায় করে } \left(\frac{1}{6} - \frac{1}{8}\right) \text{ অংশ} = \frac{4-3}{24} \text{ অংশ} = \frac{1}{24} \text{ অংশ}$$

আবার, Y এবং Z 1 ঘণ্টায় করে $\frac{1}{12}$ অংশ

$$\therefore X \text{ 1 ঘণ্টায় করে } \left(\frac{1}{6} - \frac{1}{12}\right) \text{ অংশ} = \frac{2-1}{12} \text{ অংশ} = \frac{1}{12} \text{ অংশ}$$

সুতরাং x ও Z সম্পূর্ণ কাজটি একত্রে (1×8) বা 8 ঘণ্টায় সম্পন্ন করে। = 120 টাকা

- 06. There are 2 numbers in the ratio of 4:5. If 4 is subtracted from both numbers the ratio becomes 3:4. What will be the ratio if 4 is added in the both numbers?** BSC {Officer (Cash)- 2018}

- a. 1:2 b. 2:3 c. 5:6 d. 1:4

Hints:ধরি, সংখ্যা দুটি $4x$ ও $5x$

$$\therefore \frac{4x-4}{5x-4} = \frac{3}{4} \Rightarrow 16x-16 = 15x-12 \Rightarrow 16x-15x = 16-12 \therefore x = 4$$

$$\text{এখন, } \frac{4x+4}{5x+4} = \frac{4 \times 4 + 4}{5 \times 4 + 4} = \frac{20}{24} = \frac{5}{6} \therefore (4x+4):(5x+4) = 5:6$$

- 07. The income of 'A' is 20% higher than that of 'B'. The income of 'B' is 25% less than of 'C'. What percent less is A's income from C's income?** BSC {Officer (Cash)- 2018}

a. 7% b. 8% c. 9% d. 10%

Hints:

ধরি, B এর আয় 100 টাকা

$$\therefore A \text{ " " } 120 \text{ " "}$$

আবার, B এর আয় 75 টাকা হলে C এর আয় 100 টাকা

$$\therefore B \text{ " " } 100 \text{ " " } C \text{ " " } \frac{100 \times 100}{75} \text{ টাকা} = \frac{400}{3} \text{ টাকা}$$

$$C \text{ অপেক্ষা A এর কম আয়ের হার } \left(\frac{\frac{400}{3} - 120}{\frac{400}{3}} \times 100 \right) \% = \left(\frac{\frac{400-360}{3}}{\frac{400}{3}} \times 100 \right) \% = \left(\frac{40}{3} \times \frac{3}{400} \times 100 \right) \% = 10\%$$

- 08. The ratio of two numbers is 7:4. If 8 is added to the the numbers ratio becomes 13:8, what is the smaller number?** BSC {Officer (Cash)- 2018}

a. 40 b. 56 c. 38 d. 52

Hints:ধরি, সংখ্যা দুটি $7x$ ও $4x$

$$\therefore \frac{7x+8}{4x+8} = \frac{13}{8} \Rightarrow 56x+64 = 52x+104 \Rightarrow 56x-52x = 104-64 \therefore 4x = 40 \therefore \text{ছোট সংখ্যাটি- } 40$$

- 09. Three boys have marbles in the ratio of 19:5:3. If the boy with the least number has 9 marbles, how many marbles does the boy with the greatest number have?** BSC, 3 Govt. Banks & FI (SO-18)

a. 57 b. 33 c. 27 d. 81

Hints:ধরি, মোট মার্বেল সংখ্যা = x টি।

$$\therefore x \times \frac{3}{27} = 9 \quad [\because 19+5+3=27] \Rightarrow x = 81 \therefore \text{সর্বাধিক মার্বেল সংখ্যা} = 81 \times \frac{19}{27} = 57 \text{ টি।}$$

- 10. An iron rod that weighs 24 kg is cut into two pieces so that one of these pieces weighs 16 kg and is 34 m long. If the weight of each piece is proportional to its length, how long is the other piece?** BSC, 3 Govt. Banks & FI (SO-18)

a. 11 m b. 17 m c. 34 m d. 68 m

Hints:২য় টুকরার ওজন হবে = $24 - 16 = 8$ কেজি

$$\text{ধরি, ২য় টুকরার দৈর্ঘ্য} = x \text{ মি. } \therefore 16:34 = 8:x \Rightarrow \frac{16}{34} = \frac{8}{x} \Rightarrow x = 17$$

- 11. The price of a pen is 25% more than the price of a book. The price of a pen holder is 50% more than the price of the book. How much is the price of the pen holder more than the price of the pen.** BSC, 3 Govt. Banks & FI (SO-18)

a. 50% b. 25% c. 20% d. 37.5%

Hints:

ধরি, বই-এর দাম = 100 টাকা

$$\text{কলম " " } = 100 + 100 \times \frac{25}{100} = 125 \text{ টাকা}$$

$$\text{কলমদানি " " } = 100 + 100 \times \frac{50}{100} = 150 \text{ টাকা}$$

$$\therefore \text{ দাম বেশি } = 150 - 125 = 25 \text{ টাকা} \quad \therefore \text{ দাম বেশির হার } = \frac{25}{125} \times 100\% = 20\%$$

12. A 10% monthly salary increase resulted in a Tk. 9000 per year increase in salary for an employee. What was his monthly salary before the increase? BSC, 3 Govt. Banks & FI (SO-18)

a. Tk. 7500 b. Tk. 8500 c. Tk. 5000 d. Tk. 9500

Hints:

1 বছরের বৃদ্ধি পায় 9000 টাকা [∴ 1 বছর = 12 মাস]

$$\therefore 1 \text{ মাসে " " } (9000 \div 12) = 750 \text{ টাকা}$$

এখন, 10% = 750

$$\therefore 1\% = \frac{750}{10}$$

$$\therefore 100\% = \frac{750 \times 100}{10} = 7500 \text{ টাকা।}$$

13. The ratio between the perimeter and the breadth of a rectangular is 5:1. If the area of the rectangle is 216 cm², what is the length of the rectangle? BSC, 3 Govt. Banks & FI (SO-18)

Hints:

ধরি, breadth = x

$$\text{perimeter} = 5x$$

$$\therefore 2(\text{breadth} + \text{length}) = 5x \Rightarrow 2 \text{ length} = 3x \Rightarrow \text{length} = \frac{3x}{2} \quad \therefore \frac{3x}{2} \times x = 216$$

$$\Rightarrow x^2 = \frac{216 \times 2}{3} \Rightarrow x^2 = 144 \quad \therefore x = 12 \quad \therefore \text{length} = \frac{3 \times 12}{2} = 18 \text{ cm}$$

14. Increasing the original price of an item by 10%, then decreasing by 20% and then again increasing the price by 10% is equivalent: BSC, 3 Govt. Banks & FI (Senior Officer -18)

a. 4.4% increase b. 3.2% decrease c. 3.5% decrease d. None

Hints:

প্রথম দুটি ক্ষেত্রে বিবেচনা করি,

$$\text{ক্ষতির হার} = \left(10 - 20 - \frac{10 \times 20}{100}\right)\% = -12\%$$

সুতরাং ক্রয়মূল্য 100 টাকা হলে বিক্রয়মূল্য = 88 টাকা; যেহেতু 10% বৃদ্ধি পায়,

$$\therefore \text{বিক্রয়মূল্য} = 88 + 88 \times \frac{10}{100} = 96.8 \text{ টাকা; যেহেতু 10\% বৃদ্ধি পায়,}$$

$$\therefore \text{বিক্রয়মূল্য} = 88 + 88 \times \frac{10}{100} = 96.8 \text{ টাকা।} \quad \therefore \text{মোট শতকরা হ্রাস পেল} = (100 - 96.8) \text{ টাকা} = 3.2 \text{ টাকা}$$

15. In a club 50% of the male voters and 80% of the female voters voted for candidate A. If candidate A received 70% of the total votes, what is the ratio of male to female votes? BSC, 3 Govt. Banks & FI (Senior Officer -18)

a. 1/3 b. 3/4 c. 1/4 d. 1/2

Hints:

ধরি, পুরুষ সংখ্যা = x

মহিলা " = y

প্রশ্নমতে,

x- এর 50% + y এর 80% = (x + y) এর 70%

$$\Rightarrow 50x + 80y = 70(x + y) \Rightarrow 50x - 70y = 70x - 80y \Rightarrow -20x = -10y \Rightarrow 2x = y \Rightarrow \frac{x}{y} = \frac{1}{2}$$

16. If x: y = 5: 3, then (8x + 5y): (8x - 5y) = ?

BSC, 5 Govt. Banks & FI (Officer-18)

a. 5:11

b. 6:5

c. 5:6

d. 11:5

Hints:

$$x:y = 5:3 \Rightarrow \frac{x}{y} = \frac{5}{3} \Rightarrow \frac{x}{y} \times \frac{8}{5} = \frac{5}{3} \times \frac{8}{5} \Rightarrow \frac{8x}{5y} = \frac{8+3}{8-3} \quad [\because \text{যোজন-বিয়োজন করে}]$$

$$\therefore (8x + 5y): (8x - 5y) = 11:5$$

17. একজন ব্যবসায়ী ৮০ টাকায় একটি পণ্য বিক্রি করে ২৫% লাভ করে। ব্যয় ও বিক্রি মূল্যের অনুপাত কত? BSC, 5 Govt. Banks & FI (Officer-18)

ক. ৩:৪

খ. ৪:৫

গ. ৫:৬

ঘ. ২:৩

Hints:

২৫% লাভে,

বিক্রয়মূল্য ১২৫ টাকা হলে ক্রয়মূল্য ১০০ টাকা

$$\begin{array}{ccccccc} " & 1 & " & " & " & \frac{100}{125} & " \\ & & & & & & \end{array}$$

$$\begin{array}{ccccccc} " & 80 & " & " & " & \frac{100 \times 80}{125} & " = 64 \text{ টাকা} \quad \therefore \text{ব্যয় ও বিক্রি মূল্যের অনুপাত} = 64:80 = 8:10 \end{array}$$

18. একটি কোম্পানির ৪৬% কর্মচারি পুরুষ। যদি ৬০% কর্মচারি ইউনিয়ন করে এবং এর মধ্যে ৭০% কর্মচারি পুরুষ হয়, তাহলে শতকরা কতজন মহিলা কর্মচারি ইউনিয়ন করে না? BSC, 5

Govt. Banks & FI (Officer-18)

ক. ৯০%

খ. ৮৭.৫%

গ. ৫০%

ঘ. ৩৬%

Hints:

ধরি, মোট কর্মচারি ১০০ জন,

পুরুষ = ৪৬ জন, মহিলা = ৫৪ জন

∴ ইউনিয়ন করে ৬০ জন

$$\therefore \text{ইউনিয়ন করে এমন পুরুষ} = 60 \times \frac{70}{100} = 42 \text{ জন}$$

$$\begin{array}{ccccccc} " & " & " & \text{নারী} & = & 60 - 42 & = 18 \text{ জন} \end{array}$$

$$\therefore \text{" করেনা এমন নারী} = 54 - 18 = 36$$

∴ মহিলা কর্মচারি ইউনিয়ন করে না ৩৬%

19. সবচেয়ে বড় সংখ্যা কোনটি?

BSC, 5 Govt. Banks & FI (Officer-18)

ক. ৮/১২

খ. ১৪/১৮

গ. ২/৩

ঘ. ১৫/২০

Hints:

১২, ১৮, ৩ এবং ২০ এর ল.সা.গু = ১৮০

$$\text{এখন } \frac{8}{12} = \frac{8 \times 15}{12 \times 15} = \frac{120}{180}, \frac{14}{18} = \frac{14 \times 10}{18 \times 10} = \frac{140}{180}, \frac{2}{3} = \frac{2 \times 60}{3 \times 60} = \frac{120}{180}, \frac{15}{20} = \frac{15 \times 9}{20 \times 9} = \frac{135}{180} \quad \therefore \text{বৃহত্তম সংখ্যা} = \frac{140}{180}$$

20. একজন কর্মচারির বেতন ২০% বৃদ্ধির পর সাপ্তাহিক ১৮০ টাকা পেল। তার আগের সাপ্তাহিক বেতন কত ছিল?

ক. ১৪৪ টাকা

খ. ১৫০ টাকা

গ. ১৬০ টাকা

ঘ. ১৬৪ টাকা

Hints:

২০% বৃদ্ধিতে,

বর্তমান বেতন ১২০ হলে পূর্ণ বেতন = ১০০ টাকা

$$\text{" " ১ " " " " = } \frac{১০০}{১২০} \text{" "}$$

$$\text{" " ১৮০ " " " " = } \frac{১০০ \times ১৮০}{১২০} \text{" " = ১৫০ টাকা}$$

21. কে ভগ্নাংশে প্রকাশ করলে কত হবে?

ক. ৭/২০

খ. ৭/২৫

গ. ৫/২০

ঘ. ৫/২৫

Hints:

$$০.৩৫ = \frac{৩৫}{১০০} = \frac{৭}{২০}$$

22. A stock is currently valued at Tk. 40 per share. If the price increases by 20 percent and then decreases by 25 percent, what will be the new value of the share? BSC, Sonali Bank Ltd. & Janata Bank Ltd. (SO, [It/ICT]-18)

a. Tk. 36

b. Tk. 40

c. Tk. 48

d. Tk. 30

Hints:

দামের পরিবর্তনের হার $\left(20 - 25 - \frac{20 \times 25}{100}\right)\%$ সুতরাং, শেয়ারের দাম সার্বিকভাবে ১০% কমে গেল।

$$\therefore 10\% \text{ কমে বর্তমান দাম} = \left(40 - 40 \times \frac{10}{100}\right) \text{ টাকা} = 36 \text{ টাকা}$$

23. Painting a wall costs BDT. 50 per sq. m. If the 20m long wall has a width of 10m, how much would it cost to paint 7/10th of the wall? BSC, Sonali Bank Ltd. & Janata Bank Ltd. (SO, [It/ICT]-18)

a. 5000

b. 10000

c. 8000

d. 7000

Hints:

দেয়ালের ক্ষেত্রফল = (20×10) বর্গমিটার = 200 বর্গমিটার

এখন, $\frac{7}{10}$ অংশ রং করতে খরচ হবে = $\left(200 \times \frac{7}{10} \times 50\right)$ টাকা = 700 টাকা।

24. 3/4th of a square were taken to form shape A and the rest was made to form shape B. Shape A was divided into four equal squares (shape C), what will be the ratio of the one shape C to one shape B. BSC, Sonali Bank Ltd. & Janata Bank Ltd. (SO, [It/ICT]-18)

a. 1:4

b. 3:16

c. 1:2

d. 3:4

Hints:

ধরি, একটি বর্গ = 1 অংশ

Shape A এর পরিমাণ = $\frac{3}{4}$ “

Shape B “ “ = $\left(1 - \frac{3}{4}\right) = \frac{1}{4}$ অংশ।

এখন, shape C এর পরিমাণ = $\frac{3}{4} \div 4 = \frac{3}{4} \times \frac{1}{4} = \frac{3}{16}$ \therefore Shape C: Shape B = $\frac{3}{16} : \frac{1}{4} = \frac{3}{16} \times 16 : \frac{1}{4} \times 16 = 3:4$

25. If w is 10% less than x, and y is 30% less than z, they wy is what percent less than xz? Sonali Bank Ltd. (SO [MCQ]-2018)

a. 10%

b. 20%

c. 37%

d. 40%

Hints:

ধরি, $x = 100$ than $w = 100 - 100 \times \frac{10}{100} = 90$. আবার, If $z = 100$ then $y = 100 - 100 \times \frac{30}{100} = 70$

সুতরাং, $wy = 90 \times 70 = 6300$ and $xz = 100 \times 100 = 10000$

\therefore Difference = $10000 - 6300 = 3700$ \therefore Difference in percentage = $\frac{3700}{10000} \times 100\% = 37\%$

26. Which of the numbers below is not equivalent to 4%?

Sonali Bank Ltd. (SO [MCQ]-2018)

- a. $1/25$ b. $4/100$ c. 0.40 d. 0.04

Hints:

আমরা অপশনগুলো বিবেচনা করি- a. $\frac{1}{25} = \frac{1}{25} \times 100\% = 4\%$; b. $\frac{4}{100} = \frac{1}{25} = 4\%$;

c. $0.40 = \frac{4}{10} = \frac{4}{10} \times 100\% = 40\%$; d. $0.04 = \frac{4}{100} = \frac{1}{25} = 4\%$

সুতরাং c নং অপশনটি ছাড়া বাকি সবগুলো option- এর মান হচ্ছে 4% এর সমান। সুতরাং সঠিক উত্তর হবে c.0.40।

27. After being dropped a certain ball always bounces back to 2/5 of the height of its previous bounce. After the first bounce it reaches a height of 125 inches. How high (in inches) will it reach after its fourth bounce?

Sonali Bank Ltd. (SO [MCQ]-2018)

- a. 20 b. 8 c. 5 d. 3.2

Hints: After the first bounce it reached to 125 inches.

\therefore “ “ Second “ “ “ “ $125 \times \frac{2}{5} = 50$ inches

\therefore “ “ third “ “ “ “ $50 \times \frac{2}{5} = 20$ inches

\therefore “ “ fourth “ “ “ “ $20 \times \frac{2}{5} = 8$ inches

28. Find the largest fraction from the following:

Sonali Bank Ltd. (SO [MCQ]-2018)

- a. $-5/11$ b. $-8/13$ c. $3/8$ d. $1/4$

Hints:

$\frac{-5}{11} \times \frac{-8}{13}$ এখানে, $-65 > -88$ $\therefore \frac{-5}{11} > \frac{-8}{13}$

$\frac{-5}{11} \times \frac{-7}{19}$ এখানে, $-95 < -77$ $\therefore \frac{-7}{19} > \frac{-5}{11}$

$\frac{-7}{19} \times \frac{-15}{97}$ এখানে, $-679 < -77$ $\therefore \frac{-15}{97} > \frac{-7}{19}$ সুতরাং বৃহত্তম ভগ্নাংশটি হলো $\frac{-15}{97}$

29. 125 gallons of a mixture contains 20% water. What amount of additional water should be added such that water content is raised to 25%?

Sonali Bank Ltd. Officer, (Cash-18)

- a. $\frac{15}{2}$ gallons b. $\frac{17}{2}$ gallons c. $\frac{19}{2}$ gallons d. $\frac{25}{3}$ gallons

Hints:

20% of 125 = $125 \times \frac{20}{100} = 25$

ধরি, x gallons পানি মেশাতে হবে।

$$\therefore (25 + x) = (125 + x) \text{ এর } \frac{25}{100} \Rightarrow 25 + x = \frac{125 + x}{4} \Rightarrow 100 + 4x = 125 + x \Rightarrow 3x = 25 \therefore x = \frac{25}{3}$$

30. A, B and enter into partnership by making investments in the ratio 3:5:7. After a year, C invests another Tk. 337600 while A withdraws Tk. 45600. The ratio of investments then changes to 24:59:67. How much does A invest initially? Sonal Bank Ltd. Officer, (Cash-18)
- a. Tk. 140600 b. Tk. 141600 c. Tk. 131600 d. Tk. 140500

Hints:

ধরি, A এর initial investment 3x
B “ “ “ 5x
C “ “ “ 7x

$$\therefore (3x - 45600) : 5x = 24:59$$

$$\Rightarrow \frac{3x - 45600}{5x} = \frac{24}{59} \Rightarrow \frac{x - 15200}{5x} = \frac{8}{59} \Rightarrow 59x - 40x = 15200 \times 59 \Rightarrow x = \frac{15200 \times 54}{19} \therefore x = 47,200$$

\therefore A এর initial investment $(3 \times 47200) = 1,41,600$

31. Karim has 40% more stamps than Rahim, if he gives 45 of his stamps to Rahim, then Rahim will have 10% more stamps than Karim. How many stamp did Karim begin with? Sonal Bank Ltd. Officer, (Cash-18)
- a. 175 b. 200 c. 220 d. 245

Hints:

ধরি, রহিমের আছে x টি

$$\therefore \text{করিমের } \left(x + x \text{ এর } \frac{40}{100} \right) \text{ টি} = \left(x + \frac{2x}{5} \right) \text{ টি} = \frac{7x}{5} \text{ টি}$$

$$\Rightarrow (x + 45) - \left(\frac{7x}{5} - 45 \right) \times \frac{10}{100} = \left(\frac{7x}{5} - 45 \right) \Rightarrow 10x + 450 - \frac{7x}{5} + 45 = 14x - 450$$

$$\Rightarrow 4x + \frac{7x}{5} = 945 \Rightarrow 20x + 7x = 945 \times 5 \Rightarrow x = \frac{945 \times 5}{27} \therefore x = 175 \therefore \text{করিমের stamp সংখ্যা} = \frac{175 \times 7}{5} = 245$$

32. P and Q start a business with initial investments in the ratio of 13:8. Their corresponding annual profits are in the ration of 7:5. If P invested his money for 7 months, find the time period for which Q invested his money. Sonal Bank Ltd. Officer, (Cash-18)
- a. 8 months b. 9 months c. 10 months d. 11 months

Hints:

ধরি, Q এর বিনিয়োগের সময় x months

$$\therefore (13 \times 7) : (8 \times x) = 7:5 \Rightarrow \frac{13 \times 7}{8x} = \frac{7}{5} \Rightarrow 8x = 65 \Rightarrow x = \frac{65}{8} \Rightarrow x = 8.125 \therefore x \approx 8$$

33. At a symposium, 20% of the professors are psychologists, 60% are biologists and the remaining 12 professors are economist. If 20 of the professors wear glasses, what percent of the professors do not wear glasses? Sonal Bank Ltd. (SO-18)
- a. 20% b. 331% c. 50% d. 66.2/3%

Hints:

ধরি, মোট professor এর সংখ্যা x

$$\therefore x - \frac{20x}{100} - \frac{60x}{100} = 12 \Rightarrow x - \frac{x}{5} - \frac{3x}{5} = 12 \Rightarrow \frac{5x - x - 3x}{5} = 12 \therefore x = 60$$

number of professors do not wear glasses $(60 - 20) = 40 \therefore$ required percentage $\left(\frac{40}{60} \times 100 \right) \% = 66 \frac{2}{3} \%$

34. In a department, $\frac{3}{5}$ of the workers are men and the rest are women. If $\frac{1}{2}$ of the men and $\frac{3}{7}$ of the women in the department are over 35, what fraction of all the workers in the department are over 35?

Sonali Bank Ltd. Officer, (Cash-18)

- a. $\frac{33}{70}$ b. $\frac{66}{70}$ c. $\frac{33}{140}$ d. $\frac{35}{140}$

Hints:

ধরি, মোট worker এর সংখ্যা x

$$\therefore \text{men " " " " } \frac{3x}{5}$$

$$\therefore \text{Women work এর সংখ্যা } \left(x - \frac{3x}{5}\right) = \frac{2x}{5}$$

$$\text{Other 35 men worker } \frac{3x}{5} \times \frac{1}{2} = \frac{3x}{10}$$

$$\text{" 35 women " } \frac{2x}{5} \times \frac{3}{7} = \frac{6x}{35}$$

$$\text{Total over 35 workers} = \left(\frac{3x}{10} + \frac{6x}{35}\right) = \frac{21x + 12x}{70} = \frac{33x}{70} \quad \text{So, required fraction } \frac{\frac{33x}{70}}{x} = \frac{33}{70}$$

35. The ratio of investments of two partners P and Q is 7:5 and the ratio of their profits is 7: 10. If P invested the money for months, find for how much time did Q invest the money.

Sonali Bank Ltd. Officer, (Cash-18)

- a. 7 months b. 10 months c. 9 months d. 11 months

[Note: P এর বিনিয়োগ 5 মাসের জন্য হলে উত্তর হবে 10]

Hints:

ধরি, Q এর বিনিয়োগের সময় x মাস

$$(7 \times 5) : (5 \times x) = 7:10 \Rightarrow \frac{7 \times 5}{5x} = \frac{7}{10} \Rightarrow 35x = 35 \times 10 \quad \therefore x = 10 \quad \text{Ans: 720 Tk. and 1280 Tk.}$$

36. Find the largest fraction from the following –

Sonali Bank Ltd., (Officer [MCQ]-18)

- a. $-\frac{15}{30}$ b. $-\frac{8}{64}$ c. $-\frac{7}{98}$ d. $-\frac{15}{90}$

Hints:

এখানে, প্রত্যেকটি ভগ্নাংশই ঋণাত্মক। সুতরাং যে ভগ্নাংশের সাংখ্যিক মান সর্বনিম্ন ঐ ভগ্নাংশটি হবে সর্বোচ্চ।

$$\text{এখানে, } \frac{-15}{30} = -\frac{1}{2}; \frac{-8}{64} = \frac{-1}{8}; \frac{-7}{98} = -\frac{1}{14} \text{ এবং } \frac{-15}{90} = \frac{-1}{6}$$

এখানে, প্রত্যেকটি ভগ্নাংশের লব (1) সমান। এখন ঋণাত্মক ভগ্নাংশের ক্ষেত্রে যেহেতু লবের মান সমান সেহেতু যে ভগ্নাংশের হর বড়, সেটি বৃহত্তম ভগ্নাংশ।

$$\text{সুতরাং এখানে বৃহত্তম ভগ্নাংশ হলো } -\frac{1}{14} \text{ বা } -\frac{7}{98}$$

37. As the price of mango has reduced 20%, it is now possible to buy 2 more mangoes at Tk. 12 What is the current price of 50 mangoes?

Sonali Bank Ltd., (Officer [MCQ]-18)

- a. Tk. 50 b. Tk. 40 c. Tk. 30 d. Tk. 60

Hints:

100 টাকায় কমে= 20 টাকা

$$\therefore 1 \text{ " " " } = \frac{20}{100} \text{ " "}$$

$$\therefore 12 \text{ " " " } = \frac{20 \times 12}{100} = \frac{240}{100} = \frac{24}{10} \text{ টাকা}$$

$$\therefore 2 \text{ টি আমের বর্তমান দাম} = \frac{24}{10} \text{ টাকা} \quad \therefore 50 \text{ টি আমের বর্তমান দাম} = \frac{24 \times 50}{20} = 60 \text{ টাকা}$$

38. If the salary of an employee is reduced by 10 percent for his late attendance and then increased by 10 percent on a pardon, how much does he lose? Sonali Bank Ltd., (Officer [MCQ]-18)
- a. 2% b. 1% c. $-\frac{1}{2}$ % d. 9%

Hints:

এখানে, শতকরা হ্রাস পেল = $10 - 10 - \frac{10 \times 10}{100} = -1\%$ সুতরাং শতকরা 1% হ্রাস পেল।

39. 35% of Nabila's income is equal to 25% of Naru's income. The ratio of their income is – Sonali Bank Ltd., (Officer [MCQ]-18)
- a. 5:7 b. 4:7 c. 7:3 d. 4:3

Hints:

ধরি, নাবিলার মোট উপার্জন = x টাকা
এবং নুরুর " " = y “

প্রশ্নমতে, 35% of x = 25% of y $\Rightarrow \frac{35}{100}x = \frac{25}{100}y \Rightarrow \frac{x}{y} = \frac{25}{35} \Rightarrow \frac{x}{y} = \frac{5}{7} \therefore x:y = 5:7$

40. A man spent $\frac{1}{2}$ of his money and then lost $\frac{1}{4}$ of the remainder. He was left with Tk. 3,600. How much did he start with? Sonali Bank Ltd., (Officer [MCQ]-18)
- a. Tk. 7,200 b. Tk. 8,800 c. Tk. 9,600 d. Tk. 10,400

Hints:

ধরি,

\therefore তার মোট আয় = x টাকা \therefore তিনি মোট খরচ করেন = $\frac{x}{2}$ টাকা \therefore অবশিষ্ট টাকা = $x - \frac{x}{2}$ টাকা = $\frac{x}{2}$ টাকা

হারিয়ে ফেলেন = $\left(\frac{x}{2} \times \frac{1}{4}\right)$ টাকা = $\frac{x}{8}$ টাকা \therefore অবশিষ্ট টাকা = $\left(\frac{x}{2} - \frac{x}{8}\right) = \frac{4x - x}{8} = \frac{3x}{8}$ টাকা

প্রশ্নমতে, $\frac{3x}{8} = 3600 \Rightarrow x = \frac{3600 \times 8}{3} \therefore x = 9600$ টাকা

41. If x is 30% greater than y, what percent of y is x? Rupali Bank Ltd. Officer, (Cash-18)
- a. 70 b. 77 c. 120 d. 130

Hints:

যেহেতু x হচ্ছে y অপেক্ষা 30% বেশী, সুতরাং y যদি 100 হয় তাহলে x হবে $(100 + 30) = 130$ সুতরাং x হচ্ছে y এর 130%।

42. ০.৪৭ এর সাধারণ ভগ্নাংশ কত? BKB, Data Entry/Control (Operator-18)
- ক. $\frac{৪৭}{১০}$ খ. $\frac{৪৭}{৯৯}$ গ. $\frac{৪৭}{১০০}$ ঘ. $\frac{১০০}{৪৭}$

Hints: $০.৪৭ = \frac{৪৭}{১০০}$

43. কোন ভগ্নাংশটি জুড়তম? BKB, Data Entry/Control (Operator-18)

Hints:

$\frac{৫}{৬} \times \frac{৫}{৮}$ এখানে (৫×৮) বা ৪০ $>$ (৫×৬) বা ৩০ $\therefore \frac{৫}{৬} > \frac{৫}{৮}$

$$\frac{5}{8} \times \frac{8}{8} \text{ এখানে } (5 \times 8) \text{ বা } 80 > (5 \times 6) \text{ বা } 30 \therefore \frac{5}{8} > \frac{8}{8}$$

$$\frac{8}{8} \times \frac{8}{10} \text{ এখানে } (5 \times 8) \text{ বা } 80 > (8 \times 8) \text{ বা } 64 \therefore \frac{8}{10} > \frac{5}{8} \therefore \text{ ক্ষুদ্রতম সংখ্যা } \frac{8}{10}$$

44. ৪০ টাকায় ১০টি কলা কিনে ২৫% লাভে বিক্রয়ে ১টি কলা কত টাকায় বিক্রয় করতে হবে? BKB, Data Entry/Control (Operator-18)
 ক. ৮ টাকা খ. ৫ টাকা গ. ৬ টাকা ঘ. ৭ টাকা

Hints:

১০টি কলার ক্রয়মূল্য ৪০ টাকা

$$\therefore ১টি \text{ " " } (৪০ \div ১০) = ৪ \text{ টাকা}$$

$$\therefore ২৫\% \text{ লাভে } ১টি \text{ কলার বিক্রয়মূল্য } \left(৪ + ৪ \text{ এর } \frac{২৫}{১০০} \right) = (৪ + ১) = ৫ \text{ টাকা}$$

45. যজ্ঞাংশে ৪০%, দালানে ২৫%, কাঁচামালে ১৫% এবং আসবাবপত্র ৫% টাকা খরচ করার পর হাসানের হাতে ১৩০৫ টাকা থাকে। তার কাছে কত টাকা ছিল? Karmasangsthan Bank (Data Entry Operator-18)

Hints:

ধরি, হাসানের কাছে ছিল ১০০ টাকা সুতরাং, তিনি মোট খরচ করেন = (৪০ + ২৫ + ১৫ + ৫) টাকা = ৮৫ টাকা

সুতরাং তার কাছে অবশিষ্ট রইল = (১০০ - ৮৫) টাকা = ১৫ টাকা

এখন, অবশিষ্ট ১৫ টাকা হলে মোট টাকার পরিমাণ ১০০ টাকা

$$\text{" ১ " " " " " " " } \frac{১০০}{১৫} \text{"}$$

$$\text{" ১ " " " " " " " } \frac{১০০}{১৫} \text{"}$$

$$\text{" ১৩০৫ " " " " " " " } \frac{১০০ \times ১৩০৫}{১৫} \text{" = ৮৭০০ টাকা উত্তর: ৮৭০০ টাকা।}$$

46. Increasing the original price of an item by 10%, then decreasing by 20% and then again increasing the price by 10% is equivalent: PKB, SE(Officer-18)

a. 4.4% increase b. 3.2% decrease c. 3.5% decrease d. None

Hints:

প্রথম দুটি ক্ষেত্রে বিবেচনা করি, ক্ষতির হার = $10 - 20 - \frac{10 \times 20}{100} = -12\%$

সুতরাং ক্রয়মূল্য 100 টাকা হলে বিক্রয়মূল্য = 88 টাকা

$$\text{" " 1 " " " " } = \frac{88}{100} \text{"}$$

যেহেতু 10% বৃদ্ধি পায়, \therefore ক্রয়মূল্য 100 টাকা হলে বিক্রয়মূল্য 110 টাকা

$$\text{" 1 " " " " } \frac{110}{100} \text{"}$$

$$\text{" 88 " " " " } \frac{110 \times 88}{100} \text{"}$$

$$= 96.8 \text{"}$$

\therefore শতকরা হ্রাস পেল = $(100 - 96.8) \text{ টাকা} = 3.2\%$

47. There are n students in a school. If r% among the students are 12 years or younger, which of the following expressions represents the number of students who are older than 12? PKB, SE(Officer-18)

a. $n(1 - r)$ b. $100(1 - r)n$ c. $n(1 - r)/100$ d. $n(100 - r)/100$

52. Three individuals contributed Tk. 8000 each toward the purchase of a computer. If they bought the computer on sale for Tk. 19500 plus 10% sales tax, how much money should be refunded to each individual? PKB, SEO (Cash-18)
- a. Tk. 650 b. Tk. 850 c. Tk. 1500 d. Tk. 1950

Hints:

তিন জনের সর্বমোট টাকার পরিমাণ = $3 \times 8000 = 24000$ টাকা \therefore 19500 টাকায় ট্যাক্স = $19500 \times \frac{10}{100} = 1950$ টাকা

সর্বমোট খরচ = $19500 + 1950 = 21450$ \therefore মোট ফেরত দিতে হবে = $24000 - 21450 = 2550$

\therefore প্রত্যেকে ফেরত পাবে = $(2550 \div 3) = 850$ টাকা

53. A 10% monthly salary increase resulted in a Tk. 9000 per year increase in salary for an employee. What was his monthly salary before the increase? PKB, SEO (Cash-18)
- a. Tk. 7500 b. Tk. 9000 c. Tk. 5000 d. Tk. 12000

Hints:

1 বছরে বৃদ্ধি পায় 9000 টাকা [\therefore 1 বছর = 12 মাস]

\therefore 1 মাসে " " $(9000 \div 12) = 750$ টাকা

এখন, 10% = 750 \therefore 1% = $\frac{750}{10}$ \therefore 100% = $\frac{750 \times 100}{10} = 7500$ টাকা

54. The lengths of the sides of a triangle are in the ratio of 3 to 5 to 6. If the perimeter of the triangle is 70, what is the length of the longest side? PKB, SEO (Cash-18)
- a. 10 b. 15 c. 25 d. 30

Hints:

ত্রিভুজের তিনবাহুর অনুপাত = 3:5:6 অনুপাতের রাশিগুলোর যোগফল = $3 + 5 + 6 = 14$

সর্বোচ্চ বাহুর দৈর্ঘ্য = $70 \times \frac{6}{14} = 30$

55. In a club 50% of the male voters and 80% of the female voters voted for candidate A. If candidate A received 70% of the total votes, what is the ratio of male to female voters? PKB, SEO (Cash-18)
- a. $\frac{1}{3}$ b. $\frac{1}{2}$ c. $\frac{1}{4}$ d. $\frac{3}{4}$

Hints:

ধরি, পুরুষ সংখ্যা = x

মহিলা " = y

প্রশ্নমতে, x - এর 50% + y এর 80% = (x + y) এর 70% $\Rightarrow 50x + 80y = 70(x + y) \Rightarrow 50x + 80y = 70x + 70y - 80y$

$\Rightarrow -20x = -10y \Rightarrow -2x = -y \Rightarrow 2x = y \Rightarrow \frac{x}{y} = \frac{1}{2}$

56. Four liters of milk are to be poured into a 2 liter bottle and a 4 liter bottle. If each bottle is to be filled to the same fraction of its capacity, how many liters of milk should be poured into the 4 liter bottle? PKB, SEO (Cash-18)
- a. $\frac{7}{3}$ b. $\frac{2}{3}$ c. $\frac{8}{3}$ d. $\frac{4}{3}$

Hints:

মনে করি, 4 লিটারের বোতলে ভরা হয় = x লিটার

\therefore 2 " " " " = $4 - x$ "

প্রশ্নমতে, $\frac{x}{4} = \frac{4 - x}{2}$ [যেহেতু ভগ্নাংশ সমান]

$\Rightarrow 2x = 16 - 4x \Rightarrow 6x = 16 \Rightarrow x = \frac{16}{6} = \frac{8}{3}$ লিটার

57. One dozen eggs and ten pounds of apples are currently of the same price. If the price of a dozen eggs rises by 10% and that of apples rises by 2%, how much more will it cost to buy a dozen of eggs and ten pounds of apples? PKB, SEO (Cash-18)

a. 2% b. 6% c. 10% d. 12%

Hints:

ধরি, 1 ডজন ডিমের দাম = 100 টাকা
 \therefore 10 পাউন্ড আপেলের " = 100 টাকা
 10% বৃদ্ধির পর ডিমের দাম = 110 টাকা
 2% " " আপেলের " = 102 "
 বৃদ্ধির পর মোট দাম = 110 + 102 = 212 টাকা
 " পূর্বে " " = 100 + 100 = 200 "
 \therefore বৃদ্ধি পায় = 12 টাকা
 \therefore শতকরা বৃদ্ধি পায় = $\frac{12}{200} \times 100\% = 6\%$

58. An iron rod that weighs 24 kg is cut into two pieces so that one of these pieces weighs 16 kg and is 34 m long. If the weight of each piece is proportional to its length, how long is the other piece? PKB, SEO (Cash-18)

Hints:

২য় টুকরার ওজন হবে = 24 - 16 = 8 কেজি
 ধরি, ২য় টুকরার দৈর্ঘ্য = x মি. $16 : 34 = 8 : x \Rightarrow \frac{16}{34} = \frac{8}{x} \Rightarrow x = 17$ মি.

59. The price of a pen is 25% more than the price of a book. The price of a pen holder is 50% more than the price of the book. How much is the price of the pen holder more than the price of the pen? PKB, SEO (Cash-18)

Hints:

ধরি, বই-এর দাম = 100 টাকা
 কলম " " = $100 + 100 \times \frac{25}{100} = 125$ টাকা
 কলম দানি " " = $100 + 100 \times \frac{50}{100} = 150$ টাকা
 \therefore দাম বেশি = 150 - 125 = 25 টাকা \therefore শতকরা = $\frac{25}{125} \times 100 = 20\%$

60. The ratio of two numbers is 3 : 4 and their sum is 630. The smaller one of the two number is- Palli Sanchay Bank (Cash Assistant 2018)

a. 360 b. 270 c. 180 d. 120

Hints:

ধরি, দুটি সংখ্যা যথাক্রমে 3x এবং 4x
 প্রশ্নমতে, $3x + 4x = 630 \Rightarrow 7x = 630 \therefore x = 90$ \therefore ক্ষুদ্রতম সংখ্যাটি হলো, $3x = 3 \times 90 = 270$

61. A batsman scored 110 runs which included 3 boundaries and 8 sixes. What percent of his total score did he make by running between the wickets? Palli Sanchay Bank (Cash Assistant 2018)

ক. ৪২% খ. ৪৫.৪৬% গ. ৫৪.৫% ঘ. ৫৮.৬%

Hints:

৩টি বাউন্ড্রি এবং ৪টি ছক্কায় মোট কৃত রান = $(3 \times ৪ + ৪ \times ৬) = ১২ + ৪৮ = ৬০$
 \therefore দৌড়িয়ে কৃত রানের পরিমাণ = $(১১০ - ৬০) = ৫০$

∴ শতকরা দৌড়িয়ে কৃত রানের পরিমাণ = $\frac{50}{110} \times 100\% = 85.86\%$

62. একটি টাকার খলেতে ১ টাকা, ৫০ পয়সা, ও ২৫ পয়সার মূল্যমানের ৩৪২টি মুদ্রা রয়েছে। মুদ্রাগুলোর মূল্যমানের অনুপাত ১১:৯:৫ হলে ৫০ পয়সা মূল্যমানের মুদ্রার সংখ্যা কয়টি? Jiban Bima Corporation (Junior Officer 2018)
- ক. ৯৯টি খ. ১৮০টি গ. ১৫০টি ঘ. ১৬২টি

[Note: সঠিক উত্তর ১২৬টি]

Hints:

মুদ্রার মূল্যমানের অনুপাত ১১ : ৯ : ৫ অনুপাতের রাশিত্রয় অনুসারে, ১ টাকার মুদ্রার সংখ্যা ১১টি

৫০ পয়সার " " (৯ × ২) টি = ১৮টি

২৫ " " " (৫ × ৪) টি = ২০ টি ∴ ৫০ পয়সার মুদ্রার সংখ্যা $\left(\frac{১৮}{১১ + ১৮ + ২০} \times ৩৪২\right)$ টি = $\left(\frac{১৮}{৪৯} \times ৩৪২\right)$

63. একটি সমবাহু ত্রিভুজের সবগুলো বাহু ২০% বৃদ্ধি পাওয়াতে ত্রিভুজটির ক্ষেত্রফল কত শতাংশ বৃদ্ধি পাবে? Jiban Bima Corporation (Junior Officer-18)
- ক. ৮৮% খ. ৪০% গ. ২০% ঘ. ৮০%

Hints:

সমবাহু ত্রিভুজের ক্ষেত্রফল বৃদ্ধি পায় = $\left(20 + 20 + \frac{20 \times 20}{100}\right)\% = (40 + 4)\% = 44\%$

64. আরিফ ও আকিবের বয়সের অনুপাত 5:3; আরিফের বয়স 20 বছর হলে, কত বছর পর তাদের বয়সের অনুপাত 7:5 হবে? Jiban Bima Corporation (Junior Officer 2018)

- a. 5 বছর b. 6 বছর c. 8 বছর d. 10 বছর

Hints: ধরি, আরিফের বয়স = 5x

আকিবের " = 3x

∴ 5x = 20 ⇒ x = $\frac{20}{5}$ ⇒ x = 4 ∴ আকিবের বয়স = 3 × 4 = 12 বছর

আবার, ∴ 20 + y : 12 + y = 7:5 ⇒ $\frac{20 + y}{12 + y} = \frac{7}{5}$ ⇒ 100 + 5y = 84 + 7y ⇒ 2y = 16 ⇒ y = $\frac{16}{2}$

65. ধানে চাল ও তুষের অনুপাত 7:3 হলে, এতে শতকরা কী পরিমাণ চাল আছে? Jiban Bima Corporation (Junior Officer 2018)

- a. 70 b. 30 c. 7 d. 3

Hints: ধানে চালের পরিমাণ = $\frac{7}{10}$ ∴ চালের পরিমাণের হার = $\frac{7}{10} \times 100\% = 70\%$

66. ভাজক ভাগফলের 10 গুণ, ভাজক 0.5 হলে ভাজ্য কত? Jiban Bima Corporation (Junior Officer 2018)

- a. 0.025 b. 0.25 c. 25 d. 2.5

Hints: ভাজক = 0.5 ∴ ভাগফল = $\frac{0.5}{10} = 0.05$

আমরা জানি, ভাজ্য = ভাজক × ভাগফল = 0.5 × 0.05 = 0.025

67. একটি ক্লাসে 9% শিক্ষার্থী A গ্রেড পেয়েছে। যদি ক্লাসে শিক্ষার্থীর সংখ্যা 300 হয় তবে কতজন শিক্ষার্থী A গ্রেড পেল? Jiban Bima Corporation (Junior Officer 2018)

- a. 21 জন b. 9 জন c. 35 জন d. 28 জন

[Note: সঠিক উত্তর হবে 27 জন।]

Hints: মোট শিক্ষার্থী 100 জন হলে A গ্রেড পায় = 9 জন

" " 1 " " A " " = $\frac{9}{100}$ "

" " 300 " " A " " = $\frac{9 \times 300}{100} = 27$ জন

68. দুটি মেশিন একসাথে ঘণ্টায় 4 টি খেলনা তৈরি করে। 6টি মেশিন 2 ঘণ্টায় কতটি খেলনা তৈরি করবে? Jiban Bima Corporation (Junior Officer-18)

- a. 32 b. 16 c. 12 d. 24

Hints:

2টি মেশিন 1 ঘণ্টায় তৈরি করে 4টি খেলনা
 \therefore 1টি " 1 " " " $\frac{4}{2}$ " "
 \therefore 1টি " 2 " " " $\frac{4 \times 2}{2}$ " "
 \therefore 6টি " 2 " " " $\frac{4}{2 \times 6}$ " " = 24 টি খেলনা।

69. একটি পেন্সিলের দাম 10 টাকা ও একটি কলমের দাম 20 টাকা। যদি মিতার 100 টাকা থাকে, তবে কতগুলো পেন্সিল ও কলম কিনতে পারবে?

Jiban Bima Corporation (Junior Officer 2018)

- a. 6টি পেন্সিল এবং 4টি কলম
 b. 8টি পেন্সিল এবং 2টি কলম
 c. 2টি পেন্সিল এবং 8টি কলম
 d. 4টি পেন্সিল এবং 3টি কলম

Hints:

ধরি, পেন্সিল সংখ্যা x টি এবং কলম সংখ্যা y টি

$$\therefore 10x = 100 - 20y \Rightarrow 10x = 100 - 20y \Rightarrow x = \frac{100 - 20y}{10}$$

এখন, $y = 1$ হলে, $x = \frac{100 - (20 \times 1)}{10} = 8$

$y = 2$ হলে, $x = \frac{100 - (20 \times 2)}{10} = 6$

$y = 3$ হলে, $x = \frac{100 - (20 \times 3)}{10} = 4$ সুতরাং মিতা 4টি পেন্সিল ও 3টি কলম কিনতে পারবে।

70. If an inspector rejects 0.08% of a product as defective, how many units of the product will be examined in order to reject 2? (BSCS, SO 2018)

- a. 1500 b. 500 c. 2000 d. 2500

Solution:

0.08 টি Product reject করেন 100 টি product থেকে

1 " " " " $\frac{100}{0.08}$ " " "

2 " " " " $\frac{100 \times 2}{0.08} = 2500$ টি product থেকে।

বিগত বছরের প্রশ্নপত্র সমাধান

Bangladesh Bank

01. The ration of two numbers is 3 : 4 and their sum is 630. The smaller one of the two numbers is –

BB {AD (General)- 2018}

- A) 360 B) 270 C) 180 D) 120

Hints:

ধরি, একটি সংখ্যা = $3x$ \therefore অপর সংখ্যা = $4x$.

প্রশ্নমতে, $3x + 4x = 63 \Rightarrow 7x = 360 \therefore x = 90$. \therefore ছোট সংখ্যাটি = $3 \times 90 = 270$ (Ans)

02. If the length of a rectangle is increased by 20% and width is decreased by 20% what is the change in area of the rectangle? BB, Officer (General- 18)
 A) unchanged B) decreases by 4% C) increases by 4% D) increases by 5%

Hints:

$$\text{ক্ষেত্রফল পরিবর্তনের হার} \left\{ 20 + (-20) + \frac{20 \times (-20)}{100} \right\} \% = -4\%$$

যেহেতু চিহ্ন (-)ve সেহেতু ক্ষেত্রফল 4% হ্রাস পেয়েছে।

03. If the length of rectangle A is one-half the length of rectangle B, and the width of rectangle A is one-half the width of rectangle B, what is the ratio of the area of rectangle A to the area of rectangle B? BB, Officer (General- 18)
 A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) $\frac{1}{1}$ D) $\frac{2}{1}$

Hints:

ধরি, B এর দৈর্ঘ্য x কক এবং প্রস্থ y একক

$$\therefore A \text{ “ “ } \frac{1}{2} \times \text{ “ এবং প্রস্থ } \frac{1}{2} y \text{ ”}$$

B এর ক্ষেত্রফল xy বর্গএকক

$$A \text{ “ ক্ষেত্রফল } \left(\frac{1}{2} \times \frac{1}{2} y \right) \text{ ”} = \frac{xy}{4} \text{ ” } \therefore A : B = \frac{xy}{4} : xy = 1 : 4 \quad \therefore \frac{A}{B} = \frac{1}{4}$$

04. If 25% of a number is subtracted from a second number, the second number reduces to its five-sixth. What is the ratio of the first number to the second number? BB, AD (GENERAL SIDE-16)
 A) 3:2 B) 1:3 C) 2:3 D) None the these

Hints:

Let, the first number be x and the second number be y

$$\text{Now, } y - \frac{1}{4}x = \frac{5}{6}y \Rightarrow y - \frac{5}{6}y = \frac{1}{4}x \Rightarrow \frac{6y-5y}{6} = \frac{x}{4} \Rightarrow \frac{y}{6} = \frac{x}{4} \quad \therefore \frac{x}{y} = \frac{4}{6} = \frac{2}{3}$$

05. The percentage increase in the area of a rectangle, if each of its sides is increased by 20%, is: BB, AD (GENERAL SIDE-16)
 A) 46% B) 40% C) 42% D) 44%

$$\text{Hints: } +20 + 20 + \frac{20 \times 20}{100} = +44\% \text{ (ans)}$$

06. If 4 (A's capital) = 6 (B's capital) = 10 (C's capital), then out of a profit of Tk 4650, C will receive: BB, OFFICER (CASH-16)

$$\text{Hints: Let, } 4A = 6B = 10C = x \quad \text{Now, } A = \frac{x}{4}; B = \frac{x}{6}; C = \frac{x}{10}$$

$$\therefore A : B : C = \frac{x}{4} : \frac{x}{6} : \frac{x}{10} = \frac{x}{4} \times 60 : \frac{x}{6} \times 60 : \frac{x}{10} \times 60 = 15 : 10 : 6 \quad \therefore \text{Profit of C} = 4650 \times \frac{6}{15 + 10 + 6} = 900 \text{ Tk}$$

07. Two numbers A and B are such that the sum of 5% of A and 4% of B is two-third of the sum of 6% of A and 8% of B) Find the ratio of A:B) BB, OFFICER (CASH-16)
 A) 1:1 B) 3:4 C) 4:3 D) 2:3

Hints:

$$5\% \text{ of A} + 4\% \text{ of B} = (6\% \text{ of A} + 8\% \text{ of B}) \times \frac{2}{3} \Rightarrow .05A + .04B = (.06A + .08B) \times \frac{2}{3}$$

$$\Rightarrow .15A + .12B = .12A + .16B \Rightarrow .03A = .04B \Rightarrow \frac{A}{B} = \frac{.04}{.03} \therefore A:B = 4:3$$

08. If 0.4 of a number is equal to 0.06 of another number, the ratio of the numbers is: BB, OFFICER (CASH-16)
 A) 3:4 B) 3:20 C) 20:3 D) 2:3

Hints: .04 of x = .06 of y $\Rightarrow \frac{x}{y} = \frac{.06}{.4} \Rightarrow \frac{x}{y} = \frac{3}{20} = 3:20 \therefore x:y = 3 : 20$

09. Which of the following fractions is greater than $\frac{3}{4}$ and less than $\frac{5}{6}$? (BB Officer Cash, 2016)
 a. $\frac{2}{3}$ b. $\frac{4}{5}$ c. $\frac{9}{10}$ d. $\frac{1}{2}$

Solution:

$\frac{4}{5}$ is greater than $\frac{3}{4}$ and less than $\frac{5}{6}$

L.C.M of 4, 6, 3, 5, 10, 2 is 60.50, converting all denominator into 60

Now, $\frac{3 \times 15}{4 \times 15} = \frac{45}{60}$; $\frac{5 \times 10}{6 \times 10} = \frac{50}{60}$; $\frac{2 \times 20}{3 \times 20} = \frac{40}{60}$;

$\frac{4 \times 12}{5 \times 12} = \frac{48}{60}$; $\frac{9 \times 6}{10 \times 6} = \frac{54}{60}$; $\frac{1 \times 30}{2 \times 20} = \frac{30}{60}$;

So, we see $\frac{45}{60} < \frac{48}{60} > \frac{50}{60}$