

# Bank Written Math Preparation

## Lec. 02

Algebraic Expressions,  
Factorization, Exponent,  
Single & Double Equation,  
Set Problems

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FOR ADMISSION:  
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1. If  $a + b = 19$  and  $a - b = 11$ , calculate the value of  $a^2 + b^2$  and  $ab$ . (Premier Bank : CO – 2011)

Ans : 241 and 60

2. If  $2x + \frac{2}{x} = 3$ ; then the value of  $x^2 + \frac{1}{x^2}$ . (Shadharon Bima : AM – 2016)

Ans :  $\frac{1}{4}$

3. Given  $x = 3 + \sqrt{8}$ , Find the value of  $x^2 + \frac{1}{x^2}$ . (National Bank : PO – 2015)

Ans : 34

4. If  $x + \frac{1}{x} = 2$ , what is the value of  $\frac{1}{x^2 + x - 1}$ ? (SIB : TO Cash – 2016)

Ans : 1

5.  $\sqrt{x} + \frac{1}{\sqrt{x}} = a$  then find the value of  $x^2 + \frac{1}{x^2}$  (SIB : TSO – 2016)

Ans :  $a^4 - 4a^2 + 2$

6. If  $x = 3 + 2\sqrt{2}$ , then the value of  $\sqrt{x} - \frac{1}{\sqrt{x}}$ . (Janata Bank : AEO – 2017 ; Standard Bank – 2018)

Ans : 2

7. If  $(a + \frac{1}{a})^2 = 3$ , then  $a^3 + \frac{1}{a^3}$  ?

Ans : 0

8. If  $x + \frac{1}{x} = 3$ , then the value of  $x^6 + \frac{1}{x^6}$  (Bangladesh Bank : AD – 2015)

Ans : 322

9. Find the value of  $x^3 + \frac{1}{x^3}$ ; If  $x = \sqrt{3} + \sqrt{2}$ . (Dhaka Bank : TO – 2017)

Ans :  $18\sqrt{3}$

10. If  $x + y + z = 6$  and  $xy + yz + zx = 10$ , then the value of  $x^3 + y^3 + z^3 - 3xyz$  is?

Ans : 36

11. If  $x + \frac{1}{x} = 2$ ; find the value of  $x^{17} + \frac{1}{x^{19}}$  = ? (Janata Bank : AEO – 2020)

Ans : 2

12. If  $\frac{x^{24} + 1}{x^{12}} = 7$ , then the value of  $\frac{x^{72} + 1}{x^{36}}$  is – (Janata & Rupali Bank : Officer – 2020)

Ans : 322

13. If  $x^2 + \frac{1}{x^2} = 7$ , then the value of  $x^{102} + x^{96} + x^{90} + x^{84} + x^{78} + x^{72} + 5$  (Janata : AEO – 2020)

Ans : 5

14.  $\sqrt[3]{8x^2 \sqrt{32x \sqrt{4x^2}}} = 4$ , then the value of  $x$ ?

(Premier Bank : MTO – 2012 ; RAKUB : SO – 2014 ; IFIC Bank : Officer Cash – 2013)

Ans : 1

15. If  $2x = 4y = 8z$  and  $\frac{1}{2x} + \frac{1}{4y} + \frac{1}{4z} = 4$ , then find the value of  $x$ . (UCBL : Officer – 2010)

Ans :  $\frac{1}{2}$

16. Factorize :  $4t^2 + 35t - 9$  (Dhaka Bank : MTO – 2018)

Ans :  $(t + 9)(4t - 1)$

17. Resolve into factor :  $a^2 + \frac{1}{a^2} + 2 - 2a - \frac{2}{a}$  (BKB : Cash – 2018)

Ans :  $(a + \frac{1}{a})(a + \frac{1}{a} - 2)$

18. If  $a = xy^{p-1}$ ,  $b = xy^{q-1}$ ,  $c = xy^{r-1}$  and  $p + q + r = 3$ , then prove that  $a^{q-r} \cdot b^{r-p} \cdot c^{p-q} = 1$ . (Agrani Bank : Cash – 2018)

19. If  $2^a + 3^b = 17$  and  $2^{a+2} - 3^{b+1} = 5$ , then determine the values of a and b. (SJIB : TSO – 2007)

Ans :  $a = 3$  and  $b = 2$

20. Solve the following equation:  $\frac{2}{x-2} + \frac{3}{x+3} = 1$  (One Bank : PO – 2007 ; SIBL : TO – 2010)

Ans :  $x = 2 \pm \sqrt{10}$

21. Solve:  $\frac{x}{2} + \frac{6}{y} = 9$ ,  $\frac{x}{3} + \frac{2}{y} = 4$  (BDBL : SO – 2018)

Ans :  $x = 6$  and  $y = 1$

22. Proof of identity of 115 people was verified. 65 of them had passport, 30 of them had passport and voter ID. However, 15 of them could not produce any document. How many of them showed up only voter ID?

(BKB : Officer - 2017)

Ans : 35

23. In an examination, 80% of the students passed in English, 85% in Mathematics, and 75% in both English and Mathematics. If 40 students failed in both the subjects, find the total number of students? (PKB : CO - 2014)

Ans : 400

24. In a party attended by 32 people, 24 of them were students. If 12 of them were women, and if 6 of the women were students, how many of the men who attended the party were not students? (Mercantile Bank - 2004)

Ans : 2

25. In a survey at an airport, 55 travelers said that last year they had been to Spain, 53 to France and 79 to Germany. 18 had been to Spain and France, 17 to Spain and Germany and 25 to France and Germany, while 10 had been to all three countries. How many travelers took part in the survey? (Agrani Bank – 2018 ; Rupali Bank – 2018)

Ans : 137

26. A total of 50 employees work in a bank branch of these 22 have taken the accounting course, 15 have taken finance, 14 marketing, 9 of them have taken exactly 2 of the courses, 1 of them has taken all. How many of the 50 employees have taken none of the course? (Dhaka Bank – 2004 ; Premier Bank – 2003; Bangladesh Bank : AD - 2001)

Ans : 10

### Questions for Practice

27. If  $p - \frac{1}{p} = 8$ , find the value  $p^2 + \frac{1}{p^2} = ?$

Ans : 66

28. Find the value of  $x^4 + \frac{1}{x^4}$ , if  $x = \sqrt{5} - \sqrt{4}$  (Janata Bank – 2015 ; Dhaka Bank – 2017)

Ans : 322

29. If  $a - \frac{1}{a} = 3$ , then  $a^2 + \frac{1}{a^2} = ?$  (Agrani Bank : SO – 1992)

Ans : 11

30. If  $x^3 + \frac{3}{x} = 4(a^3 + b^3)$ ; and  $3x + \frac{1}{x^3} = 4(a^3 - b^3)$ , then the value of  $a^2 - b^2 = ?$  (PKB – 2019)

Ans : 1

31. If  $a^2 - \sqrt{3a} + 1 = 0$ , what is the value of  $a^3 + \frac{1}{a^3}$ ? (Rupali Bank : SO – 2013)

Ans: 0

32. If  $x + \frac{2}{x} = 1$ , then the value of  $\frac{x^2+x+2}{x^2(1-x)}$  (Rupali Bank : SO – 2019)

Ans : 1

33.  $\frac{2^{n+4} - 2 \times 2^n}{2 \times 2^{n+3}} + 2^{-3}$  equal to = ?

Ans : 1

34. If  $2^{n-1} + 2^{n+1} = 320$ , then the value of n is = ? (Bangladesh Bank : Officer – 2019)

Ans : 7

35. Solve the equation:  $\frac{8}{2x-1} + \frac{9}{3x-1} = \frac{7}{x+1}$  (NRBC : MTO – 2018 ; National Bank : PO - 2017)

Ans :  $\frac{2}{x5}$

36.  $\frac{x-4}{x-1} + \frac{x-7}{x-3} + \frac{x-2}{x-9} = 3$  (Bank Asia : MTO – 2017)

Ans : 2

37. Factorize :  $x^2 + ax - (3a - 2)(4a - 2)$  (Karmashangsthan Bank : Officer – 2011)

Ans :  $(x - 3a + 2)(x + 4a - 2)$

38. A ninth grade humanities section of a school consist of 50 students, among them 29 students take civics, 24 students take Geography and 11 students take both civics as well as Geography, how many of the student have taken neither civics nor geography?

Ans : 8

39. In an exam, 88% of the students passed in Mathematics and 87% passed in English. If none of the students failed in both subjects and 225 passed in both subjects, calculate the number of students who have attended the exam.

(City Bank : Officer – 2001 ; Pubali Bank : So – 2010)

Ans : 300

40. In a class of 40 students, each student plays at least one of the games: chess, carom and table tennis. Among the students, 18 play chess, 20 play table tennis and 27 play carom. Further, 7 students play both chess and table tennis, 12 play both table tennis and carom and 4 play chess, carom and table tennis together. Find the number of students who play chess and carom but not table tennis. (Janala Bank : AEO – 2017)

Ans : 6