**Study: Assessing the level of numeracy skills in type 1 diabetic children and their caregivers and to ascertain an association with diabetes control.**

**Questionnaire-Demographics**

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Number</td>
<td></td>
</tr>
<tr>
<td>Date of birth / Age</td>
<td></td>
</tr>
<tr>
<td>Base hospital</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td></td>
</tr>
<tr>
<td>School</td>
<td></td>
</tr>
<tr>
<td>Current grade / grade attained</td>
<td></td>
</tr>
<tr>
<td>Have you had to repeat a grade? If yes, which grade?</td>
<td></td>
</tr>
<tr>
<td>Duration of diabetes</td>
<td></td>
</tr>
<tr>
<td>Average HbA1c level</td>
<td></td>
</tr>
<tr>
<td>Insulin regimen</td>
<td></td>
</tr>
<tr>
<td>Meal plan</td>
<td></td>
</tr>
<tr>
<td>Diabetes complications</td>
<td></td>
</tr>
</tbody>
</table>
Basic Mathematical Skills (sections arranged according to equivalent grades)

SECTION 1

Question 1
Complete the following sequence:
10, ____, ____, 40, 50, ____, ____, ____, 90, ____

Question 2
Write the following numbers in words:
1  __________
5  __________
20 __________
26 __________

Question 3
What are the following shapes:

Question 4
Calculate the following:
1 + 2 = _____
4 + 5 = _____
10 + 8 = _____

Question 5
Circle the common objects:
SECTION 2

Question 1
Complete the following sequences:

25, ____, ____, 40, 45, ____, ____, ____., 65

180, 182, ____, ____, ____, 190, 192

Question 2
Circle the correct fraction:

one half ½ ½ ¼
one quarter ¼ ¼ ¼
one third ¾ ¾ ¾

Question 3
Calculate the following:

10 + 14 = ____
5 × 4 = ____
2 × 6 = ____

Question 4
Arrange the following in the correct order:

Monday
Sunday
Friday

Question 5
What time is shown on the following clocks?
Question 6

Group the following:
1) transport vehicles
2) houses

SECTION 3

Question 1

Complete the following:

20, 40, ____, ____, 100

Question 2

If I give you R5 and you buy sweets for R2, how much money do you have left?

Question 3

Calculate the following:

100 + 55 = _____
20 × 10 = _____
50 ÷ 5 = _____
Question 4
Complete the following:

1 hour = ________ minutes
½ min = ________ seconds
1 cm = ________ mm

Question 5
How many days in the week?

List them in the correct order:

Question 6
How many months in one year?

SECTION 4

Question 1
Round off the following to the nearest whole number:

22. 2 = ________
16. 7 = ________
13.4 = ________

Question 2
Complete the following:

25, 20, _____, 10, _____

Question 3
Complete the following fractions:

- $rac{1}{4}$
- $rac{2}{3}$
- $rac{3}{5}$
Question 4
Complete the following:

$25 \times 20 = \underline{\hspace{2cm}}$

$202 + 2 = \underline{\hspace{2cm}}$

---

Question 5

If $5 \times 3 = 15$

Then $15 \div \underline{\hspace{2cm}} = 5$

---

Question 6

Write the following in fraction form:

$1 \div 6 = \underline{\hspace{2cm}}$

$1 \div 8 = \underline{\hspace{2cm}}$

---

Question 7

Draw a box (in 3 dimension)
SECTION 5

Question 1
Complete the following:

255 × 50 = _____
500 ÷ 25 = _____

Question 2
Complete the following sequence:

½, 1, _____, _____, 2½

Question 3
Round off the following to the nearest hour:

22h07 = _________
10h57 = _________

Question 4
Write the following equivalent fractions:

¾ = ½
1½ = 3/2

Question 5
Complete the following:

36 doubled = _______
36 halved = _______

Question 6
Work out the following equation using a calculator:

\( \sqrt{25 \times 100} = \)
Question 7
Calculate the following:

2.5 + 4.5 + 3 = _____

SECTION 6

Question 1
Convert the following into percentages:

60/100 = _______ %
25/100 = _______ %

Question 2
R45.75 is equivalent to _______ cents

Question 3
If I get paid R5 a day, how much do I earn in 2 weeks?

Question 4
Complete the following:

2 × _____ - 8 = 0
5 + 5 - _____ = 8
Diabetes Related Questions

**Question 1**

If 1 CARB = 15g

Then how many CARBS in 60g?
- 45g?
- 75g?

**Question 2**

1 CARB = 1 slice bread
   = 1 fruit
   = 1 biscuit
   = ½ roll
   = 1/3 cup rice
   = 1 small yogurt

How many CARBS in:

2 slices bread + 1 small yogurt + 1 fruit?

**Question 3**

Colour in the equivalent of the fraction on the picture graph:

One half \((1/2)\)

One third \((1/3)\)

One quarter \((1/4)\)

**Question 4**

If \(\frac{1}{2}\) cup cereal = 1 CARB

Then 1 and \(\frac{1}{2}\) cups of cereal equals to how many CARBS?
**Question 5:**

Match the following equivalents:

\[ \frac{3}{4} \text{ can} \]

\[ \frac{1}{4} \text{ can} \]

\[ 1 \text{ full can} \]

---

**Question 7**

Round off the following answers to the nearest even number:

-8 protophone + 3 actrapid = ______ total units of insulin

Rounded off = ______ units

-8 protophone + 5 actrapid = ______ total units of insulin

Rounded off = ______ units

---

**Question 6:**

Round the following numbers to the nearest 10:

-2

-5

-8

-12

-16

-19

---

**Question 8**

If bedtime is at 10pm and supper at 6pm, how many hours after supper is bedtime?

---

**Question 9**

If a snack should be taken 2 hours after breakfast and if breakfast is at 7am, then at what time should the snack be taken?
**Question 10**

If your insulin needs to be taken 30 minutes (half an hour) before breakfast and if breakfast is at 7am, then at what time should your insulin be taken?

**Question 11**

Match the following:

1) Breakfast at 6am  
2) Snack at 10am  
3) Lunch at 1pm  
4) Snack at 3pm  
5) Supper at 6pm

**Question 13**

Place the blood sugar levels in descending order (from highest to lowest):  
17, 22, 5, 31, 3

**Question 14**

Target blood sugar levels should be between 4 and 10. Circle the target values:

<table>
<thead>
<tr>
<th></th>
<th>breakfast</th>
<th>snack</th>
<th>lunch</th>
<th>snack</th>
<th>supper</th>
<th>bedtime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>2</td>
<td>12</td>
<td>14</td>
<td>7</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Day 2</td>
<td>22</td>
<td>4</td>
<td>5</td>
<td>16</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>Day 3</td>
<td>24</td>
<td>3</td>
<td>6</td>
<td>15</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>Day 4</td>
<td>21</td>
<td>26</td>
<td>28</td>
<td>8</td>
<td>30</td>
<td>10</td>
</tr>
</tbody>
</table>

**Question 15**

Using the following formula, round off the answers to the nearest whole number:

\[(\text{Blood sugar} - 6) / 3\]

If blood sugar = 18 then the answer is _______  
rounded value _______  

12  
11  
9
Question 16
If you need to give 3 units of insulin every hour, after 3 hours how many units of insulin will be given?

Question 17
If you need to give 1 unit of insulin for every 10kg of body weight and if you weigh 50kg, then how many units of insulin needs to be given?

Question 19
The following appeared on a food label:

<table>
<thead>
<tr>
<th></th>
<th>Per 100g</th>
<th>Per 50g serving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>9g</td>
<td>4.5g</td>
</tr>
<tr>
<td>CHO</td>
<td>60g</td>
<td>30g</td>
</tr>
<tr>
<td>Fat</td>
<td>3g</td>
<td>1.5g</td>
</tr>
</tbody>
</table>

If every 100g has 60g of CHO and one serving has 50g, then how many grams of CHO are there in one serving?

Question 20
The following were blood glucose readings in a diary. Calculate the average readings using a calculator:

<table>
<thead>
<tr>
<th></th>
<th>Breakfast</th>
<th>Lunch</th>
<th>Supper</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.2</td>
<td>9.9</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>7.6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>15.4</td>
<td>9.5</td>
<td>9.1</td>
<td></td>
</tr>
</tbody>
</table>

Average values

Which time of the day was the average highest?
Which time of the day was the average lowest?
### OUTCOME OF DIABETES RELATED QUESTIONS

<table>
<thead>
<tr>
<th>Question</th>
<th>Skill tested</th>
<th>Score</th>
<th>Grade Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Division</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Addition</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Fractions + graphics</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Multiplication</td>
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</tr>
<tr>
<td>5</td>
<td>Fractions + graphics</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Rounding off</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Rounding off and addition</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Time and subtraction</td>
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</tr>
<tr>
<td>9</td>
<td>Time and addition</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Time and subtraction</td>
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<td></td>
</tr>
<tr>
<td>11</td>
<td>Reading time</td>
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<tr>
<td>12</td>
<td>Ascending order</td>
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<tr>
<td>13</td>
<td>Descending order</td>
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</tr>
<tr>
<td>14</td>
<td>Identification and grouping data</td>
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</tr>
<tr>
<td>15</td>
<td>Formulae and rounding off</td>
<td>5</td>
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<tr>
<td>16</td>
<td>Multiplication</td>
<td>3</td>
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<tr>
<td>17</td>
<td>Multiplication</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Multiplication</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Data extrapolation from tables</td>
<td>4</td>
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</tr>
<tr>
<td>20</td>
<td>Averages and calculator skills</td>
<td>4</td>
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</table>

### OUTCOME OF BASIC MATHS QUESTIONS

<table>
<thead>
<tr>
<th>Section/Grade</th>
<th>Section score</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

### TOTAL SCORE (out of 70)
SCORING SYSTEM (determined according to grade-appropriate skills):

Achieved = 2
Partially achieved (needed prompting) = 1
Not achieved = 0

Total score - Basic maths skills (out of 70) = ☐

- Diabetes related questions (out of 80) = ☐

Final Total (out of 150) = ☐