MARK SCHEME	نموذج الإجابة وتوزيع الدرجات
KINGDOM OF BAHRAIN	مملكة البحرين
EDUCATION & TRAINING QUALITY AUTHORITY	هيئة جودة التعليم والتدريب
Directorate of National Examinations	إدارة الامتحانات الوطنية
Grade 12 National Examinations	الامتحانات الوطنية للصف الثاني عشر
Mathematical Skills 2024	**امتحان المهارات الرياضية ٢٠٢٤**

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the National Examinations. It shows the basis for awarding marks.

Mark schemes must be read in conjunction with the question papers and Marking reports.

<table>
<tr><td rowspan="5">1</td><td>Key</td><td>C</td><td>The highest temperature is in July and is 50° C, and the lowest is in December and is 10° C.
Therefore, the difference between the highest and lowest temperature is 40° C (50 – 10)</td></tr>
<tr><td colspan="3">Distractors</td></tr>
<tr><td>A</td><td colspan="2">Calculating the difference between the highest temperature and lowest temperature for July only.</td></tr>
<tr><td>B</td><td colspan="2">Calculating the difference between the highest temperature and lowest temperature for December only.</td></tr>
<tr><td>D</td><td colspan="2">Calculating the difference between the highest temperature, which is 50° C, and lowest temperature in the chart 0° C.</td></tr>
<tr><td rowspan="5">2</td><td>Key</td><td>C</td><td>Since the difference between the number of people who got on and off the train between the first and last stations is 26 (40 – 14) passengers, and since the number of passengers decreases in every station by 2 (10 – 8), the number of stations between the first and last stations is 13 (26 ÷ 2) stations. Therefore, the total number of train stations is 15 (13 + 2) stations.</td></tr>
<tr><td colspan="3">Distractors</td></tr>
<tr><td>A</td><td colspan="2">Failure to add the first and last stations.</td></tr>
<tr><td>B</td><td colspan="2">Failure to add the first or last station.</td></tr>
<tr><td>D</td><td colspan="2">Forgetting that all the remaining 14 passengers got off the train in the last station.</td></tr>
<tr><td rowspan="5">3</td><td>Key</td><td>C</td><td>The number of bottles produced per week:
<table>
<tr><td>Week</td><td>First</td><td>Second</td><td>Third</td><td>Fourth</td><td>Fifth</td></tr>
<tr><td>Number of Bottles</td><td>1000</td><td>1500</td><td>2000</td><td>3000</td><td>3000</td></tr>
</table>
Which can be represented as shown in the figure.</td></tr>
<tr><td colspan="3">Distractors</td></tr>
<tr><td>A</td><td colspan="2">Considering the total production in the fourth and fifth weeks to be 3000 bottles instead of 2500 in each.</td></tr>
<tr><td>B</td><td colspan="2">Represents the production in the second and third weeks inversely.</td></tr>
<tr><td>D</td><td colspan="2">Considering the factory’s production in the third week to be double its production in the second week instead of the first week.</td></tr>
</table>

4	**Key**	**C**	To determine the greatest number of days, we assume that each bag contains 37 candies, and that Ali eats only 5 pieces every day. Therefore, Ali has 111 candies in 3 bags (37 x 3), thus the number of days in which he can east 5 candies is 22 days. (111 ÷ 5 = 22) with one piece left with him.
	Distractors		
	A	Considering that there is only one bag of candy.	
	B	Considering that each bag contains only 35 candies.	
	D	Adding a day in which Ali eats the remaining piece.	
5	**Key**	**D**	By filling in the equation with the known numbers, the result will be 2 (0 + 0 + 6 + 9) + 0 + 8 + 3 + X = 41 + X The number that can be added to 41 to make it divisible by 10 is 9, which makes it 50.
	Distractors		
	A	41 is greater than 40 by 1.	
	B	Adding without multiplying by 2 for odd digits.	
	C	Adding the first four numbers and multiplying them by 2, then adding the remaining numbers.	
6	**Key**	**C**	By examining the question, we will find that there were 8 pieces to start with, of which Hassan ate 4. His mother then added 12 pieces, making the total number of pieces 16, of which Hassan ate 8. Therefore, the total number of pieces Hassan ate is: 4 + 8 = 12
	Distractors		
	A	This represents the number of candies at the beginning and the end.	
	B	This represents half the total number of candies.	
	D	This represents the total number of candies (8 + 12).	

7	**Key**	**B**	The minimum calories for a moderately active 20-year-old person is: 2600 × 30 = 78000
	Distractors		
	A	The calories for an inactive 20-year-old person is: 2400 × 30 = 72000	
	C	The average calories for a moderately active 20-year-old person is: 2700 × 30 = 81000	
	D	The maximum calories for a moderately active 20-year-old person is: 2800 × 30 = 84000	
8	**Key**	**D**	Since Hammed has visited all the branches at least once, we can subtract the total times spent to and from these branches (150 min), to calculate the total times spent in the remaining three days of the week as follows: 300 – 150 = 150 (min) Therefore, the average time is 50 min per day, and the only branch that Hammed could have visited is the fourth branch. Accordingly, the number of times Hammed has visited the fourth branch is 4 times. [35 × (1)] + [40 × (1)] + [25 × (1)] + [50 × (4)] = 300 min
	Distractors		
	A	See above.	
	B	See above.	
	C	See above.	

9	**Key**	**B**	The required volume of juice is 140 x 0.2 = 28 Liters. Buying one type A juice, one type B juice and type C juices. The minimum cost is: 11 + 3 + 3 × 0.8 = BD 16.400
	Distractors		
	A	Buying one juice of each type. 11 + 3 +0.8 = 14.800 But, the quantity of juice is not enough.	
	C	Buying one type A juice and two type B juices. 11 + 3 + 3 = BD 17 But, this is not the minimum cost.	
	D	Buying two type A juices. 11 × 2 = BD 22 But, this is not the minimum cost.	
10	**Key**	**B**	The discount price for the first category is 3 x 20 = BD 60 The discount price for the second category is 5 x 10 = BD 50 The discount price for the third category is 7 x 5 = BD 35 The total is 60 + 50 + 35 = BD 145
	Distractors		
	A	Did not calculate the discount for the third category The total is 60 + 50 = 110	
	C	Miscalculated the discount for the second category (instead of 25%, 75% was calculated) 5×30 = 150 The total is 60 + 150 + 35 = 245	
	D	Calculating the amount received by the institute, rather than the saving made by the society (15×40) – 145 = 455	

<table>
<tr><td rowspan="8">11</td><td>Key</td><td>D</td><td>This is the graphic representation reflects the number of vacant seats in the six training courses:
<table>
<tr><th></th><th colspan="3">Hall No. 1</th><th colspan="3">Hall No. 2</th></tr>
<tr><th>Course No.</th><th>1</th><th>3</th><th>5</th><th>2</th><th>4</th><th>6</th></tr>
<tr><th>No. Of Reregistered Participants</th><td>35</td><td>40</td><td>33</td><td>28</td><td>37</td><td>33</td></tr>
<tr><th>No. of Vacant Seats</th><td>15</td><td>10</td><td>17</td><td>12</td><td>3</td><td>7</td></tr>
</table></td></tr>
<tr><td colspan="3">Distractors</td></tr>
<tr><td>A</td><td colspan="2">This is a representation of the number of registered participants in the six training courses.</td></tr>
<tr><td>B</td><td colspan="2">This representation considers that the numbers of courses in Hall No. 1 are: 1, 2 and 3, and that the numbers of courses in Hall No. 2 are: 4, 5 and 6.</td></tr>
<tr><td>C</td><td colspan="2">This is a representation of the number of vacant seats, considering that the two halls can accommodate forty trainees.</td></tr>
<tr><td rowspan="4">12</td><td>Key</td><td>B</td><td>The sale price offered by the merchants is BD 1800 (1500 x 1.2).
The price at which the item was sold is: BD 1620 (1800 x 0.9).</td></tr>
<tr><td colspan="3">Distractors</td></tr>
<tr><td>A</td><td colspan="2">Considering the discount to be 20%, and the added amount to be 10%.
1500 × 0.8 = 1200 , 1200 × 1.1 = 1320</td></tr>
<tr><td>C</td><td colspan="2">Forgetting to factor in the 10% discount.</td></tr>
<tr><td></td><td>D</td><td colspan="2">Adding 10% instead of subtracting it.
1500 × 1.2 = 1800 , 1800 × 1.1 = 1980</td></tr>
<tr><td rowspan="4">13</td><td>Key</td><td>A</td><td>There are two small equal segments, two more equal segments and a fifth segment that is larger the other 4 segments.</td></tr>
<tr><td colspan="3">Distractors</td></tr>
<tr><td>B</td><td colspan="2">The largest and smallest sectors combined make half the pie chart.</td></tr>
<tr><td>C</td><td colspan="2">The two medium segments combined make more than half the pie chart.</td></tr>
<tr><td></td><td>D</td><td colspan="2">The first and second segments are swapped.</td></tr>
</table>

14	**Key**	**B**	The remaining amount is BD 685 (1000 – (120 × 2 × 0.75 + (155 – 20))) The maximum amount to spend is 660 (medium-sized seating made of velvet)
	Distractors		
	A	Forgetting to factor in the 25% discount on curtains.	
	C	Factoring in the 25% discount on the carpet.	
	D	Calculating the cost of buying one curtain only.	
15	**Key**	**A**	The cost of one tonne of steel the first time: 292.5 ÷ 1.25 = BD 234.000 The cost of one tonne of steel the second time: 193.05 ÷ 0.75 = BD 257.400 The difference between the two prices: 257.4 – 234 = BD 23.400 i.e. the change in the price of steel was in increase equal to: 23.4 ÷ 234 = 10%
	Distractors		
	B	Correctly calculating the difference between the two prices, but miscalculating the percentage by dividing the difference by the price in the second time.	
	C	Calculating the difference between the two prices paid by Ahmed without calculating the cost per tonne, then dividing the resulting amount by BD 292.500	
	D	Calculating the difference between the two prices paid by Ahmed without calculating the cost per tonne, then dividing the resulting amount by BD 193.050	

<table>
<tr><td rowspan="5">16</td><td>Key</td><td>C</td><td>The minimum cost that Adel will pay the restaurant will be reached if he orders:
A dish of Meat Pasta or Meat Masala for the cost of BD 1.700 for himself.
A dish of Vegetable or Chicken pasta for the cost of BD 1.500 for his wife.
A dish of lentils Masala for the cost of BD 0.800 for his son.
A dish of Chicken Pasta for the cost of BD 1.500 for his two daughters.
5 juices for the cost of BD 5.000
The total cost is:
1.7 + 1.5 + 0.8 + 1.5 + 5 = BD 10.500
After the discount, he will pay the restaurant:
10.5 × 0.75 = BD 7.875.</td></tr>
<tr><td colspan="3">Distractors</td></tr>
<tr><td>A</td><td colspan="2">Multiplying the total cost by 0.25 instead of 0.75</td></tr>
<tr><td>B</td><td colspan="2">Failure to add the amount paid for juice.</td></tr>
<tr><td>D</td><td colspan="2">The total cost before discount.</td></tr>
<tr><td rowspan="6">17</td><td>Key</td><td>D</td><td>The table below shows the average temperatures in each month after subtracting the two incorrectly measured degrees:<table><tr><th>Month</th><th>Average Temperature (C)</th></tr><tr><td>1</td><td>31º</td></tr><tr><td>2</td><td>34º</td></tr><tr><td>3</td><td>39º</td></tr><tr><td>4</td><td>33º</td></tr></table></td></tr>
<tr><td colspan="3">Distractors</td></tr>
<tr><td>A</td><td colspan="2">Representing all days, not the average.</td></tr>
<tr><td>B</td><td colspan="2">Representing average temperatures and forgetting to subtract the two incorrectly measured degrees.</td></tr>
<tr><td>C</td><td colspan="2">Representing average temperatures and adding the two incorrectly measured degrees instead of subtracting them.</td></tr>
</table>

<table>
<tr><td rowspan="5">18</td><td>Key</td><td>B</td><td>19 correct answers will result in at least 95
If there are 18 correct answers, the result will be 90, and a maximum of two additional points will be received (if the two remaining questions are not answered).
If the number of correct answers is less than 18, the result will be less than 90 and a result of 93 will be impossible.</td></tr>
<tr><td colspan="3">Distractors</td></tr>
<tr><td>A</td><td colspan="2">18 correct answers, with two questions unanswered.</td></tr>
<tr><td>C</td><td colspan="2">19 correct answers and one wrong answer.</td></tr>
<tr><td>D</td><td colspan="2">19 correct answers and one question unanswered.</td></tr>
<tr><td rowspan="5">19</td><td>Key</td><td>B</td><td>The following table shows the number of cars assembled per day:
<table>
<tr><th>No. of Cars Assembled</th><th>Type</th><th>No. of Working Hours</th><th>Worker</th></tr>
<tr><td>6</td><td>First</td><td rowspan="2">6</td><td rowspan="2">Dawoud</td></tr>
<tr><td>3</td><td>Second</td></tr>
<tr><td>8</td><td>First</td><td rowspan="2">4</td><td rowspan="2">Suleiman</td></tr>
<tr><td>4</td><td>Second</td></tr>
</table>
Suleiman assembles a total of 21 toy cars of both types per day. Therefore, the total number of cars of both types assembled in four days is: 84 cars.</td></tr>
<tr><td colspan="3">Distractors</td></tr>
<tr><td>A</td><td colspan="2">The productivity of one day only (see above).</td></tr>
<tr><td>C</td><td colspan="2">Forgetting the break hours of one of the workers.</td></tr>
<tr><td>D</td><td colspan="2">The working hours of Dawoud and Suleiman should be the other way around.</td></tr>
</table>

20	**Key**	**A**	The correct representation of all stages.
	Distractors		
	B	Unsteady speed in the third stage.	
	C	Lack of representation of the second stage.	
	D	Lack of representation of the fifth stage.	
21	**Key**	**B**	Sarah fills the jars with a 3:5 ratio, which definitely makes the number of marbles in each jar divisible by 8. The empty space in each jar is: 3 marbles in Jar 1, 5 in Jar 2, 1 in jar 3 and none in jar 4. Therefore, jar 2 has the largest possible empty space.
	Distractors		
	A	See above.	
	C	See above.	
	D	See above.	
22	**Key**	**C**	Possible numbers: 7935, 7395, 3715, 3175.
	Distractors		
	A	Since it is a PIN number, it must be a single number.	
	B	Writing 3175 and 7395 and forgetting to reverse the middle two numbers.	
	D	Forgetting that the numbers must be different.	

23	**Key**	**C**	In order for Moneer to buy the largest number of glasses from all types, he has to buy the following: • One glass of juice of the (Magician) type (BD 0.700) • One glass of Mango juice (BD 0.400) • 7 glasses of Banana juice (BD 1.000) • 3 glasses of Saffron juice (BD 0.600) • One glass of Avocado juice (BD 0.300) • One glass of Layers juice (BD 1.000) • 30 glasses of Watermelon juice (BD 3.000) bringing the total to 44 glasses.
	Distractors		
	A		• One glass of juice of the (Magician) type (BD0.700) • 3 glasses of Mango juice (BD 0.400) • 7 glasses of Banana juice (BD 1.000) • 6 glasses of Saffron juice (BD 0.600) • One glass of Avocado juice (BD 0.300) • One glass of Layers juice (BD 1.000) • 20 glasses of Watermelon juice (BD 2.000) bringing the total to 39 glasses but not the largest number.
	B	Buying all glasses from the second offer only.	
	D	Buying all glasses from the watermelon type of juice.	
24	**Key**	**C**	The tyre was made in the fourth week of December 2017. Therefore, the remaining period for storing the tyres from the date of production until the beginning of the fourth week of January 2021 is 3 years and four weeks.
	Distractors		
	A	Calculating the period from the end of 2018.	
	B	Forgetting to add the weeks.	
	D	Calculating the period from the beginning of 2017.	

<table>
<tr><td rowspan="8">25</td><td>Key</td><td>C</td><td>The total amount sold every day is shown in the table below:
<table><tr><th>Day</th><th>Amount Sold (L)</th></tr><tr><td>1</td><td>35000</td></tr><tr><td>2</td><td>33000</td></tr><tr><td>3</td><td>33900</td></tr><tr><td>4</td><td>38600</td></tr></table>
The total amount sold per fuel type for the days in which the amount sold did not exceed 35000 L and the respective total sale prices are shown in the table below:
<table><tr><td>Fuel</td><td>Amount Sold (L)</td><td>Price (BD)</td></tr><tr><td>Super gasoline</td><td>5300</td><td>1245.5</td></tr><tr><td>Mumtaz (Premium) gasoline</td><td>11100</td><td>2220</td></tr><tr><td>Jayyid (Regular) Gasoline</td><td>81000</td><td>11340</td></tr><tr><td>Diesel</td><td>4500</td><td>810</td></tr><tr><td colspan="2">Total (BD)</td><td>15615.5</td></tr></table></td></tr>
<tr><td colspan="3">Distractors</td></tr>
<tr><td>A</td><td colspan="2">Station’s total revenue from the sale of fuel in days in which the amount sold exceeded 35000 L.</td></tr>
<tr><td>B</td><td colspan="2">Revenues were not calculated for the day when the amount of fuel sold was equal to 35000 L.</td></tr>
<tr><td>D</td><td colspan="2">Station’s total revenue from the sale of fuel in all days.</td></tr>
<tr><td rowspan="5">26</td><td>Key</td><td>B</td><td>The tens and hundreds digits in the page 560 are 56. Reversing the operations by dividing by 2 then adding 1, we arrive at the probability of Part 29 (56 ÷ 2 + 1)
However, the ones digits of page numbers start with 2, and part 29 starts from page 562. Therefore, page 560 is in part 28.</td></tr>
<tr><td colspan="3">Distractors</td></tr>
<tr><td>A</td><td colspan="2">See above.</td></tr>
<tr><td>C</td><td colspan="2">See above.</td></tr>
<tr><td>D</td><td colspan="2">See above.</td></tr>
</table>

27	**Key**	**D**	Sameer's days of attendance in June for six years (by multiplying the attendance rate by 30, then subtracting the days of monthly leaves) are, in order, as follows: 13, 7, 10, 19, 16, 13 And this is the only chart that represents these numbers.
	Distractors		
	A	This chart represents the days of absence with the days of leave.	
	B	This chart represents the worker's days of absence.	
	C	Forgetting to exclude the days of monthly leave.	
28	**Key**	**C**	Each group plays 10 matches (1+2+3+4) For a total of 80 matches Therefore, if one team is absent from a group, the total number of matches will decrease by 4 matches; if two teams are absent from a group, the total number of matches will decrease by 7 matches and if 3 teams are absent from a group, the total number of matches will decrease by 9 matches. By systematic research of the number of teams that were absent from the league, we find the following options: First Option: One team was absent from each group (4 x 8 = 32), the number of teams is 8. Second Option: Two teams were absent from 4 groups and only one team was absent from another group (7 x 4 + 4 x 1 = 32), the number of teams is 9. Third Option: 3 teams were absent from one group, two teams were absent from another group, and one team was absent from 4 groups (9 x 1 + 7 x 1 + 4 x 4 = 32), the number of teams is 9. Fourth Option: 3 teams were absent from two groups and two teams were absent from two other groups (9 x 2 + 7 x 2 = 32), the number of teams is 10.
	Distractors		
	A	See above.	
	B	See above.	
	D	Completing the pattern.	

29	**Key**	**A**	The amount that any student will pay to buy 110 roses on her own from the flower shop is BD 54 (100 x 0.500 + 10 x 0.400) When three students buy all the roses (330 roses) with a single invoice from the flower shop, they will pay the shop BD 129 (100 x 0.500 + 100 x 0.400 + 130 x 0.300) When this amount is equally divided among them, each student will pay BD 43. Therefore, the amount each one of them will save is BD 11 (54 – 43).
	Distractors		
	B	Considering the price per rose for all roses to be BD 0.300.	
	C	The amount saved by all students.	
	D	Buying 110 instead of 330 roses by all students.	
30	**Key**	**D**	Since Hassan went to Showroom Y in both days, we can conclude the following: • In one of the two days, Ali and Mohammad went to Showroom X, while Fahad, Saud and Hassan went to Showroom Y. • In the other day, Ali and Hassan went to Showroom Y, while Mohammad, Fahad and Saud went to Showroom X. Therefore, Mohammad was the one (other than Hassan) who went to the same showroom in both days, which is Showroom X.
	Distractors		
	A	See above.	
	B	See above.	
	C	See above.	