



Special Model Tests with Answers

as per NCTB provided question pattern, assessment guidelines & marks distribution



Model Test 01

Time : 3 hours

Half-Yearly Exam

Mathematics Class : Eight

Full marks : 100

$1 \times 30 = 30$

[N.B. : Answer all the questions. Each question carries one mark. Block fully, with a ball-point pen, the circle of the letter that stands for the correct/best answer in the "Answer Sheet" for Multiple Choice Question Type Examination.]

1. What is the next number in the pattern of 1, 3, 4, 7, 11,?
Ⓐ 15 Ⓑ 18 Ⓒ 16 Ⓓ 21
 2. What is the sum of the first six odd numbers?
Ⓐ 42 Ⓑ 36 Ⓒ 30 Ⓓ 25
 3. Which one of the following is a pattern of Fibonacci number?
Ⓐ 0, 2, 2, 4, 6 Ⓑ 0, 1, 1, 3, 5
Ⓒ 0, 1, 1, 2, 4 Ⓓ 0, 1, 2, 3, 4
 4. Which numbers are Fibonacci numbers in the following?
Ⓐ 0, 1, 1, 2, 3, Ⓑ 0, 0, 1, 2, 3,
Ⓒ 0, 1, 2, 3, 4, Ⓓ 0, 2, 4, 6, 8,
 5. Which one of the following is a pattern of Fibonacci number?
Ⓐ 0, 0, 1, 2, 3 Ⓑ 0, 1, 2, 3, 4
Ⓒ 0, 1, 2, 4, 6 Ⓓ 0, 1, 1, 2, 3
 6. The selling price is Tk 480 at the profit of 20%. What is the cost price?
Ⓐ Tk 100 Ⓑ Tk 120 Ⓒ Tk 400 Ⓓ Tk 460
 7. The cost price of something is 3 pieces at Tk 1. A shirt is sold Tk. 850 at the loss of 15%. Which one of the following is the cost price of the shirt?
Ⓐ Tk. 800 Ⓑ Tk. 1000
Ⓒ Tk. 1100 Ⓓ Tk. 1250
 8. Which one of the following is 150% of Tk. 50?
Ⓐ 50 Ⓑ 75 Ⓒ 100 Ⓓ 150
 9. Which is the 5% of Tk. 1200?
Ⓐ Tk. 60 Ⓑ Tk. 6 Ⓒ Tk. 50 Ⓓ Tk. 5
 10. If a pencil is sold at Tk 11, there is a profit 10%. What was the cost price of the pencil?
Ⓐ Tk 1 Ⓑ Tk 10 Ⓒ Tk 12 Ⓓ Tk 21
- Answer questions from 11 and 12 :
An orange seller bought 100 oranges for Tk. 1250 and sold it at Tk. 1500.
11. What was the cost price per four orange?
Ⓐ Tk. 45 Ⓑ Tk. 50 Ⓒ Tk. 55 Ⓓ Tk. 60
 12. What is the profit per orange?
Ⓐ Tk. 3.00 Ⓑ Tk. 2.50 Ⓒ Tk. 3.25 Ⓓ Tk. 2.75
 13. If $x - \frac{1}{x} = 2$, what is the value of $(x^2 + \frac{1}{x^2})$?
Ⓐ 10 Ⓑ 8 Ⓒ 4 Ⓓ 6
 14. What is the value of $36x^2 - 48xy + 16y^2$, when $x = 3$ and $y = 2$?
Ⓐ 100 Ⓑ 110 Ⓒ 120 Ⓓ 140
 15. If $x + y = 6$ and $x - y = 4$, what is the value of $5xy$?
Ⓐ 16 Ⓑ 24 Ⓒ 25 Ⓓ 36
 16. If $a^2 - 3a - 1 = 0$, then $a^2 + \frac{1}{a^2} = ?$
Ⓐ 5 Ⓑ 7 Ⓒ 11 Ⓓ 13

17. If $x - \frac{1}{x} = 6$, what is the value of $(x + \frac{1}{x})^2$?
Ⓐ 32 Ⓑ 40 Ⓒ 38 Ⓓ 44
 18. If $x + y = 5$ and $x - y = 3$, then —.
i. $x^2 - y^2 = 15$
ii. $x^2 + y^2 = 17$
iii. $xy = 34$
Which one is correct?
Ⓐ i & ii Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii
 19. Which one set of four angles should be the angles of a quadrilateral?
Ⓐ $90^\circ, 90^\circ, 60^\circ$ and 20° Ⓑ $110^\circ, 90^\circ, 70^\circ$ and 70°
Ⓒ $80^\circ, 80^\circ, 100^\circ$ and 90° Ⓓ $90^\circ, 70^\circ, 110^\circ$ and 90°
 20. What is the total of four angles of a kite?
Ⓐ 360° Ⓑ 300° Ⓒ 180° Ⓓ 90°
 21. To construct a quadrilateral how many unique data are required?
Ⓐ 3 Ⓑ 4 Ⓒ 5 Ⓓ 6
 22. What is called the quadrilateral region whose two pairs of adjacent sides are equal?
Ⓐ Rectangular region Ⓑ Square region
Ⓒ Kite Ⓓ Trapezium
 23. How many data are to be known to draw a quadrilateral?
Ⓐ Two Ⓑ Three Ⓒ Four Ⓓ Five
 24. A quadrilateral with exactly two distinct consecutive pairs of sides of equal lengths is —.
Ⓐ rectangle Ⓑ parallelogram
Ⓒ trapezium Ⓓ kite
 25. If the height of a trapezium is 6 cm. and the lengths of the parallel sides are 8 cm. and 7 cm. respectively, what is its area in sq. cm?
Ⓐ 45 Ⓑ 90 Ⓒ 168 Ⓓ 180
 26. If $\angle A = 120^\circ$, $\angle C = ?$
Ⓐ 45° Ⓑ 60° Ⓒ 90° Ⓓ 120°
 27. How many information must be included in a data?
Ⓐ 10 Ⓑ 5
Ⓒ 3 Ⓓ More than one or some
 28. If range is 57 and class interval is 10, what is number of classes?
Ⓐ 5 Ⓑ 6 Ⓒ 7 Ⓓ 8
- Answer the questions No. 29 and 30 in the light of the frequency distribution table given below :
- | Class interval | 41-50 | 51-60 | 61-70 | 71-80 |
|----------------|-------|-------|-------|-------|
| Frequency | 8 | 13 | 10 | 6 |
29. Which is the class-interval?
Ⓐ 5 Ⓑ 9 Ⓒ 10 Ⓓ 40
 30. What is the Mid-value of the 2nd class?
Ⓐ 45.5 Ⓑ 55 Ⓒ 55.5 Ⓓ 65.5

Short-Answer Question (Each question carries 2 marks)**Answer any 10 of the following questions :**

1. Find the next two numbers from the following list of numbers: 6, 12, 24, 48, 96, ...
 2. What is Fibonacci Pattern? Give example.
 3. 0, 1, 1, 2, 3, 5, What is the pattern known as and why?
 4. What does investment mean? What does profit or loss depend on?
 5. Selling a watch for Tk 856 makes a profit of 7%. What is the cost price of that watch?
 6. If a product is bought for Tk 60 and sold for Tk 50, what percentage profit or loss will be?
 7. Resolve into factors : $p^4 + p^2 + 1$.
 8. Resolve into factors : $x^3 - 3x^2y + 3xy^2 - 9y^3$
 9. If a factor of $a^3 - 1$ is $a - 1$, what is the another?
 10. Write four characteristics of a triangle related to angles.
 11. Define the exterior angle of a triangle with a diagram.
 12. What is an interior angle of a triangle?
 13. Find the range of the numbers 7, 5, 14, 13, 10, 8, 9, 11, 12, 6.
 14. What is class number? Write the formula for determining the class number.
 15. What is a histogram?

 $2 \times 10 = 20$ **Creative Question** (Each question carries 10 marks)**Answer any 5 of the following questions taking at least 1 question from each group :** $10 \times 5 = 50$ **Group- A : Arithmetic**

1. (i) 3, 8, 13, 18,
 (ii) 7, 18, 29, 40, are two patterns of natural number.
 a. By finding the value of 11th term of algebraic expression $(a^2 - 4)$ expresses it as the sum of two squares. 2
 b. Which algebraic expression is followed by pattern (i), present it with logic. 4
 c. Find the sum of the first 51 numbers of pattern (ii). 4
 2. At the rate of 10% per annum Tk 25,000 deposited in bank.
 a. Find the profit-principal for two years. 2
 b. Find the difference of simple profit and compound profit in 3 years. 4
 c. At the same rate of interest how many years will it be 2.5 times of it as profit-principal? 4

Group- B : Algebra

3. $x + \frac{1}{x} = 5$, where $x \neq 0$ and $P = 4a^2 - 1$, $Q = 2a^2 + 3a - 2$, $R = 6a^2 - a - 1$.
 a. Find the square of $(-x^3 + 2)$. 2
 b. Prove that, $x^3 - \frac{1}{x^3} = 24\sqrt{21}$. 4
 c. Find the H.C.F. of P, Q and R. 4
 4. $P = a^2 - 7a + 6$, $Q = a^2 - 2a + 1$, $R = a^2 - 5a + 4$ and $S = ax^2 + (a^2 - 1)x - a$ are four algebraic expressions.
 a. Resolve into factors of S. 2
 b. Determine $a^3 - \frac{1}{a^3}$, if $Q = 2$. 4
 c. Find the H.C.F. of P, Q, R. 4

Group- C : Geometry

5. Consider line segments $a = 6\text{cm}$, $b = 4\text{cm}$ and $\angle X = 30^\circ$, $\angle Y = 60^\circ$.
 a. Construct $\angle Y$ with pencil compass. 2
 b. Construct a triangle with sides 'a' and 'b' and their including angle $\angle Y$. [Sign and description of construction is must] 4
 c. Construct a triangle with sides 'a' and its adjoining angles $\angle X$ and $\angle Y$. [Sign and description of construction is must] 4
 6. At ΔABC and ΔDEF $AB = DE$, $AC = EF$ and Included $\angle BAC =$ Included $\angle EDF$.
 a. Draw the figure according to the information. 2
 b. Prove that, $\Delta ABC \cong \Delta DEF$ 4
 c. If $\angle B = \angle E$, $\angle C = \angle F$ and $BC = EF$, then prove that two triangles are congruent 4

Group- D : Data & Information

7. The secured marks in Mathematics of 15 students of class six in S. H. Khan School are : 95, 62, 87, 32, 59, 92, 82, 66, 75, 99, 44, 37, 58, 51, 62.
 a. Is the data an organized data? Bring the data in an organized form. 2
 b. Determine arithmetic mean of the data. 4
 c. Find median and mode of the data. 4
 8. The frequency distribution table of the marks obtained in Mathematics by 60 students of class VIII is given :

Marks obtained	41-45	46-50	51-55	56-60	61-65	66-70
Frequency	6	9	15	12	10	8

- a. Determine the mid value of mode class. 2
 b. Determine the mean. 4
 c. Draw the histogram of given data. 4

Answer Sheet ▶ Multiple Choice Questions

1	B	2	B	3	A	4	A	5	D	6	C	7	B	8	D	9	A	10	B	11	B	12	B	13	D	14	A	15	C
16	C	17	D	18	A	19	D	20	A	21	C	22	B	23	D	24	D	25	A	26	D	27	D	28	B	29	C	30	C

Solving Reference ▶ Short-Answer Questions

- 1 ▶ See Page 11; Ques. 03 5 ▶ See Page 39; Ques. 04 9 ▶ See Page 120; Ques. 11 13 ▶ See Page 392; Ques. 09
 2 ▶ See Page 11; Ques. 10 6 ▶ See Page 39; Ques. 05 10 ▶ See Page 298; Ques. 06 14 ▶ See Page 392; Ques. 11
 3 ▶ See Page 11; Ques. 11 7 ▶ See Page 120; Ques. 04 11 ▶ See Page 298; Ques. 10 15 ▶ See Page 392; Ques. 18
 4 ▶ See Page 39; Ques. 01 8 ▶ See Page 120; Ques. 09 12 ▶ See Page 298; Ques. 12

Solving Reference ▶ Short-Answer Questions

- 1 ▶ See Page 16; Ques. 04 3 ▶ See Page 131; Ques. 02 5 ▶ See Page 305; Ques. 03 7 ▶ See Page 397; Ques. 01
 2 ▶ See Page 53; Ques. 05 4 ▶ See Page 132; Ques. 05 6 ▶ See Page 305; Ques. 04 8 ▶ See Page 398; Ques. 04



Model Test 02

Time : 3 hours

Half-Yearly Exam

Mathematics ◊ Class : Eight

Full marks : 100

Multiple Choice Questions (Each question carries 1 mark)

 $1 \times 30 = 30$

[N.B. : Answer all the questions. Each question carries one mark. Block fully, with a ball-point pen, the circle of the letter that stands for the correct/best answer in the "Answer Sheet" for Multiple Choice Question Type Examination.]

1. If the algebraic expression of a pattern is $a^2 - 1$, which one of the following is 4th term?
Ⓐ 7 Ⓑ 15 Ⓒ 17 Ⓓ 24
2. Which one of the following number cannot be expressed as the sum of two numbers square?
Ⓐ 10 Ⓑ 13 Ⓒ 16 Ⓓ 50
3. Which one is the expression of the following pattern?
0, 3, 8, 15, 24,.....?
Ⓐ $2n^2 - 1$ Ⓑ $2n^2 + 1$ Ⓒ $n^2 - 1$ Ⓓ $n^2 + 1$
4. $n^2 - 1 = 24$, then what is the value of n?
Ⓐ 3 Ⓑ 4 Ⓒ 5 Ⓓ 6
5. For algebraic expression $(A^2 - 1)$ —
 - i. 1st term is zero
 - ii. The sum of first 4 numbers is 26
 - iii. The difference of consecutive two terms is 5
 Which one is correct?
Ⓐ i & ii Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii
6. To form a 3-order magic square, which number will be set in the small square in the centre.
Ⓐ 1 Ⓑ 3 Ⓒ 5 Ⓓ 7
7. Which one of the following is 10% of Tk. 1050?
Ⓐ Tk. 10500 Ⓑ Tk. 1050
Ⓒ Tk. 105 Ⓓ Tk. 10.50
8. 15% of Tk. 3000 = what?
Ⓐ Tk. 450 Ⓑ Tk. 300 Ⓒ Tk. 200 Ⓓ Tk. 150
9. If the principal is P and r is the percentage of profit per annum, then what will be the compound principal after 3 years?
Ⓐ $P + (1 + r)^3$ Ⓑ $P + (1 + r)^2$
Ⓒ $P(1 + r)^3$ Ⓓ $(P + r)^3$
10. What will be the percentage of loss or profit if 4 things are bought per taka : and sold 5 things per taka?
Ⓐ Tk. 40 Ⓑ Tk. 10 Ⓒ Tk. 30 Ⓓ Tk. 20
11. If the rate of profit is 12%, which is the compound principal of Tk. 30000 in 2 years?
Ⓐ Tk. 37632 Ⓑ Tk. 37332
Ⓒ Tk. 37300 Ⓓ Tk. 35632
12. What is the compound principal of Tk. 10,000 in 2 years at the rate of 5% per annum?
Ⓐ Tk. 11,520 Ⓑ Tk. 11025
Ⓒ Tk. 1102.50 Ⓓ Tk. 11250
- Answer the questions No. 13 and 14 with the help of the given information:-
Mr. Karim deposited Tk. 2,000 in a bank in 2 years at a rate of 10% profit.
13. Which is the simple profit?
Ⓐ Tk. 400 Ⓑ Tk. 420 Ⓒ Tk. 450 Ⓓ Tk. 460
14. Which is the difference of compound profit and simple profit?
Ⓐ Tk. 420 Ⓑ Tk. 400 Ⓒ Tk. 42 Ⓓ Tk. 20

15. What is the value of $\frac{y}{y+1} - \frac{y}{1-y}$?
Ⓐ $\frac{2y}{1-y^2}$ Ⓑ $\frac{2y}{y^2-1}$ Ⓒ $\frac{-2y^2}{y^2-1}$ Ⓓ $\frac{-2y^2}{1-y^2}$
16. If $4x - 3 = 5$, what is the value of $64x^3 - 27 - 180x$?
Ⓐ 25 Ⓑ 125 Ⓒ 140 Ⓓ 305
17. If $a + b = 4$ and $a - b = 2$, then $a^3 - b^3 = ?$
Ⓐ 27 Ⓑ 26 Ⓒ 8 Ⓓ 1
18. Which one of the following is the value of $(x + 3y)(x^2 - 3xy + 9y^2)$ if $x = 4$ & $y = 1$?
Ⓐ 91 Ⓑ 47 Ⓒ 37 Ⓓ 27
19. The lengths of two diagonals of a rhombus are 8 cm and 9 cm. What is the area of rhombus?
Ⓐ 144 sq. cm. Ⓑ 72 sq. cm.
Ⓒ 36 sq. cm. Ⓓ 34 sq. cm.
20. What is the area of rectangle ABCD When AB = 18m and AD = 10m?
Ⓐ 60 sq. m. Ⓑ 100 sq. m.
Ⓒ 180 sq. m. Ⓓ 360 sq. m.
21. To construct a quadrilateral how many unique data are required?
Ⓐ 6 Ⓑ 5 Ⓒ 4 Ⓓ 3
22. A quadrilateral is possible to construct if—
 - i. three sides and two included angles
 - ii. four sides and a diagonal
 - iii. three sides and two diagonals
 Which one of the following is correct?
Ⓐ i & ii Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii
23. The number of tally marks in a class is called—
Ⓐ Frequency Ⓑ Class mid-value
Ⓒ Range of class Ⓓ Class interval
24. If the highest value of the data is 60, lowest value is 20 and class interval is 5 then which one is the number of class?
Ⓐ 8 Ⓑ 9 Ⓒ 40 Ⓓ 41
25. What kind of data are 30, 45, 40, 36, 42, 36, 33, 42 of the ages of 8 people?
Ⓐ Organized Ⓑ Disorganized
Ⓒ Tally data Ⓓ Class data
26. If the highest value and lowest value of a data are 50 and 15 respectively, what is its range?
Ⓐ 30 Ⓑ 35 Ⓒ 36 Ⓓ 37
27. How many degree is found in the centre of pie-chart?
Ⓐ 90° Ⓑ 180° Ⓒ 270° Ⓓ 360°
28. How many degree is found in the centre of pie-chart?
Ⓐ 90° Ⓑ 180° Ⓒ 270° Ⓓ 360°
29. What is the another name of pie-chart?
Ⓐ Circular diagram Ⓑ Section area of circle
Ⓒ Histogram Ⓓ Circle distribution
30. What is the mean of the numbers 8, 12, 16, 17, 20?
Ⓐ 10.5 Ⓑ 12.5 Ⓒ 13.6 Ⓓ 14.6

Short-Answer Question (Each question carries 2 marks)**Answer any 10 of the following questions :**

1. Express 25 and 34 as the sum of two squares.
2. Express 20 as the difference of two squares and 41 as the sum of two squares.
3. Express 265 in two different ways as the sum of the squares of two natural numbers.
4. Write two formulas for determining compound principal and compound profit with explanation of symbols.
5. Find the compounded profit of Tk 10000 in 5 years at 9%.
6. What is the difference between the simple and compound profits of Tk 3000 in 3 years at the rate of 5%?
7. Find the H.C.F. of $2x^3y^2z^2$, $12x^2yz$ and $20xy^3z^3$.
8. Find the L.C.M. of $4ab^2x^3$, $9a^3c$ and $12a^3bc^4x^4$.
9. Find the L.C.M. of $a^2 - b^2$, $a^2 - ab + b^2$ and $a^3 + b^3$.

 $2 \times 10 = 20$

10. What is the relationship between the sides and angles of a triangle?
11. What type of triangle is triangle ABC if $\angle A = 70^\circ$ and $\angle B = 20^\circ$?
12. What is the relationship between AC and AB in triangle ΔABC if $\angle B > \angle C$?
13. If the angle for girls in a pie-chart of 270 students is 80° , then how many girls are there?
14. In an exam, 25 students out of 60 got a GPA of 5. Show the data in a pie-chart.
15. Out of 240 students, 106 got a GPA of 5. Show the data in a pie-chart.

Creative Question (Each question carries 10 marks)**Answer any 5 of the following questions taking at least 1 question from each group :** $10 \times 5 = 50$ **Group- A : Arithmetic**

1. (i) 2, 9, 16, 23, and
(ii) 6, 11, 16, 21 are two number patterns.
a. Determine the 50th term of $(2A + 1)$. 2
b. To make the algebraic expression of the pattern (i), determine the next 4 terms. 4
c. Which term of pattern (ii) is 1026? 4
2. A person deposited Tk. 6000 in a Bank at the rate of profit Tk. 10 per annum in 3 years.
a. Determine the profit-principle at the end of 1st year. 2
b. Determine the difference of simple profit and compound profit. 4
c. In how many years profit-principle will be 1.5 times of the given principal at the rate of same profit? 4

Group- B : Algebra

3. $P = x^2 - ax + 1$, $Q = p^2 + q^2 - r^2$,
 $R = x^6 - 1$ are three algebraic expressions.
a. Resolve into factors of R. 2
b. If $P = 0$, show that $x^4 + \frac{1}{x^4} = a^4 - 4a^2 + 2$. 4
c. If $Q = 0$, prove that, $p^6 + q^6 + 3p^2q^2r^2 = r^6$. 4
4. $P^2 - 2p - 1 = 0$.
a. Find our the value of $(p - \frac{1}{p})$. 2
b. Evaluate the value of $(p^2 + \frac{1}{p^2})(p^3 + \frac{1}{p^3})$. 4
c. In light of the stem prove that $p^8 - 34p^4 + 1 = 0$. 4

Group- C : Geometry

5. Read attentively the following statement :
"ABCD is a quadrilateral. BD is a diagonal of it."
a. Now according to the given information draw a geometric figure and give a brief description. 2

- b. If $AB = CD$ and $\angle ABD = \angle BDC$, prove that ABCD is a parallelogram. 4
- c. Prove that the sum of four angles of ABCD is four right angles. 4
6. Read attentively the following statement :
"ABCD is a rhombus. Two diagonals AC and BD intersect at O."
a. Now according to the given data draw a geometric figure and give a brief description. 2
b. Prove that the diagonals AC and BD bisect each other i.e. $OA = OC$ and $OB = OD$. 4
c. Prove that the diagonals bisect each other at right angles i.e. $\angle AOB = \angle BOC = \angle COD = \angle AOD = 90^\circ$. 4

Group- D : Data & Information

7. The frequency distribution table of marks obtained in Mathematics by 50 students is as follows :

Marks obtained	50	55	60	65	70	75	80
Frequency	5	7	10	15	8	3	2

 - a. Determine the mean of first ten prime numbers. 2
 - b. Determine the median. 4
 - c. Draw the pie-chart of the data. 4

8. Weekly savings (in taka) of 30 labourers are given below :
153, 160, 145, 135, 148, 168, 170, 176, 150, 160, 183, 156, 140, 135, 146, 158, 160, 154, 166, 177, 138, 145, 157, 144, 155, 137, 148, 171, 168, 180.
a. Determine the mode from the stem. 2
b. To make a frequency distribution table with 5 as class interval; determine the arithmetic mean. 4
c. Draw the histogram of the data. 4

Answer Sheet ▶ Multiple Choice Questions

1	(b)	2	(c)	3	(c)	4	(c)	5	(a)	6	(c)	7	(c)	8	(a)	9	(c)	10	(d)	11	(a)	12	(b)	13	(a)	14	(d)	15	(d)
16	(b)	17	(b)	18	(a)	19	(c)	20	(c)	21	(b)	22	(a)	23	(a)	24	(b)	25	(b)	26	(c)	27	(d)	28	(d)	29	(a)	30	(d)

Solving Reference ▶ Short-Answer Questions

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|---------------------------|----------------------------|-----------------------------|-----------------------------|
| 1 ► See Page 12; Ques. 21 | 5 ► See Page 49; Ques. 03 | 9 ► See Page 130; Ques. 10 | 13 ► See Page 393; Ques. 22 |
| 2 ► See Page 12; Ques. 29 | 6 ► See Page 50; Ques. 08 | 10 ► See Page 299; Ques. 13 | 14 ► See Page 393; Ques. 25 |
| 3 ► See Page 12; Ques. 31 | 7 ► See Page 130; Ques. 01 | 11 ► See Page 299; Ques. 15 | 15 ► See Page 393; Ques. 26 |
| 4 ► See Page 49; Ques. 01 | 8 ► See Page 130; Ques. 07 | 12 ► See Page 299; Ques. 20 | |

Solving Reference ▶ Short-Answer Questions

- | | | | |
|---------------------------|----------------------------|----------------------------|----------------------------|
| 1 ► See Page 17; Ques. 06 | 3 ► See Page 113; Ques. 07 | 5 ► See Page 266; Ques. 01 | 7 ► See Page 401; Ques. 09 |
| 2 ► See Page 54; Ques. 08 | 4 ► See Page 114; Ques. 10 | 6 ► See Page 267; Ques. 02 | 8 ► See Page 402; Ques. 10 |



Model Test 03

Time : 3 hours

Half-Yearly Exam

Mathematics • Class : Eight

Full marks : 100

Multiple Choice Questions (Each question carries 1 mark)

 $1 \times 30 = 30$

[N.B. : Answer all the questions. Each question carries one mark. Block fully, with a ball-point pen, the circle of the letter that stands for the correct/best answer in the "Answer Sheet" for Multiple Choice Question Type Examination.]

1. Which one is the magic number of magic square of order 4?
Ⓐ 16 Ⓑ 17 Ⓒ 34 Ⓓ 68
2. Which one of the following is the magic number of magic square of order 4?
Ⓐ 15 Ⓑ 17 Ⓒ 34 Ⓓ 40
3. Which one of the following is the magic number of magic square of order 3?
Ⓐ 12 Ⓑ 15 Ⓒ 16 Ⓓ 34
4. 3, 5, 7, 9 what is the general term?
Ⓐ 2A Ⓑ 2A Ⓒ A + 1 Ⓓ 3A - 2
5. In the algebraic expression $(A^2 - 1)$
 - i. 1st term is zero
 - ii. Sum of 1st 4 terms is 26.
 - iii. Difference of two consecutive number is 5.
 Which one of the following is correct?
Ⓐ i & ii Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii
6. What is the sum of a two digit number 45 and number obtained by interchanging the digits?
Ⓐ 100 Ⓑ 99 Ⓒ 90 Ⓓ 89
7. For the natural numbers —.
 - i. 15 is the magic square of order 3
 - ii. $6^2 + 8^2 = 14^2$
 - iii. The sum of natural numbers from 1 to 10 is 55
 Which one is correct?
Ⓐ i & ii Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii
8. What is compound profit of Tk. 500 in 3 years at 20% profit?
Ⓐ Tk. 300 Ⓑ Tk. 364 Ⓒ Tk. 800 Ⓓ Tk. 864
9. What is the compound principal (in taka) of Tk. 2000 at the profit of 10% per annum in 2 years?
Ⓐ 242 Ⓑ 420 Ⓒ 2400 Ⓓ 2420
10. Answer to the questions No. 10 and 11 by using the following information :
Present population of a town is 10 lac. The growth rate of population of the town is 30 per thousand.
How many population of the town will increase in one year?
Ⓐ 3,000 Ⓑ 30,000
Ⓒ 10,03,000 Ⓓ 10,30,000
11. What will be the population of the town after 3 years?
Ⓐ 10,90,000 Ⓑ 10,92,772
Ⓒ 10,92,720 Ⓓ 10,92,727
12. What is the compound principal of Tk. 62500 in 3 years at the profit of Tk. 8 percent per annum?
Ⓐ Tk. 68732 Ⓑ Tk. 69732
Ⓒ Tk. 78732 Ⓓ Tk. 80732
13. What is the compound profit of Tk. 3,000 at the profit of 8.5% per annum in 3 years?
Ⓐ Tk. 3831.86 Ⓑ Tk. 3765
Ⓒ Tk. 831.86 Ⓓ Tk. 765
14. The formula of compound principal determination is —.
Ⓐ $C = P(1+r)^n$ Ⓑ $C = P(1+n)^r$
Ⓒ $C = P(1+r)^n - P$ Ⓓ $C = P + A$

15. What is the formulae for compound principal?
Ⓐ $I = pnr$ Ⓑ $I = (1-r)^n$
Ⓒ $P = C(1+r)^n$ Ⓑ $C = P(1+r)^n$
16. What is the compound principal of Tk. 3,000 in 2 years at the rate of profit 5%?
Ⓐ Tk. 3307.50 Ⓑ Tk. 4500.00
Ⓒ Tk. 6750.00 Ⓓ Tk. 11025.00
17. Which one is the lowest form of $\frac{x^2 - x - 30}{x^2 - 36}$?
Ⓐ $\frac{x+5}{x-6}$ Ⓑ $\frac{x+5}{x+6}$ Ⓒ $\frac{x-5}{x+6}$ Ⓓ $\frac{x-5}{x-6}$
18. Which one is the factor of $a^2 - 2ab + 2b - 1$?
Ⓐ $(a+1)$ Ⓑ $(a-1)$
Ⓒ $(a-2b)$ Ⓓ $(a+2b)$
19. Which one of the following is the factor of $x^2 - 5x + 6$?
Ⓐ $x-3$ Ⓑ $x+2$ Ⓒ $x+3$ Ⓓ $x-6$
20. Which one is the factorized form of $2x^2 + 7x - 4$?
Ⓐ $(2x-1)(x-4)$ Ⓑ $(2x+1)(x-4)$
Ⓒ $(2x-1)(x+4)$ Ⓓ $(2x+1)(x+4)$
21. Which is the factor of $3x^2 + x - 10$?
Ⓐ $x-2$ Ⓑ $x+2$ Ⓒ $3x+5$ Ⓓ $2x+5$
22. Who is the author of the famous book "Elements"?
Ⓐ Ptolemy Ⓑ Pythagoras
Ⓒ Euclid Ⓓ Archimedes
23. Which of the following has no endpoints?
Ⓐ Line Ⓑ Point Ⓒ Line segment Ⓓ Ray
24. What is the term for a postulate in which a geometric concept is logically established?
Ⓐ Construction Ⓑ Theorem
Ⓒ Postulate Ⓓ Corollary
25. How many steps are involved in proving a theorem?
Ⓐ 2 Ⓑ 3 Ⓒ 4 Ⓓ 5
26. What is the mode of the numbers — 25, 12, 17, 8, 25, 12, 7, 5, 12, 5 ?
Ⓐ 25 Ⓑ 12
Ⓒ 5 Ⓓ None of the above
27. What is the range of the data 121, 213, 107, 219, 199, 120?
Ⓐ 99 Ⓑ 100 Ⓒ 112 Ⓓ 113
28. The range of a data is 26 and the highest value is 42 then, which one is the lowest value?
Ⓐ 15 Ⓑ 16 Ⓒ 17 Ⓓ 34
29. What is the range of the number 21, 24, 18, 10, 6, 23, 30?
Ⓐ 9 Ⓑ 10 Ⓒ 24 Ⓓ 25
30. What is called a data arranged in a particular characteristic?
Ⓐ Unorganized data Ⓑ Non-arranged data
Ⓒ Organized data Ⓓ None of the above

Short-Answer Question (Each question carries 2 marks)

Answer any 10 of the following questions :

- Express the fifth term of the algebraic expression $(3n + 2)$ as the sum of two squares.
- Show that the sum of 79 and the number, obtained by interchanging its two digits, is a multiple of 11.
- Draw the geometric pattern of the first three terms of the algebraic expression $(5n + 2)$.
- Find the difference between simple profit and compound profit on Tk 1000 in 1 year at 10.50% profit per annum.
- What initial principal makes a compound principal of Tk 20000 in 5 years at 13%?
- What will be the compound profit of Tk 50000 at a compound profit of 4 per cent per annum in 10 years.
- Find the H.C.F. of $6x^2 + 3xy$, $2x^3 + 5x^2 - 12x$ and $x^4 - 8x$.

 $2 \times 10 = 20$

- Find the L.C.M. of $a^2 - 4$, $a^2 + 4a + 4$ and $a^3 - 8$?
- Find the L.C.M. of $a^2 - b^2$ and $a^4 + a^2b^2 + b^4$?
- Write the relationship between the sides and angles of triangle ABC.
- What type of triangle is triangle ΔABC if $\angle A = 70^\circ$ and $\angle B = 40^\circ$?
- Write the relationship between the sum or difference of any two sides of a triangle and the third side.
- What is the angle in a pie-chart for 200 out of 600 students?
- How many marks out of 60 would a student need to get an angle of 150° in a pie-chart?
- What is the arithmetic mean of the numbers 2, 1, 9, 0, 3, 5, 7, 9, 11, and 6?

Creative Question (Each question carries 10 marks)

Answer any 5 of the following questions taking at least 1 question from each group :

 $10 \times 5 = 50$ **Group- A : Arithmetic**

- 8, 15, 22, 29, and 19, 29, 39, 49, are two patterns of natural numbers.
 - Find the difference of 1st and 2nd terms of an algebraic expression $(5a - 2)$ of a pattern. 2
 - Expressing the first pattern as an algebraic expression, find its 27th term. 4
 - Determine the first 55 terms of the 2nd pattern. 4
- Some principal becomes Tk. 6000 as profit-principal in 4 years and Tk. 6500 as profit-principal in 6 years.
 - What is the profit of 4 years? 2
 - Find the principal and the rate of profit. 4
 - At the same rate what will be the compound profit in 3 years? 4

Group- B : Algebra

- $x^2 + (3a + 4b)x + (2a^2 + 5ab + 3b^2)$ is an algebraic expression.
 - Factorize the constant part. 2
 - Factorize the algebraic expression. 4
 - Show that, if $a = -b$; then $(x + b)$ is a factor of the expression. 4
- $y^2 - 7y - 1$, $15a^2 + 4a - 3$, $9a^3 - a$ and $27a^3 - 1$ are four algebraic expressions.
 - Find the square of $(b^2 + c^3)$. 2
 - If the first expression = 0, then find out the value of $\frac{y^8 + 1}{y^4}$. 4
 - Find out the L.C.M. of 2nd, 3rd and 4th expressions. 4

Group- C : Geometry

- The diagonals AC and BD of the parallelogram ABCD intersect at O.
 - Draw a kite and a Trapezium. 2
 - Prove that $\angle A = \angle C$ and $\angle B = \angle D$. 4
 - If the two bisectors of $\angle B$ and $\angle C$ meet together at the point E. Prove that $BE \perp CE$. 4
- The lengths of the adjacent two sides of a parallelogram are 6cm, 5cm and their included angle is 70° .
 - The length of a side of a square is 6cm, construct the square. [Sign of construction is essential]. 2
 - Construct the parallelogram. [Sign of construction and description are essential] 4
 - Considering the two sides of parallelogram as two diagonals of a rhombus, construct the rhombus. [Sign of construction and description are essential] 4

Group- D : Data & Information

- Marks obtained by 30 students in Mathematics of class eight are :

60, 45, 40, 55, 58, 68, 54, 68, 49, 56, 59, 49, 42, 72, 70, 59, 52, 70, 53, 64, 70, 48, 57, 67, 70, 63, 41, 61, 62, 50.

 - Determine the number of classes taking 5 as class interval. 2
 - Determine the median of given data. 4
 - Make a frequency distribution table with 6 as class interval and determine arithmetic mean. 4
- The frequency distribution table of 60 students in English is given below :

Class interval	46-50	51-55	56-60	61-65	66-70	71-75
Frequency	4	8	10	20	12	6

- Make a cumulative frequency distribution table. 2
- Find the arithmetic mean from the table. 4
- Draw a histogram from the table. 4

Answer Sheet ▶ Multiple Choice Questions

1	C	2	C	3	B	4	A	5	A	6	B	7	B	8	B	9	D	10	B	11	D	12	C	13	C	14	A	15	D
16	A	17	B	18	B	19	A	20	C	21	B	22	C	23	A	24	B	25	C	26	B	27	D	28	C	29	D	30	C

Solving Reference ▶ Short-Answer Questions

- | | | | |
|---------------------------|----------------------------|-----------------------------|-----------------------------|
| 1 ▶ See Page 13; Ques. 35 | 5 ▶ See Page 50; Ques. 07 | 9 ▶ See Page 131; Ques. 12 | 13 ▶ See Page 393; Ques. 20 |
| 2 ▶ See Page 13; Ques. 43 | 6 ▶ See Page 50; Ques. 10 | 10 ▶ See Page 299; Ques. 14 | 14 ▶ See Page 394; Ques. 27 |
| 3 ▶ See Page 14; Ques. 47 | 7 ▶ See Page 130; Ques. 03 | 11 ▶ See Page 299; Ques. 17 | 15 ▶ See Page 394; Ques. 32 |
| 4 ▶ See Page 50; Ques. 06 | 8 ▶ See Page 130; Ques. 09 | 12 ▶ See Page 299; Ques. 21 | |

Solving Reference ▶ Short-Answer Questions

- | | | | |
|---------------------------|----------------------------|----------------------------|----------------------------|
| 1 ▶ See Page 21; Ques. 17 | 3 ▶ See Page 121; Ques. 02 | 5 ▶ See Page 274; Ques. 13 | 7 ▶ See Page 407; Ques. 19 |
| 2 ▶ See Page 55; Ques. 11 | 4 ▶ See Page 132; Ques. 03 | 6 ▶ See Page 285; Ques. 02 | 8 ▶ See Page 411; Ques. 28 |



Model Test 04

Time : 3 hours

Annual Exam

Mathematics ◉ Class : Eight

Full marks : 100

Multiple Choice Questions (Each question carries 1 mark)

 $1 \times 30 = 30$

[N.B. : Answer all the questions. Each question carries one mark. Block fully, with a ball-point pen, the circle of the letter that stands for the correct/best answer in the "Answer Sheet" for Multiple Choice Question Type Examination.]

1. In metric system, what is the unit of measurement of length?
 A Km B Metre
 C Milimetre D Centimetre
2. In Greek language hepto means—
 A 10 times B 100 times
 C 1,000 times D 10,000 times
3. The length of a rectangular garden is one and half times its breadth. If breadth is 16 metres, what is its perimeter?
 A 40 m B 64 m C 80 m D 96 m
4. How many feet long tape is used to measure a large length?
 A 30 B 10 C 300 D 100
5. In metric system 1 kilometre equal—.
 i. 10 hectometre
 ii. 100 decametre
 iii. 1000 metre
 Which one is correct?
 A i & ii B i & iii C ii & iii D i, ii & iii
6. Which one is the tabular form of $S = \{x : x \text{ is a prime factor of } 12\}$?
 A {1, 2, 3} B {2, 3}
 C {2, 3, 6} D {1, 2, 3, 6}
- Answer the questions No. 7 and 8 in the light of the informations given below :
 $A = \{x : x \text{ is an odd number and } 1 < x < 7\}$
 $B = \{x : x \text{ is prime number and } 1 < x < 9\}$
7. Which one of the following is set A?
 A {2, 3, 5, 7} B {2, 7} C {3, 5} D {}
8. Which one of the following $(A \setminus B)$?
 A {2, 3, 5, 7} B {2, 7} C {3, 5} D {}
9. Which is the sub-set of $A = \{a, b, c\}$?
 A {b, c, d} B {a, b, d} C {a, c, d} D {}
10. What is the number of subsets of the set {1, 2, 3, 4}?
 A 4 B 8 C 16 D 32
11. If the highest value is 80 and the lowest value is 40 of any data and the class interval is 5, what will be the number of classes?
 A 8 B 9 C 40 D 41
12. The range of a data is 26 and the highest value is 42 then, which one is the lowest value?
 A 15 B 16 C 17 D 34
13. The number of tally marks in a class is called—.
 A Frequency B Class mid-value
 C Range of class D Class interval
14. If the highest value of the data is 60, lowest value is 20 and class interval is 5 then which one is the number of class?
 A 8 B 9 C 40 D 41

15. What kind of data are 30, 45, 40, 36, 42, 36, 33, 42 of the ages of 8 people?
 A Organized B Disorganized
 C Tally data D Class data
16. The measure of a semicircular angle is —?
 A 60° B 70° C 80° D 90°
17. How many tangents can be drawn from a point outside of a circle?
 A 1 B 2 C 3 D 4
18. What is the measure of a semi-circular angle?
 A 180° B 120° C 100° D 90°
19. In ΔABC , if $AB = AC$ and $\angle A = 80^\circ$ then, what is the value of $\angle B$?
 A 40° B 50° C 60° D 100°
20. Each chord divides a circle into how many arcs?
 A 1 B 2 C 3 D 4
21. What is called the opposite side of the right angle of a right angled triangle?
 A Hypotenuse B Base
 C Perpendicular D Diagonal
22. How many acute angles are there in a right angled triangle?
 A 1 B 2 C 3 D 4
23. By which of the following right angle triangle can be drawn?
 A 6 cm, 8 cm, 12 cm B 5 cm, 12 cm, 13 cm
 C 7 cm, 9 cm, 11 cm D 5 cm, 11 cm, 12 cm
24. If BC is hypotenuse of triangle ABC.
 i. $\angle A$ = right angle
 ii. $\angle B$ and $\angle C$ are acute angle
 iii. $\angle B + \angle C = 90^\circ$
 Which one is correct?
 A i & ii B i & iii C ii & iii D i, ii & iii
25. Which one of the following is the lowest form of $\frac{x^2 - 1}{x + 1}$?
 A x B x + 1 C x - 1 D $x^2 + 1$
26. Which is the equivalent fraction of $\frac{a}{b}$?
 A $\frac{a^2}{ab}$ B $\frac{a^3}{b^3}$ C $\frac{a^2}{b^2}$ D $\frac{ab}{a^2}$
27. If $x - y = 2p$ and $px + qy = p^2 + q^2$, then $(x, y) = ?$
 A $(p - q, p + q)$ B $(q - p, p + q)$
 C $(p + q, p - q)$ D $(p + q, q - p)$
28. If $x + y = 7$ and $x - y = 3$ then, what is the value of (x, y) ?
 A $(2, 2)$ B $(2, 5)$ C $(10, 4)$ D $(5, 2)$
29. If $x + y = 4$, $x - y = 2$, then which is the root of simultaneous equations?
 A $(1, 3)$ B $(3, 1)$ C $(3, -1)$ D $(3, 4)$
30. What is the power of equation $2x + 3y = 10$.
 A 1 B 2 C 3 D 4



Short-Answer Question (Each question carries 2 marks)**Answer any 10 of the following questions :**

1. What do deca, hecto and kilo mean in Greek language?
2. What are the advantages of the metric system?
3. What is meant by statistics and statistical data?
4. What are the steps to create a frequency distribution table?
5. Into how many arcs does each chord divide a circle? Draw a figure to show it.
6. What is the circumference of a circle?
7. Write down two properties of a right-angled triangle.
8. State the Pythagoras theorem.
9. Express in the lowest form $\frac{m^3n^2 - m^2n^3}{m^3n - mn^3}$.

 $2 \times 10 = 20$

10. Express in the lowest form $\frac{m^2 + 6m + 5}{m^2 + 10m + 25}$.
11. Solve by the method of elimination :
12. Solve the equations $ax - by = a - b$ and $ax + by = a + b$ by the method of elimination.
13. What is meant by the complement of a set?
14. If $A = \{1, 2, 3, 4, 5, 6\}$, $B = \{1, 3, 5\}$, and $C = \{3, 4, 5, 6\}$, then determine the universal set with respect to sets B and C.
15. If $A = \{2, 3, 4\}$, $B = \{3, a\}$, and $C = \{a, b\}$, then find $(A \cup B) \cap C$.

Creative Question (Each question carries 10 marks)**Answer any 5 of the following questions taking at least 1 question from each group :** $10 \times 5 = 50$ **Group- A : Arithmetic**

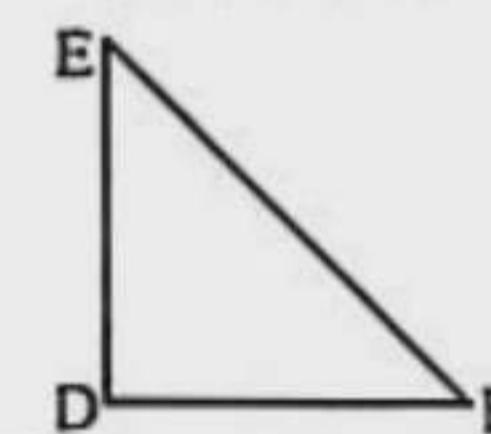
1. The length of a rectangular garden is 50m. its breadth is 40 m. In the middle of the garden a pond is dug with 3m. depth whose bank is 3m. wide.
 - a. Determine how many metres in a yard. 2
 - b. Find out the weight of the water in the pond. 4
 - c. There is a 4 metres wide road around the outside of a square land which perimeter is equal to the rectangular garden. Find the area of the road. 4
2. The length of floor of a room is $1 \frac{1}{2}$ times of the width. The height of the room is 4 meters. Area of the floor is 150 sq. meters. An amount of Tk. 7500 is spent to cover the floor with 50 cm. square stone.
 - a. What is the width of the room in metres? 2
 - b. What is the price of each square stone? 4
 - c. What is the weight of water in kgs contained in a reservoir equal to the volume of the room? 4

Group- B : Algebra

3. $M = x^2 - 3x + 2$, $N = x^2 - 5x + 6$ and $K = x^2 - 4x + 3$ are three algebraic expressions.
 - a. Express, $\frac{M}{x-2}$ in the lowest form. 2
 - b. Simplify : $\frac{1}{M} + \frac{1}{N} + \frac{1}{K}$. 4
 - c. Express $\frac{1}{M^2}, \frac{1}{N^2}, \frac{1}{K^2}$ in the form of the common denominator. 4
4. Read attentively the following statement : "A = {x ∈ N : x < 10 and x is even} and B = {the set of natural numbers which on dividing 105 and 147 leaves 35 as remainder in each case}.".
 - a. Now determine the set A. 2
 - b. Determine the set B. 4
 - c. Find $A \times A$ and $P(A \cap B)$. 4

Group- C : Geometry

5. In the figure $EF^2 = DE + DF^2$ in $\triangle DEF$.



- a. If the edge of a cube is 5.5cm, find the area of the entire faces of the cube. 2
- b. Prove that, $\angle D = 90^\circ$. 4
- c. If P and Q are the mid points of DE and EF respectively, prove that, $PQ = \frac{1}{2}DF$. 4

6. AB is diameter and CD is chord other than diameter of circle with centre O.
 - a. Find out the area of a circular field with diameter 6.4 metre. 2
 - b. Prove that $AB > CD$. 4
 - c. If E is the midpoint of CD, then prove that $OE \perp CD$. 4

Group- D : Data & Information

7. The secured marks in Mathematics of 15 students of class six in S. H. Khan School are : 95, 62, 87, 32, 59, 92, 82, 66, 75, 99, 44, 37, 58, 51, 62.
 - a. Is the data an organized data? Bring the data in an organized form. 2
 - b. Determine arithmetic mean of the data. 4
 - c. Find median and mode of the data. 4
8. The marks obtained in Bangla by 30 students of class viii are : 50, 36, 62, 80, 72, 59, 54, 60, 86, 63, 84, 70, 85, 88, 64, 78, 44, 55, 72, 63, 56, 60, 42, 82, 75, 62, 38, 46, 40, 72.
 - a. Determine the range. 2
 - b. Determine the median. 4
 - c. Make a frequency distribution table taking 5 as class interval. 4

Answer Sheet ▶ Multiple Choice Questions

1	⑥	2	⑥	3	⑧	4	⑦	5	⑦	6	⑥	7	⑧	8	⑦	9	⑦	10	⑧	11	⑥	12	⑧	13	⑦	14	⑥	15	⑥
16	⑦	17	⑧	18	⑦	19	⑥	20	⑥	21	⑧	22	⑥	23	⑦	24	⑦	25	⑧	26	⑦	27	⑦	28	⑦	29	⑥	30	⑧

Solving Reference ▶ Short-Answer Questions

- | | | | |
|----------------------------|----------------------------|-----------------------------|-----------------------------|
| 1 ▶ See Page 73; Ques. 03 | 5 ▶ See Page 348; Ques. 06 | 9 ▶ See Page 150; Ques. 01 | 13 ▶ See Page 241; Ques. 21 |
| 2 ▶ See Page 73; Ques. 05 | 6 ▶ See Page 348; Ques. 10 | 10 ▶ See Page 150; Ques. 05 | 14 ▶ See Page 241; Ques. 23 |
| 3 ▶ See Page 391; Ques. 02 | 7 ▶ See Page 321; Ques. 03 | 11 ▶ See Page 193; Ques. 08 | 15 ▶ See Page 241; Ques. 28 |
| 4 ▶ See Page 391; Ques. 06 | 8 ▶ See Page 321; Ques. 06 | 12 ▶ See Page 193; Ques. 10 | |

Solving Reference ▶ Short-Answer Questions

- | | | | |
|---------------------------|----------------------------|----------------------------|----------------------------|
| 1 ▶ See Page 80; Ques. 04 | 3 ▶ See Page 173; Ques. 08 | 5 ▶ See Page 326; Ques. 05 | 7 ▶ See Page 397; Ques. 01 |
| 2 ▶ See Page 81; Ques. 07 | 4 ▶ See Page 243; Ques. 03 | 6 ▶ See Page 353; Ques. 06 | 8 ▶ See Page 398; Ques. 03 |



Model Test 05

Time : 3 hours

Annual Exam

Mathematics Class : Eight

Full marks : 100

Multiple Choice Questions (Each question carries 1 mark)

 $1 \times 30 = 30$

[N.B. : Answer all the questions. Each question carries one mark. Block fully, with a ball-point pen, the circle of the letter that stands for the correct/best answer in the "Answer Sheet" for Multiple Choice Question Type Examination.]

1. The perimeter of a square field is 8 yards. What is the area of the field in square feet?
Ⓐ 12 Ⓑ 24 Ⓒ 36 Ⓓ 64
 2. If the length of the side of a square is 5 cm, then its—
 i. Area = 25 sq cm
 ii. length of a diagonal = $5\sqrt{2}$ cm
 iii. Perimetre = 10 cm
 Which one is correct?
Ⓐ i & ii Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii
 3. If the base 1.5 m hight 80 cm then how much area in sq. metre of triangle?
Ⓐ 0.6 Ⓑ 1.2 Ⓒ 60 Ⓓ 120
 4. Which one of the following is the perimeter of a square?
Ⓐ 4 × one side Ⓑ 4 × one diagonal
Ⓒ 3 × one side Ⓒ 2(length + breadth)
 5. What is the area of a cubic having the sides 4 cm each?
Ⓐ 16 sq. cm Ⓑ 24 sq. cm
Ⓒ 64 sq. cm Ⓒ 96 sq. cm
 6. How many steps are taken for making frequency table?
Ⓐ 3 Ⓑ 4 Ⓒ 5 Ⓓ 6
 7. If range is 25, class interval is 4, what is number of class?
Ⓐ 6 Ⓑ 6.25 Ⓒ 7 Ⓓ 7.25
- Answer question No. 8 and 9 on the basis of the information given below :
- | Class interval | 41 – 55 | 56 – 70 | 71 – 85 | 86 – 100 |
|----------------|---------|---------|---------|----------|
| Frequency | 6 | 10 | 20 | 4 |
8. Which is the class interval of the data?
Ⓐ 5 Ⓑ 10 Ⓒ 14 Ⓓ 15
 9. What is the mid-value of the 2nd class?
Ⓐ 62 Ⓑ 63 Ⓒ 64 Ⓓ 65
 10. How many degree is found in the centre of pie-chart?
Ⓐ 90° Ⓑ 180° Ⓒ 270° Ⓓ 360°
 11. Pie-chart is—.
 i. one kind of diagram
 ii. a circular diagram
 iii. if a statistics is presented as a part of 360°
 Which one is correct?
Ⓐ i & ii Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii
 12. What is the angle subtended at the centre of a circle?
Ⓐ 90° Ⓑ 180° Ⓒ 270° Ⓓ 360°
 13. What is the value of AB?
Ⓐ 12 Ⓑ 24 Ⓒ 65 Ⓓ 194
 14. If $\angle OAB = 60^\circ$, what type of triangle is ABC?
Ⓐ Equilateral Ⓑ Scalene
Ⓒ Right angled Ⓒ Acute angled

15. What is the circumference of the circle of 5 cm diameter?
Ⓐ 15 cm Ⓑ 15.71 cm Ⓒ 17.7 cm Ⓓ 18.7 cm
16. The diametre of a wheel of a vehicle is 38 cm. What will be the distance covered by two complete round?
Ⓐ 59.69 cm Ⓑ 76 cm
Ⓒ 119.38 cm Ⓓ 238.76 cm
17. Who was Pythagoras?
Ⓐ A Mathematician Ⓑ A Physicist
Ⓒ A Greek Philosopher Ⓒ A Chemist
18. When did Pythagoras define Pythagoras theorem?
Ⓐ In 6th century B.C. Ⓑ In 5th century B.C.
Ⓒ In 4th century B.C. Ⓒ In 3rd century B.C.
19. A circle with area 1256 sq metres. What will be the diameter of the circle in centimetre?
Ⓐ 400 Ⓑ 40 Ⓒ 20 Ⓓ 10
20. In ΔABC , $\angle B$ = one right angle and $AC = 10$ cm. What is the sum of the squares of the sides of the triangle in sq cm?
Ⓐ 24 Ⓑ 100 Ⓒ 200 Ⓓ 480
21. If the difference of the two acute angles of a right angled triangle is 25°, then what is the value of the smallest angle in degree?
Ⓐ 65 Ⓑ 57.5 Ⓒ 32.5 Ⓓ 45
22. If in a ΔABC , $\angle C = 90^\circ$, $AB = 13$ cm and $AC = 12$ cm, what is the value of BC in centimeter?
Ⓐ 1 Ⓑ 5 Ⓒ 17.69 Ⓓ 25
23. Which is the lowest form of $\frac{x^2 - 6x + 5}{x^2 + 4x - 45}$?
Ⓐ $\frac{x+1}{x+9}$ Ⓑ $\frac{x-1}{x+9}$ Ⓒ $\frac{x+9}{x-1}$ Ⓓ $\frac{x-1}{x-9}$
24. Which equation is satisfied by the point (3, 2)?
Ⓐ $x - y = 0$ Ⓑ $2x - 3y = 0$
Ⓒ $x = \frac{1}{y}$ Ⓒ $2x + 3y = 5$
25. If $C = \{1, 2, 3\}$, then how many subset are there of $P(C)$?
Ⓐ 6 Ⓑ 7 Ⓒ 8 Ⓓ 9
26. If $A = \{2, 4, 6, 7, 8\}$ and $B = \{2, 4, 6\}$. How many numbers of subsets are there of the set $A \cap B$?
Ⓐ 3 Ⓑ 8 Ⓒ 16 Ⓓ 32
27. If $A = \{5, 6, 7\}$ and $B = \{4, 6, 7\}$, then—
 i. $A \cap B = \{6, 7\}$
 ii. $A \cup B = \{4, 5, 6, 7\}$
 iii. Number of subset of A is 6
 Which one is correct?
Ⓐ i & ii Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii
28. What is the subset of any set?
Ⓐ $\{0\}$ Ⓑ $\{\emptyset\}$ Ⓒ \emptyset Ⓓ (\emptyset)
29. If $P = \{x, y, z\}$, which one of the following is not subset of P?
Ⓐ $\{x, y\}$ Ⓑ $\{x, w, z\}$ Ⓒ $\{x, y, z\}$ Ⓓ \emptyset
30. If $U = \{1, 2, 3, 4\}$ and $A = \{2, 4\}$ the A^c = What?
Ⓐ $\{1, 3\}$ Ⓑ $\{1, 2, 4\}$ Ⓒ $\{1, 3, 4\}$ Ⓓ $\{2, 4, 3\}$



Short-Answer Question (Each question carries 2 marks)**Answer any 10 of the following questions :** $2 \times 10 = 20$

- A runner ran 25 rounds in a circular track of a length of 500 metres. How much distance did he run?
- If 3 metric tons of rice is divided equally among 75 workers, how much rice will each get?
- What is organized and disorganized data? Give an example.
- Define class interval with example.
- What are the number and shape of arcs made by a diameter of a circle?
- Define the radius of a circle with a figure.
- In triangle PQR, $PQ^2 + QR^2 = PR^2$. If $PQ = 9$ cm and $QR = 12$ cm, find the value of PR.
- In triangle ABC, $\angle B = 90^\circ$. If D and E are the midpoints of AB and BC respectively, show that $AC^2 = 4DE^2$.

- Express the fractions with a common denominator $\frac{m^2}{mn}, \frac{n^2}{nl}, \frac{l^2}{lm}$.
- Find the sum of $\frac{x}{x^2 - xy + y^2}$ and $\frac{xy}{x^3 + y^3}$.
- Solve the equations $x - y = 4$ and $x + y = 6$ by the method of elimination.
- What is the value of x in the system of equations $2x - y = 5$, $x - y = 2$?
- If $P = \{x : x$ is a factor of 8} and $Q = \{x : x$ is a factor of 12}, then find $P \cup Q$.
- If $U = \{1, 2, 3, 4, 5, 6, 7\}$, $A = \{1, 3, 5\}$, and $B = \{2, 4, 6\}$, then $A' \cap B'$ = what?
- If $U = \{2, 4, 6, 8, 10\}$ and $P = \{2, 4, 10\}$, then what is $P \cup P'$?

Creative Question (Each question carries 10 marks)**Answer any 5 of the following questions taking at least 1 question from each group :** $10 \times 5 = 50$ **Group- A : Arithmetic**

- The air is 0.00129 times heavier than the water. The length of floor, breadth of the floor and height of a house are 20 meter, 10 meter and 5 meter respectively.
 - Find the area of the floor of the house.
 - How many kilogram air are there in the house?
 - Find the volume of the four walls of the house if the thickness of the wall is 12 cm.
- The length of a pond is 54 metres and breadth is 36 metres and 50 centimeters. Its bank around inside is 2.5 metres wide and depth is 6 metres.
 - Find the perimeter of the pond.
 - Find out the area of the bank of the pond.
 - How much time is required to empty the pond, when 0.2 cubic metre water is emptied per minute by a machine?

Group- B : Algebra

- $ax - y = 1$ and $x + ay = 8$ are two simple equations.
 - Justify a solution of $ax - y = 1$ is $(2, 5)$ if $a = 3.2$
 - Solve the pair of equations.
 - Solve the pair of equations with the help of graph when $a = 2$.
- The sets of the integers by which the numbers 346 and 556 are divided with remainder 31 in each case are A and B.
 - Express set A in set builders form.
 - Find $A \cap B$.
 - Show $A \cap B$ in Venn-diagram and write the subsets of $A \cap B$.

Group- C : Geometry

- PQ and LM are two chords of circle PQML with centre O and $OP = 3$ cm.



- Find the circumference of the circle. [$\pi = 3.14$]

2

- If $QE = OF$, then prove that, $PQ = LM$.

4

- From the ΔOLF , prove that, $OL^2 = OF^2 + LF^2$.

4

- O is the centre and AB and CD are two chords of the circle ABCD.

- If chord AB is diameter of the circle ABCD, show that $AB > CD$. [Easy]

2

- If $AB = CD$, show that the distances of O from AB and CD are equal. [Medium]

4

- If AB bisects CD, prove that two parts of chords AB are equal to the two parts of CD. [Hard]

4

Group- D : Data & Information

- The frequency distribution table of marks in Mathematics obtained by 50 students of a school is given below :

Obtained Marks	41-50	51-60	61-70	71-80	81-90	91-100
No of students	6	8	13	10	8	5

- What obtained marks out of 60 for a student indicate 150° angle in pie-chart?

2

- Find the arithmetic mean from table.

4

- Draw the histogram of the data with description.

4

- Weekly savings (in taka) of 30 labourers are given below : 153, 160, 145, 135, 148, 168, 170, 176, 150, 160, 183, 156, 140, 135, 146, 158, 160, 154, 166, 177, 138, 145, 157, 144, 155, 137, 148, 171, 168, 180.

- Determine the mode from the stem.

2

- To make a frequency distribution table with 5 as class interval, determine the arithmetic mean.

4

- Draw the histogram of the data.

4

Answer Sheet ▶ Multiple Choice Questions

1	©	2	ⓐ	3	ⓐ	4	ⓐ	5	ⓓ	6	ⓑ	7	ⓐ	8	ⓓ	9	ⓑ	10	ⓓ	11	ⓐ	12	ⓓ	13	ⓑ	14	ⓐ	15	ⓑ
16	ⓓ	17	©	18	ⓐ	19	ⓑ	20	©	21	©	22	ⓑ	23	ⓑ	24	ⓑ	25	©	26	ⓑ	27	ⓐ	28	©	29	ⓑ	30	ⓐ

Solving Reference ▶ Short-Answer Questions

- | | | | |
|----------------------------|----------------------------|-----------------------------|-----------------------------|
| 1 ▶ See Page 74; Ques. 09 | 5 ▶ See Page 348; Ques. 08 | 9 ▶ See Page 151; Ques. 08 | 13 ▶ See Page 241; Ques. 24 |
| 2 ▶ See Page 74; Ques. 13 | 6 ▶ See Page 348; Ques. 09 | 10 ▶ See Page 151; Ques. 13 | 14 ▶ See Page 241; Ques. 26 |
| 3 ▶ See Page 391; Ques. 04 | 7 ▶ See Page 322; Ques. 10 | 11 ▶ See Page 193; Ques. 09 | 15 ▶ See Page 241; Ques. 31 |
| 4 ▶ See Page 391; Ques. 07 | 8 ▶ See Page 322; Ques. 11 | 12 ▶ See Page 193; Ques. 12 | |

Solving Reference ▶ Short-Answer Questions

- | | | | |
|---------------------------|----------------------------|----------------------------|----------------------------|
| 1 ▶ See Page 82; Ques. 08 | 3 ▶ See Page 215; Ques. 03 | 5 ▶ See Page 327; Ques. 06 | 7 ▶ See Page 400; Ques. 07 |
| 2 ▶ See Page 83; Ques. 12 | 4 ▶ See Page 233; Ques. 25 | 6 ▶ See Page 353; Ques. 07 | 8 ▶ See Page 402; Ques. 10 |



Model Test 06

Time : 3 hours

Annual Exam

Mathematics ◊ Class : Eight

Full marks : 100

Multiple Choice Questions (Each question carries 1 mark)

 $1 \times 30 = 30$

[N.B. : Answer all the questions. Each question carries one mark. Block fully, with a ball-point pen, the circle of the letter that stands for the correct/best answer in the "Answer Sheet" for Multiple Choice Question Type Examination.]

1. The perimeter of a wheel of a bicycle is 3.5 meters. How many times will the wheel revolve to cover a distance of 7 kilometres?
Ⓐ 20,000 Ⓑ 2,000 Ⓒ 200 Ⓓ 2
2. How longer is nautical mile than mile in feet?
Ⓐ 800 Ⓑ 4320 Ⓒ 5280 Ⓓ 6080
3. One nautical mile = ?
Ⓐ 4080 feet Ⓑ 5080 feet
Ⓒ 6070 feet Ⓓ 6080 feet
4. At 4°C temperature the weight of 1cc pure water is—.
Ⓐ 1 gm Ⓑ 100 gm Ⓒ 1000 gm Ⓓ 10000 gm
5. What is the weight of 8000 litre pure water?
Ⓐ 1 kg Ⓑ 8 kgs
Ⓒ 8000 kgs Ⓓ 8000 gm
- Marks obtained in mathematics by 10 students of class VIII are :
48, 41, 50, 47, 40, 38, 46, 43, 45, 50.
Answer the questions No. 6 and 7 in respect of the above information :
6. What is range of the above data?
Ⓐ 10 Ⓑ 11 Ⓒ 12 Ⓓ 13
7. What is the arithmetic mean of the above data?
Ⓐ 44.5 Ⓑ 44.8 Ⓒ 45.5 Ⓓ 45.8
8. What is pie-chart?
Ⓐ Graph Ⓑ Table Ⓒ Data Ⓓ Tally
9. Height of histogram is for—.
Ⓐ Frequency Ⓑ Cumulative frequency
Ⓒ Class interval Ⓓ Range
10. How many type of measuring the central tendency are there in Statistics?
Ⓐ 1 Ⓑ 2 Ⓒ 3 Ⓓ 4
- Answer to the questions 11 and 12 with the help of given information :



In the figure $MN = 12\text{ cm}$ and $OP = 8\text{ cm}$.

11. What is the value of PN?
Ⓐ 4 cm Ⓑ 6 cm Ⓒ 8 cm Ⓓ 10 cm
12. A straight line intersects a circle at how many points?
Ⓐ 1 Ⓑ 2 Ⓒ 3 Ⓓ 4
13. What is the angle at the centre of a circle?
Ⓐ 360° Ⓑ 180° Ⓒ 90° Ⓓ 0°
14. In a circle—.
 - i. the perpendicular from the centre to a chord bisects the chord
 - ii. a straight line can intersect it at more than two points
 - iii. the diameter is twice of its radius
 Which one of the following is true?
Ⓐ i & ii Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii

15. What is the measure of the two angles other than the right angle of a right angled triangle?
Ⓐ 60° Ⓑ 180° Ⓒ 90° Ⓓ 270°
16. If $\triangle ABC$ is a right triangle with $\angle B = 90^{\circ}$, then which one of the following is the hypotenuse of $\triangle ABC$?
Ⓐ AB Ⓑ BC
Ⓒ AC Ⓒ None of the above
17. The ratio of the sides of triangle is $1 : 1 : \sqrt{2}$, what is the value of one angle of the triangle?
Ⓐ 30° Ⓑ 45° Ⓒ 60° Ⓓ 100°
18. The ratio of three sides of a triangle is $1 : 1 : \sqrt{2}$. What is the value of the greatest angle?
Ⓐ 80° Ⓑ 90° Ⓒ 100° Ⓓ 180°
19. Which one is the factorized form of expression $x^2 + 2x - 143$?
Ⓐ $(x + 11)(x - 13)$ Ⓑ $(x - 11)(x - 13)$
Ⓒ $(x + 11)(x + 13)$ Ⓒ $(x - 11)(x + 13)$
20. What is the H.C.F. of $a^3 - b^3$ and $a^3 + b^3$?
Ⓐ 0 Ⓑ 1 Ⓒ $a - b$ Ⓓ $a + b$
21. Which one of the following is the H.C.F. of $9a^3b^2c^2$, $12a^2bc$, $15ab^3c^3$?
Ⓐ abc Ⓑ $3abc$
Ⓒ $135a^2b^2c^2$ Ⓒ $180a^3b^3c^3$
22. What is the H.C.F. of $x^2 - 4$, $x^2(x - 2)$ and $x^2y - 2xy$?
Ⓐ $x - 2$ Ⓑ $x + 2$
Ⓒ $x(x - 2)$ Ⓒ $(x + 2)(x - 2)$
23. The sum and the difference of the numerator and the denominator of a proper fraction are 12 and 2. What is the denominator of the fraction?
Ⓐ 3 Ⓑ 5 Ⓒ 7 Ⓓ 9
24. For which value of (x, y) the equation $2x + 3y = 14$ is satisfied?
Ⓐ (4, 2) Ⓑ (4, 1) Ⓒ (1, 4) Ⓓ (2, 4)
25. What is the solution of the equation $2x + y = 7$ and $x + 2y = 8$?
Ⓐ (8, 0) Ⓑ (6, 1) Ⓒ (4, 2) Ⓓ (2, 3)
26. Which is the solution of equations $x + y = 5$ and $2x - y = 4$?
Ⓐ (2, 3) Ⓑ (3, 2) Ⓒ (4, 1) Ⓓ (1, 4)
27. If $A = \{p, q\}$, $B = \{q, r\}$ then—.
 - i. $A \cap B = \{q\}$
 - ii. $A \cup B = \{p, q, r\}$
 - iii. The number of subsets of A is 4
 Which one of the following is correct?
Ⓐ i & ii Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii
28. If $A = \{1, 3, 5\}$ and $B = \{2, 4, 6\}$, then $A \cap B = ?$
Ⓐ {3, 4, 6} Ⓑ {4, 5} Ⓒ {ϕ} Ⓓ ϕ
29. If $A = \{2, 3, 5\}$ and $B = \{2, 5, 6\}$, $A \cap B = \text{what?}$
Ⓐ {2, 3} Ⓑ {2, 5} Ⓒ {3, 5} Ⓓ {2, 3, 5, 6}
30. What is the number of subsets of the set $B = \{a, b, c, d\}$?
Ⓐ 4 Ⓑ 8 Ⓒ 15 Ⓓ 16



Short-Answer Question (Each question carries 2 marks)**Answer any 10 of the following questions :** $2 \times 10 = 20$

- The area of a rectangle is 10 acres, and its length is 5 times its breadth. What is the breadth of the field?
- How many litres of water can a tank with a volume of 3 stayors contain?
- Divide $\frac{x^2 - y^2}{x^2 + xy + y^2}$ by $\frac{x + y}{x^3 - y^3}$.
- $$\frac{p^3 + q^3 + 3pq(p+q)}{(p+q)^2 - 4pq} + \frac{(p+q)^2}{(p-q)^3} = ?$$
- What is meant by the law of transposition and the law of symmetry?
- Write down the axioms of solving equations.
- Express the set $Q = \{-3, -2, -1, 0, 1\}$ in the set builder method.

- Find the subsets of the set $D = \{a, b, 2\}$.
- If the difference between the two acute angles of a right-angled triangle is 15° , what is the value of the smallest angle in degrees?
- State the Pythagoras theorem.
- If the diameter of a wheel is 35 cm, how many cm will the wheel cover in two rotations?
- If the area of a circle is π square units, what is the diameter in units?
- If the angle for girls in a pie-chart of 270 students is 80° , then how many girls are there?
- How many marks out of 60 would a student need to get an angle of 150° in a pie-chart?
- Find the arithmetic mean of the first ten prime numbers.

Creative Question (Each question carries 10 marks)**Answer any 5 of the following questions taking at least 1 question from each group :** $10 \times 5 = 50$ **Group- A : Arithmetic**

- The length of a rectangular region is three times of its breadth. Tk. 955.50 is spent to set the tiles in it at the rate of Tk. 6.50 per square metre. There is a 2 metres wide road around outside of that region.
 - If the breadth is 'a' metre of the rectangular region express its perimeter by 'a'. 2
 - Determine the length and breadth of the rectangular region. 4
 - Determine the area of the road. 4
- The length and breadth of inner side of an open reservoir are 3.8 m and 1.25 m. The reservoir contains 9500 litres water. To put tile's sheet Tk 200 is spent for per sq metre.
 - Determine the length of the diagonal of the rectangle of length 16 metre and breadth 12 metre. 2
 - Find the depth of the reservoir. 4
 - How much money will be spent to put tile's sheet in the inner side of the reservoir? 4

Group- B : Algebra

- $\frac{1}{2x+3y}, \frac{1}{2x-3y}, \frac{2x}{4x^2-9xy^2}$ are three algebraic fractions.
 - Subtract the 2nd fraction from the 1st one. 2
 - Multiply the 1st and 2nd fractions, then divide the required product by the 3rd fraction. 4
 - Express the three fractions in the form of common denominator. 4

- $2x + 4y = 4$ and $3x - 5y = 6$ are simple simultaneous equations.
 - Which equation is satisfied by the co-ordinate (4, -1)? 2
 - Solve two equations. 4
 - Solve two equations with the help of the graph. 4

Group- C : Geometry

- In ΔABC , $\angle A = 90^\circ$, BP and CQ are two medians.
 - Bisect $\angle A$ with the pencil compass. 2
 - Prove that $BC^2 = CQ^2 + 3AQ^2$. 4
 - Prove that $5BC^2 = 4(BP^2 + CQ^2)$. 4
- In a circle with centre O, CM and PS are two chords other than diameter and their mid-points are X and Y respectively.
 - Find the length of OC, when CM = 16 cm. OX = 6 cm. 2
 - Prove that, $OX \perp CM$. 4
 - If CM > PS, then prove that, $OX < OY$. 4

Group- D : Data & Information

- The marks obtained in Mathematics by 40 learners are given below :

70, 35, 80, 40, 60, 55, 58, 45, 60, 65, 48, 70, 46, 50, 60, 65, 70, 58, 60, 48, 85, 72, 36, 85, 60, 50, 46, 65, 55, 61, 60, 52, 58, 90, 65, 78, 84, 83, 55, 45.

 - Find the mean of the numbers 13, 7, 8, 5, 9, 4, 16. 2
 - Make a frequency distribution table with 6 as class interval. 4
 - Find the median of the given data. 4
- The numbers are : 42, 27, 45, 22, 41, 23, 46, 48, 50, 48, 48, 29, 52, 55, 65, 70, 32, 38.
 - 40, 43, 40, 40, 43, 44, 44, 46, 48, 40, 44, 54, 64, 60, 55, 57, 44; Find the mode of the above data. 2
 - Find the median of the given numbers of the stem. 4
 - Find the arithmetic mean by class interval 10. 4

Answer Sheet ▶ Multiple Choice Questions

1	(D)	2	(A)	3	(D)	4	(A)	5	(C)	6	(D)	7	(D)	8	(A)	9	(A)	10	(C)	11	(B)	12	(B)	13	(A)	14	(B)	15	(C)
16	(C)	17	(B)	18	(D)	19	(D)	20	(B)	21	(B)	22	(A)	23	(C)	24	(A)	25	(D)	26	(B)	27	(D)	28	(A)	29	(B)	30	(D)

Solving Reference ▶ Short-Answer Questions

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|----------------------------|----------------------------|-----------------------------|-----------------------------|
| 1 ▶ See Page 76; Ques. 27 | 5 ▶ See Page 224; Ques. 01 | 9 ▶ See Page 321; Ques. 02 | 13 ▶ See Page 393; Ques. 22 |
| 2 ▶ See Page 77; Ques. 32 | 6 ▶ See Page 225; Ques. 03 | 10 ▶ See Page 321; Ques. 06 | 14 ▶ See Page 394; Ques. 27 |
| 3 ▶ See Page 168; Ques. 06 | 7 ▶ See Page 240; Ques. 13 | 11 ▶ See Page 369; Ques. 03 | 15 ▶ See Page 394; Ques. 33 |
| 4 ▶ See Page 168; Ques. 10 | 8 ▶ See Page 240; Ques. 20 | 12 ▶ See Page 369; Ques. 08 | |

Solving Reference ▶ Short-Answer Questions

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|---------------------------|----------------------------|----------------------------|----------------------------|
| 1 ▶ See Page 84; Ques. 13 | 3 ▶ See Page 175; Ques. 13 | 5 ▶ See Page 329; Ques. 09 | 7 ▶ See Page 404; Ques. 14 |
| 2 ▶ See Page 83; Ques. 11 | 4 ▶ See Page 216; Ques. 10 | 6 ▶ See Page 352; Ques. 04 | 8 ▶ See Page 406; Ques. 18 |