Group A

1. Present population of a city is 50 lac. The growth rate of population of that city is 30 per thousand.
   a) What do you understand by compound profit?   2
   b) How many people of that city will increase after 3 years?   4
   c) If the growth rate of population is unchanged, what will be the (approximate) total population after the following next 2 years?   4

2. To meet an urgent family need, shale takes a loan of taka 'x' at the rate of 5% interest and taka 'y' at 4% interest. She takes in total taka 56,000 as a loan and pays Tk. 2,840 as interest.
   a) What will be annual interest if 5% interest is imposed on total loan?   2
   b) Find out the value of x and y.   4
   c) How much interest will be paid by shale if 5% compound interest is imposed for 2 years?   4

3. The profit-principal of some principal is Tk. 7700 in 3 years. If the profit is $\frac{3}{8}$ part of the principal.
   a) A commodity is sold for Tk. 475 at the loss of 5%. What is the cost price of the commodity? 2
   b) Find the rate of profit and principal.   4
   c) At 10% profit, considering the above profit-principal as principal determine the compound profit for 3 years and 6 months.

Group B

4. if $x+\frac{1}{x}$, $x^3+\frac{1}{x^3}$ and $x^4+\frac{1}{x^4}$ are three algebraic expression-
   a) if $x = \sqrt{2}+\sqrt{3}$ find the value of 1st exp.   2
   b) If $x+\frac{1}{x}=2\sqrt{2}$, then find the value 2nd exp.   4
   c) When $x-\frac{1}{x}=3$, determine the value of 3rd exp.   4

5. m^2-9, $m^2+7m+12$ and m^3-27 are three algebraic expressions.
   a) Resolve into factors of 1st and 2nd expression.   2
   b) Express 2nd expression as the difference of the square of two expressions.   4
   c) Find the L.C.M of three expressions.   4

6. A=$x+\frac{1}{x}$, B=18(x^2-3x), C=24(x^2-9), D=32(x^2-4x+3) are four algebraic expressions.
   a) Find the cube of (x y + y z).   2
   b) If A=$\sqrt{6}$, then prove that, $\frac{x^6-1}{x^3}=5\sqrt{2}$ 4
   c) Find the H.C.F of B, C and D.   4

Group C
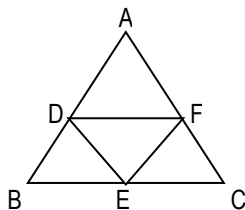
7. a) Find the values of $\angle EBD + \angle BDE + \angle BED$ and $\angle EDF + \angle DFE + \angle FED$?   2
   b) If D and F are the mid-points of AB and AC respectively. Prove that, DF ll BC and DF=$\frac{1}{2}$ BC.   4
   c) If $\triangle$ABC is equilateral D, E and F are the mid-points AB, BC and AC respectively. Prove that BEFD is a rhombus.   4

8. If PQRS is a parallelogram.
   a) Constructing the transversal PR and QS, write the alternate angles produced by them.   2
   b) Prove that, in parallelogram PQRS the opposite sides and angles are equal.   4

c) If the two diagonals PR and QS intersect at O, prove that, PO=RO and QO=SO.   4

9.   The length of three sides a=4 cm, b=5 cm, c=6 cm and the two adjacent angles of the largest

   sides are $\angle x = 70°°$ and $\angle y =85°$.

a) If a is the side of a square construct the square.   2

b) Using stem construct the quadrilateral. [The sign of construction and description are essential].   4

c) Considering the two larger sides of stem as two adjacent sides of a rectangle, construct the rectangle. [The sign of construction and description are essential]   4

Group D

10 .Daily savings of 50 students are given below:

Savings (in Tk)	41-50	51-60	61-70	71-80	81-90	91-100
Frequency	4	11	8	14	5	8

a). Find the mid value of the class 61-70.   2

b) Find the arithmetic mean from the table.   4

c) Draw a histogram the frequency distribution table.   4

11.   Marks obtained in mathematics by 25 students of class VIII are: 45, 42, 60, 61, 58, 53, 48,

52, 51, 49, 73, 52, 57 , 71, 64, 49, 56, 48, 67, 63, 70, 59, 54, 46, 43.

a) What do you mean by Class interval?   2

b) Make a frequency distribution table and from the table find arithmetic mean taking 5 as class interval.4

c) Draw a histogram of the given data.   4

1. At the simple interest of 10% for take 800, in how many years the profit will be Take 160?
   a) 1   b) 2   c) 3   d) 4
2. Follow the below information-
   i. $(a+b)^2 = (a-b)^2$
   ii. $(a+b)^2 = (a-b)^2 + 4ab$
   iii. $(a^3 - b^3) = (a-b)^3 + 3ab(a-b)$
   Which one is correct?
   a) i, ii   b) i, iii   c) ii, iii   d) i ,ii, iii

   According to the following information answer to the questions No. 3 and 4. $(x + \frac{1}{x}) = \sqrt{7}$

3. What is the value of $\left(x - \frac{1}{x}\right)$?
   a) $\sqrt{3}$ b) $\sqrt{7}$ c) $\sqrt{11}$ d) 7
4. Which one of the following is the value of $x^2 + \frac{1}{x^2}$?
   a) 3   b) 5   c) 7   d) 9
5. i. If four data are given, rectangle can be drawn
   ii. If three sides and two angles are given, a quadrilateral can be drawn.
   iii. If a side of a square is given, the square can be drawn
   Which one of the following is correct in view of the above information?
   a) i and ii   b) i and iii   c) ii and iii   d) i, ii and iii

   Answer the question no. 6 and 7 in the light of information below: Mr Tony paid Tk 1080 for the the electricity bill for the month of March. A VAT at the rate 15% on the amount of the electricity bill is fixed.
6. What will be profit-principal after two years?
   a) 162   b) 324   c) 1080   d) 1404
7. In how many years the above principal will be doubled as profit principal at the rate of 5% ?
   a) 4   b) 10   c) 20   d) 40
8. What is the H,C, F of $a^3b^2c^3, a^5b^3c^4$ and $a^3b^2c^2$?
   a) $a^3b^2c^2$ b) $a^4b^2c^2$ c) $a^5b^3c^4$ d) $a^5b^2c^4$.
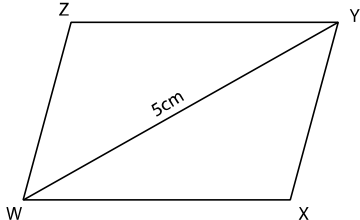
In the figure WXYZ is a parallelogram and semi-perimeter of $\triangle XYZ$ is 6cm.
9. WZ + ZY = how many centimeters?
   a) 6   b) 7   c) 11   d) 12

10. If $\left(x - \frac{8}{x}\right) = 5$, what is the value of?. $x^2 - 5x$
    a) 5   b) 8   c) 25   d) 64

Answer the following questions (11, 12) from the bellow data.

Class Interval	5- 9	10-14	15-19	20-24
Frequency	10	20	4	6

11. What is the class interval of above data?
    a) 3   b) 4   c) 5   d) 12
12. What is the class mid value of 3rd class?
    a) 17   b) 17.5   c) 34   d) 4
13. The three sides of a triangle are 3cm, 4cm, 5cm.
    i. The triangle is acute angled triangle.
    ii. The sum of two sides is greater than the third side.
    iii. The perimeter of the triangle is 12cm.
    Which one is correct?
    a) i ,ii   b) i, iii   c) ii, iii   d) i, ii, iii
14. Which one of the following expression is the factors of $x^2 - 10x + 21$
    a) (x-3)(x-7)   b) (x+7)(x-3)   c) (x+7)(x+3)   d) (x-7)(x+3)
15. What is the number of proper subsets of the set A= {2, 3, 4, 5 }?
    a) 16   b) 15   c) 8   d) 4
16. . Which one of the following defines a class interval?
    a) The difference between first and last data.
    b) The sum of last and first data.
    c) The sum of largest and smallest data.
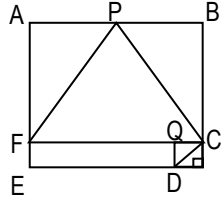   d) Difference between highest and lowest numbers of each class.

Answer the following questions no. 17, 18,19and 20.

In the polygon ABCDE

AE ll BC, CF $\perp$ AE, DQ $\perp$ CF

ED=10mm, EF=2 mm

BC=8mm, AB=12mm

17. What is the area of ABCF in sq. mm?

   a) 64   b) 96   c) 100   d) 144

18. Which one of the following indicates the area of ΔFPC in sq. mm?

   a) 32   b) 48   c) 72   d) 60

19. Which one of the following expresses the length of CD in mm?

   a) $2\sqrt{2}$ b) 4   c) $4\sqrt{2}$ d) 8

20. Which one indicates the difference between the areas of ΔFPC and ΔDCQ in sq. mm?

   a) 46   b) 48   c) 50   d) 52

21. The profit of a principal in 5 years is half of the principal .What is the rate of profit?

   a) 12   b) 11   c) 10   d) 9

22. Read the following information attentively

i. Sum of four angles of a quadrilateral is 360º.

ii. If the adjacent sides of a rectangle are equal, and no angles equal to 90º it is a rhombus.

iii. All rhombuses are parallelogram.

Which one of the following is correct?

   a) i ,ii   b) i, iii   c) ii, iii   d) i, ii, iii

Answer to the question no 23 and 24 based on the following information.
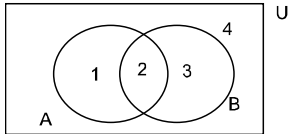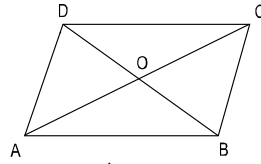

23. Which one is correct for (A $\bigcap$ B)?

a). {2}   b) {1, 3}   c) {1, 2, 3}   d) {1, 2, 3, 4}

24. Which one is correct for $A^{/}$?

   a) {3, 4}   b) {1, 4}   c) {1, 3}   d) {1, 2}

25. Range=what?

a) (Highest value - lowest value)+1 b) (Highest value + lowest value)-1

c) Highest value - lowest value d) (Highest value $\times$ lowest value)+1

26. In the above figure, if $\angle$ BAD=75º, which one is the value of $\angle$ADC?

   a) 90°   b) 100°   c) 105°   d) 180°

27. If ABCD is a quadrilateral and diagonal AC=diagonal BD. which one of the following is correct? (AB=AD)

   a) Rhombus   b) Parallelogram

   c) Rectangle   d) Square

28. The formula of compound profit is ---

   a) C= P $(1+r)^{n}$ b)   C= P$(1+n)^{r}$

   c) C= P $(1+r)^{n}$ - P   d) C= P+A

29. If a+b=14 and a-b=5,

i. $a^{2}-b^{2}=60$

ii. $2(a^{2}+b^{2})= 221$

iii. 4ab=171

Which one of the following is correct?

a) i and ii   b) i and iii   c) ii and iii   d) i, ii and iii

30. What is the sum of 10% of x and 20% of y?

   a) $\dfrac{x}{10}+\dfrac{y}{5}$ b) $\dfrac{10}{x}+\dfrac{5}{y}$

   c) $\dfrac{x}{10}\times\dfrac{y}{5}$ d) $\dfrac{x}{10}\div\dfrac{y}{5}$