

Placement Self-Assessment Test

Grade 7 Test — for students applying to enter Grade 8

Mathematics (Q1–45) • Physics (Q46–60) • Chemistry (Q61–75) • Biology (Q76–90) • 90 questions

Student name:	Date:	Programme code: 12
Grade applying for: 8	Total score: / 90	Signature:

Subject	Mathematics	Physics	Chemistry	Biology	Total
Score (optional)	/ 45	/ 15	/ 15	/ 15	/ 90

Placement Self-Assessment Test

This test is for self-assessment only. It is not included in your official transcript and does not affect your academic record.

- There is no time limit.
- You may use any learning resources, including books, notes, and a calculator, provided that you solve each question yourself and use the resources to improve your own understanding.
- Do not ask another person for answers and do not use artificial intelligence to answer the questions. The purpose of this test is to discover your real level of understanding, not simply to obtain a high score.
- Each correct answer receives **1 point**.
- Each incorrect answer receives a penalty of **–1/3 point**.
- An unanswered question receives **0 points**.
- The suggested passing score is **50 points**.
- You may decide for yourself whether you are ready to move to the next grade or whether it would be better to continue strengthening the current grade first.
- There is no required minimum score in each individual subject. Your subject-by-subject results should help you identify your strengths and the subjects that need more work.
- For example, if you are strong in Mathematics but weak in Chemistry, this test helps us identify the learning materials and support needed to balance your studies.
- Other school subjects are also important. They are not included in this test because Mathematics and Science usually require more teacher guidance and additional practice.

Instructions for Using the Question Booklet and Answer Sheet

Do not write your answers in the question booklet. Each student has an individual answer sheet and must mark all answers only on that answer sheet.

At the top of the answer sheet, enter or mark **12** as the programme code. This code is for the educational programme for Grades 7 to 12.

For placement purposes, each student must take the test for one grade below the grade they wish to enter:

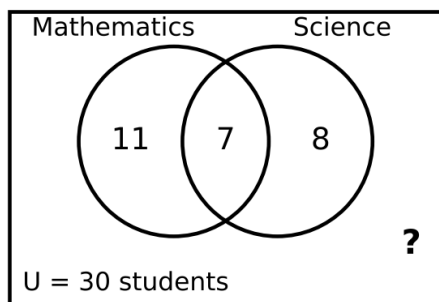
- Students applying for Grade 7 take the Grade 6 test.
- Students applying for Grade 8 take the Grade 7 test.
- Students applying for Grade 9 take the Grade 8 test.
- Students applying for Grade 10 take the Grade 9 test.
- Students applying for Grade 11 take the Grade 10 test.
- Students applying for Grade 12 take the Grade 11 test.

Before starting the test, make sure that your name, personal information, and programme code **12** are correctly entered on your individual answer sheet.

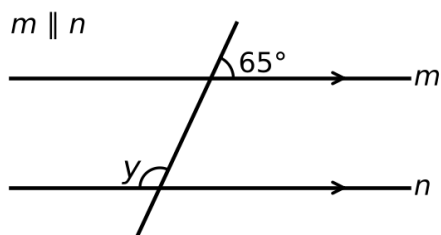
Each question has four options (A, B, C, D) and exactly one correct answer. Use $g = 10 \text{ m/s}^2$ unless a question states otherwise.

Mathematics (Questions 1–45)	
1. Which set lists all the even whole numbers that are greater than 0 and less than 10? A) {1, 3, 5, 7, 9} B) {2, 4, 6, 8} C) {0, 2, 4, 6, 8} D) {2, 4, 6, 8, 10}	4. What is the value of $(-8) + 13 - (-5)$? A) 10 B) –10 C) 6 D) 0
2. If $A = \{1, 2, 3, 4, 5\}$ and $B = \{4, 5, 6, 7\}$, what is $A \cap B$? A) {1, 2, 3} B) {4, 5} C) {1, 2, 3, 4, 5, 6, 7} D) {6, 7}	5. At night the temperature in Bamyan was -9°C . At noon it was 6°C . By how many degrees did the temperature rise? A) 3°C B) 15°C C) -15°C D) -3°C
3. How many subsets does the set $\{a, b, c\}$ have? A) 3 B) 6 C) 8 D) 9	6. What is the value of $(-3) \times (-4) \div (-2)$? A) –6 B) –24 C) 24 D) 6
	7. What is the value of $18 - 3 \times 2^2$? A) –18 B) 60 C) 12 D) 6
	8. What is the value of $\sqrt{144} + \sqrt{25}$? A) 7 B) 13 C) 169 D) 17

9. Between which two whole numbers does $\sqrt{50}$ lie?
 A) 24 and 26 B) 6 and 7
 C) 7 and 8 D) 49 and 51
10. Which of these numbers is prime?
 A) 51 B) 87 C) 91 D) 97
11. What is the prime factorisation of 416?
 A) $2^4 \times 26$ B) $2^5 \times 13$ C) $2^4 \times 13$ D) $2^3 \times 13$
12. What is the highest common factor (HCF) of $2^3 \times 3^2 \times 5$ and $2^2 \times 3^3 \times 7$?
 A) 36 B) 7,560 C) 216 D) 6
13. Three school bells ring every 6, 8 and 12 minutes. They all ring together at 9:00. When will they next ring together?
 A) 9:24 B) 10:00 C) 9:12 D) 9:48
14. What is $-3/4 + 5/6$?
 A) $2/10$ B) $-1/12$ C) $1/12$ D) $19/12$
15. What is $(-2/3) \div (4/9)$?
 A) $-3/2$ B) $-8/27$ C) $-2/3$ D) $3/2$
16. Which list is in order from smallest to largest?
 A) $-0.5, -1/3, 0.25, 1/2$
 B) $-1/3, -0.5, 0.25, 1/2$
 C) $0.25, -1/3, -0.5, 1/2$
 D) $-0.5, -1/3, 1/2, 0.25$
17. Which decimal is equal to $3/8$?
 A) 0.38 B) 0.0375 C) 3.8 D) 0.375
18. The price of 1 kg of flour rose from 40 AFN to 50 AFN. What was the percentage increase?
 A) 10% B) 25% C) 50% D) 20%
19. Simplify: $3x + 5 - x + 2$
 A) $2x + 7$ B) $9x$ C) $2x + 3$ D) $4x + 7$
20. Solve: $5x - 7 = 2x + 8$
 A) $x = 3$ B) $x = 5$ C) $x = 15$ D) $x = 1/3$
21. The Venn diagram shows the subjects liked by 30 students. How many students like NEITHER Mathematics NOR Science?



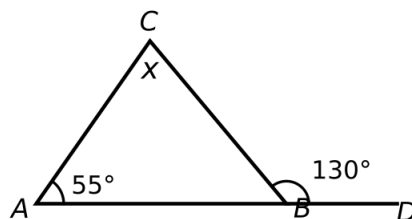
- A) 0 B) 3 C) 4 D) 11
22. In the figure, lines m and n are parallel. What is the value of y ?



- A) 65° B) 130° C) 115° D) 25°

23. Two straight lines intersect. One angle is 70° and the angle vertically opposite to it is $(3x + 10)^\circ$. What is x ?
 A) 20 B) 30 C) 50 D) 60

24. In triangle ABC, side AB is extended to D. What is the value of x ?



- A) 185° B) 50° C) 75° D) 55°
25. In an isosceles triangle, each base angle is 70° . What is the third angle?
 A) 40° B) 110° C) 55° D) 70°
26. What is the sum of the interior angles of a hexagon?
 A) 540° B) 1080° C) 720° D) 360°
27. Each exterior angle of a regular polygon is 36° . How many sides does it have?
 A) 5 B) 8 C) 10 D) 36
28. The point where the three medians of a triangle meet is called the:
 A) circumcentre B) orthocentre
 C) incentre D) centroid
29. Where do the three altitudes (or their extensions) of an obtuse-angled triangle meet?
 A) at the midpoint of the longest side
 B) inside the triangle
 C) at the vertex of the obtuse angle
 D) outside the triangle
30. Which three lengths can be the sides of a triangle?
 A) 5 cm, 5 cm, 10 cm B) 4 cm, 7 cm, 10 cm
 C) 2 cm, 6 cm, 9 cm D) 3 cm, 4 cm, 8 cm
31. The midpoints of the four sides of a rectangle (that is not a square) are joined in order. What shape is always formed?
 A) rhombus B) trapezium
 C) rectangle D) square
32. Which variable is a discrete quantitative variable?
 A) the favourite colour of a student
 B) the height of a student
 C) the number of people in a family
 D) the temperature in Herat at noon
33. The table shows the scores in a quiz. What is the mode of the scores?

Mathematics quiz scores in Class 7A

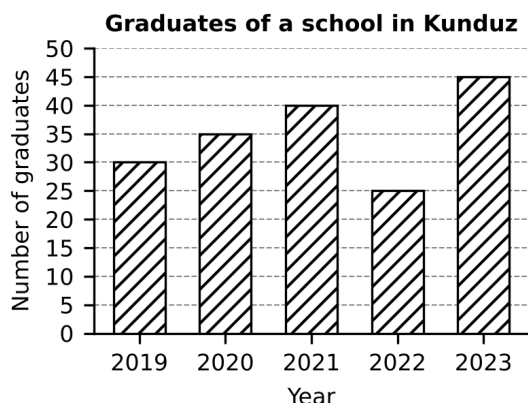
Score	14	15	16	17	18
Number of students	3	5	8	4	2

- A) 8 B) 15 C) 16 D) 18
34. What is the median of 4, 9, 2, 7, 5, 8?
 A) 7 B) 6 C) 5.5 D) 5.8
35. If every number in a data set is multiplied by 3, what happens to the mean?
 A) It increases by 3.
 B) It is divided by 3.
 C) It does not change.
 D) It is multiplied by 3.

36. Nooria's mean mark in 7 subjects is 18. She then gets 12 and 15 in two more subjects. What is her new mean mark for all 9 subjects?

A) 17 B) 15 C) 13.5 D) 18

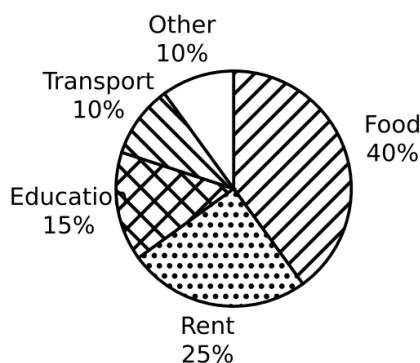
37. The bar chart shows the number of graduates of a school. By what percentage did the number of graduates increase from 2022 to 2023?



A) 180% B) 20% C) 80% D) 44%

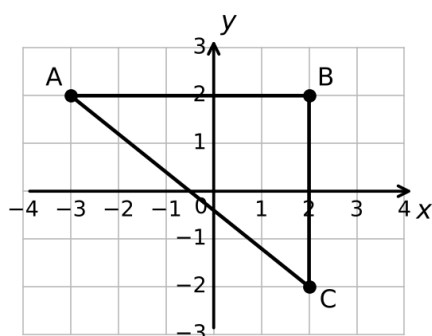
38. The pie chart shows how a family spends 24,000 AFN each month. How much do they spend on education?

**Monthly spending of a family
(total 24,000 AFN)**



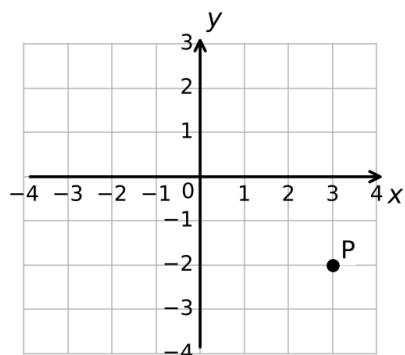
A) 2,400 AFN B) 3,600 AFN
C) 9,600 AFN D) 6,000 AFN

39. What is the area of triangle ABC on the grid? (Each square is 1 unit by 1 unit.)



A) 12 square units B) 9 square units
C) 20 square units D) 10 square units

40. Point P is reflected in the y-axis. What are the coordinates of its image?



A) (-2, 3) B) (-3, 2) C) (3, 2) D) (-3, -2)

41. Each interior angle of a regular polygon is 140° . How many sides does the polygon have?

A) 7 B) 9 C) 10 D) 14

42. A father is 4 times as old as his son. In 5 years, the father will be 3 times as old as his son. How old is the son now?

A) 15 years B) 5 years C) 40 years D) 10 years

43. A set has 5 elements. How many of its subsets have exactly 3 elements?

A) 8 B) 10 C) 15 D) 32

44. The sum of three consecutive whole numbers is 72. What is the largest of the three numbers?

A) 23 B) 24 C) 25 D) 26

45. In a class, $\frac{3}{5}$ of the students are girls. $\frac{1}{3}$ of the girls and $\frac{1}{2}$ of the boys walk to school. What fraction of the whole class walks to school?

A) $\frac{1}{5}$ B) $\frac{1}{3}$ C) $\frac{5}{6}$ D) $\frac{2}{5}$

Physics (Questions 46–60)

46. Which of these is an SI base (fundamental) quantity?

A) force B) area C) mass D) speed

47. What is the SI unit of electric current?

A) watt B) volt C) ampere D) ohm

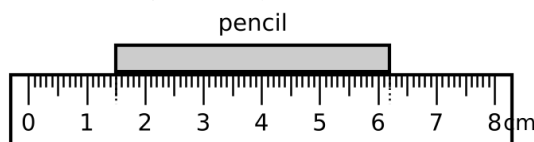
48. How many seconds are there in 2.5 hours?

A) 150 s B) 9,000 s C) 15,000 s D) 2,500 s

49. A floor tile has an area of 3 m^2 . What is its area in cm^2 ?

A) $30,000 \text{ cm}^2$ B) 300 cm^2
C) $300,000 \text{ cm}^2$ D) $3,000 \text{ cm}^2$

50. What is the length of the pencil shown?



A) 4.2 cm B) 7.7 cm C) 6.2 cm D) 4.7 cm

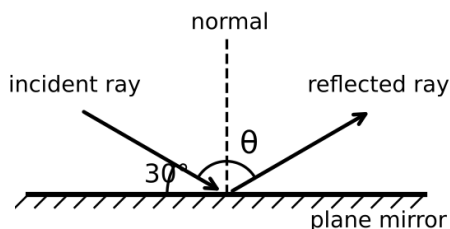
51. A book has 400 pages, printed on both sides of each sheet. Without its covers, the book is 2 cm thick. What is the thickness of one sheet of paper?

A) 0.5 mm B) 0.05 mm C) 0.1 mm D) 1 mm

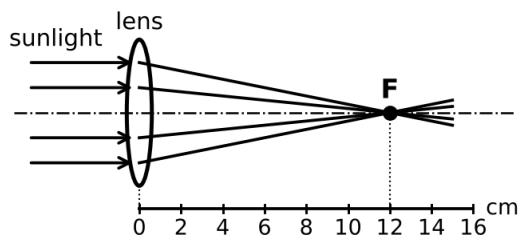
52. Which observation shows that light travels in straight lines?

A) Light is reflected by mirrors.
B) Sharp shadows form behind objects.
C) White light can be split into colours.
D) Light can travel through empty space.

53. A ray of light strikes a plane mirror. The angle between the ray and the surface of the mirror is 35° . What is the angle of reflection?
A) 55° **B)** 35° **C)** 110° **D)** 70°
54. Ahmad stands 1.5 m in front of a plane mirror. What is the distance between Ahmad and his image?
A) 1.5 m **B)** 3 m **C)** 0.75 m **D)** 6 m
55. In the diagram, the incident ray makes an angle of 30° with the mirror. What is the angle θ between the incident ray and the reflected ray?



- A)** 30° **B)** 90° **C)** 120° **D)** 60°
56. The word AMBULANCE is written back-to-front on the front of an ambulance. Why?
A) A plane mirror image is laterally inverted, so drivers ahead read it correctly in their mirrors.
B) Plane mirrors make images larger.
C) Plane mirrors form real images on the road.
D) Plane mirrors make images upside down.
57. Which mirror can form a real image of a distant mountain on a screen?
A) a plane mirror
B) a flat sheet of glass
C) a convex mirror
D) a concave mirror
58. Convex mirrors are placed at sharp bends on mountain roads. What is the main reason?
A) They focus sunlight to warm the road.
B) They give a wider field of view.
C) They make cars look larger and closer.
D) They form real images on the road.
59. Parallel rays of sunlight pass through a convex lens as shown. What is the focal length of the lens?



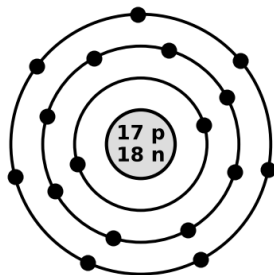
- A)** 16 cm **B)** 6 cm **C)** 24 cm **D)** 12 cm
60. A convex lens forms an image of an insect with a magnification of 1.5. The insect is 2 cm long. How long is the image?
A) 0.75 cm **B)** 3.5 cm **C)** 1.3 cm **D)** 3 cm

Chemistry (Questions 61–75)

61. Which particles are found in the nucleus of an atom?
A) protons and electrons
B) electrons and neutrons
C) protons and neutrons
D) only electrons

62. Rutherford's gold-foil experiment showed that:
A) an atom is a solid ball with no empty space
B) the nucleus has a negative charge
C) an atom is mostly empty space with a small, dense, positive nucleus
D) electrons are found inside the nucleus
63. Which statement is ALWAYS true for a neutral atom?
A) The mass number equals the number of electrons.
B) The number of protons equals the number of neutrons.
C) The number of neutrons equals the number of electrons.
D) The number of protons equals the number of electrons.
64. A sodium atom has a mass number of 23 and an atomic number of 11. How many neutrons does it have?
A) 11 **B)** 12 **C)** 23 **D)** 34
65. Which particle has the smallest mass?
A) electron **B)** nucleus **C)** neutron **D)** proton
66. A chlorine atom has a mass number of 35 and contains 18 neutrons. How many protons and electrons does the neutral atom have?
A) 17 protons and 17 electrons
B) 17 protons and 18 electrons
C) 35 protons and 35 electrons
D) 18 protons and 17 electrons
67. The maximum number of electrons in shell n is $2n^2$. What is the maximum number of electrons the third shell ($n = 3$) can hold?
A) 6 **B)** 8 **C)** 9 **D)** 18
68. Magnesium has 12 electrons. What is its electron arrangement?
A) 2, 2, 8 **B)** 2, 10 **C)** 8, 2, 2 **D)** 2, 8, 2
69. Aluminium has atomic number 13. How many electrons are in its outer (valence) shell?
A) 1 **B)** 3 **C)** 5 **D)** 13
70. Carbon-12 and carbon-14 are isotopes. How are their atoms different?
A) They have different numbers of protons.
B) One is an atom and the other is an ion.
C) They have different numbers of electrons.
D) They have different numbers of neutrons.
71. The modern periodic table arranges elements in order of increasing:
A) atomic number **B)** date of discovery
C) atomic mass **D)** number of neutrons

72. The diagram shows the electron arrangement of a chlorine atom. What is this atom most likely to do in a reaction?



- A) gain 1 electron to form an ion with a 1– charge
 B) lose 1 electron to form an ion with a 1+ charge
 C) lose 7 electrons to form an ion with a 7+ charge
 D) gain 7 electrons to form an ion with a 7– charge
73. The diagram shows part of the periodic table with four elements W, X, Y and Z. Which element is in Period 3 and has 7 electrons in its outer shell?

Group	1	2	13	14	15	16	17	18
Period 1								
Period 2		W					Z	
Period 3		Y					X	

- A) W B) X C) Y D) Z
74. Why do lithium, sodium and potassium have similar chemical properties?
- A) They have the same number of neutrons.
 B) They have the same mass number.
 C) They have the same number of electrons in their outer shell.
 D) They are all in the same period.
75. Four reactions were carried out in water. The table shows the temperature of each mixture. Which reaction is endothermic?

Reaction	Starting temp. (°C)	Final temp. (°C)
1	20	35
2	20	12
3	20	27
4	20	41

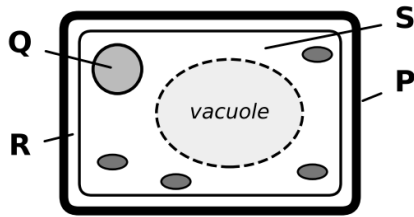
- A) 1 B) 2 C) 3 D) 4

Biology (Questions 76–90)

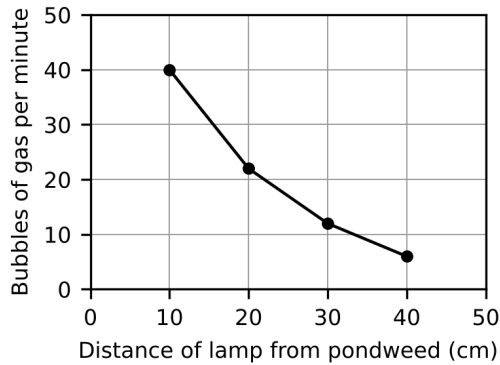
76. In the scientific name *Panthera pardus* (leopard), the word *Panthera* is the name of the:
- A) family B) kingdom C) genus D) species
77. Which feature shows that an organism is a prokaryote?
- A) Its cells have a cell wall.
 B) Its cells have no nucleus.
 C) It makes its own food.
 D) It is made of many cells.
78. Which statement about bacteria is correct?
- A) Some bacteria are useful, for example in making yoghurt.
 B) Bacteria cells are larger than plant cells.
 C) All bacteria cause disease.
 D) Bacteria cells have a nucleus.

79. What causes malaria?
- A) a fungus that grows on bread
 B) a protist (Plasmodium) carried by mosquitoes
 C) a bacterium found in old food
 D) a virus spread through dirty water
80. Green-grey mould growing on old bread is an example of a:
- A) plant B) bacterium
 C) fungus D) virus
81. Why are fungi NOT classified as plants?
- A) They do not have cells.
 B) They are always single-celled.
 C) They cannot reproduce.
 D) They have no chlorophyll and cannot make their own food.
82. Which statement correctly compares an apricot tree and a pine tree?
- A) Both are angiosperms with seeds inside fruits.
 B) The apricot is an angiosperm with seeds inside a fruit; the pine is a gymnosperm with seeds in cones.
 C) The apricot is a gymnosperm; the pine is an angiosperm.
 D) Neither of them produces seeds.
83. Wheat is a monocot (monocotyledon) plant. Which feature would you expect its leaves to have?
- A) needle-shaped leaves B) no veins
 C) net-like veins D) parallel veins
84. Which list shows the levels of organisation in a body from simplest to most complex?
- A) organ → tissue → cell → organ system
 B) cell → organ → tissue → organ system
 C) cell → tissue → organ → organ system
 D) tissue → cell → organ → organ system
85. Oxygen moves from the air sacs of the lungs into the blood by diffusion. Why does it move in this direction?
- A) Oxygen always moves downward.
 B) The oxygen concentration is higher in the air sacs than in the blood.
 C) The blood pushes oxygen into itself.
 D) The oxygen concentration is higher in the blood than in the air sacs.
86. Dried raisins placed in water for a few hours become swollen. What is the best explanation?
- A) The raisins carry out photosynthesis in water.
 B) Sugar from the water enters the raisins.
 C) Air enters the raisins by diffusion.
 D) Water enters the raisin cells by osmosis.
87. Which word equation describes photosynthesis?
- A) glucose + oxygen → carbon dioxide + water
 B) glucose + water → oxygen + carbon dioxide
 C) oxygen + water → glucose + carbon dioxide
 D) carbon dioxide + water → glucose + oxygen
88. Why do the roots of a carrot plant NOT carry out photosynthesis?
- A) They take in oxygen instead of water.
 B) They have too much water.
 C) They are underground with no light, and they have no chloroplasts.
 D) They have no cells.

89. The diagram shows a plant cell. Which labelled part is NOT found in animal cells?



- A) P B) Q C) R D) S
90. A lamp was placed at different distances from a pondweed, and the gas bubbles were counted. Which conclusion is best supported by the graph?



- A) The closer the lamp, the faster the rate of photosynthesis.
B) The distance of the lamp has no effect on photosynthesis.
C) The pondweed does not need light to make the gas.
D) The pondweed produces more gas when the lamp is farther away.
- End of test.** Check that every answer is marked on your answer sheet.