SECONDARY ENTRANCE ASSESSMENT 2019 SPECIMEN PAPER

MATHEMATICS MARK SCHEME

SECTION I - Correct Response 1 mark

SECTION I
1. Objective: Represent any number up to one million using numerals or word names. Correct Response 304807 in words - three hundred and four thousand eight hundred and seven.
2. Objective: Differentiate between factors and multiples and prime and composite numbers and identify square numbers Correct Response 498
3. Objective: Compare and order decimals up to hundredths. Correct Response 0.12 0.21 1.02 1.2
4. Objective: Calculate the whole given a part as a unit fraction Correct Response 140
5. Objective: Express percentages (e.g. 50%, 25%, 20% and 10%) as decimals (e.g. 0·5, 0·25, 0·2 and 0·1). Correct Response 9% = 0.09
6. Objective: Calculate the square of a number. Correct Response 32 x 4 =128
7. Objective: Solve problems in addition (sum less than 10 000) and subtraction (minuend less than 10 000) Correct Response 2463 + 1029 = 3 492

8. Objective: Divide two, three and four digit numbers by one or two digit divisors with and without remainder.

Correct Response
123

9. Objective: Record money values using decimals.

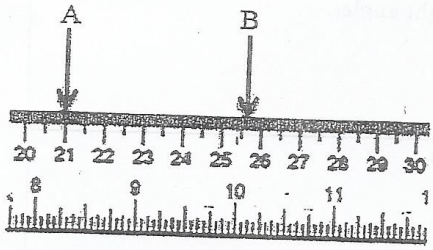
Correct Response
$75.08

10. Objective: Express improper fractions as mixed numbers.

Correct Response
$2\frac{1}{4}$, 2.25

11. Objective: Select and use the most appropriate standard unit for measuring various lengths/distances

Correct Response



12. Objective: Measure and compare the masses/weights of objects in kilograms and grams using a set of scales.

Correct Response
1000 kg – 300 kg = 700 g

13. Objective: Interpret simple time schedules (e.g. the calendar).

Correct Response
8:00 – 6:15 = 1 hr 45 mins
Or 1:45,
Or $1\frac{3}{4}$ hours

14. Objective: State the relationship between the litre and millilitre and convert from one to the other.

Correct Response

$2500 \div 200 = 12.5$

Or $12\frac{1}{2}$

Therefore 12 cups completely filled.

15. Objective: Name the solids with uniform cross-sections.

Correct Response

Cylinder has a uniform cross section.

16. Objective: Describe the properties of solids in relation to number and types of faces, edges and vertices.

Correct Response

Triangular based prism

17. Objective: Identify angles on faces of solids or plane shapes that are right angles, greater than right angles or smaller than right angles.

Correct Response

3 quarter turns, 3

18. Objective: Calculate the mean of a given set of data.

Correct Response

$$\frac{42 + 76 + 87 + 53 + 64 + 92}{6} = 69$$

19. Objective: Determine the mode of a given set of data.

Correct Response

Banana

20. Objective: Apply findings from analysis of data to solve problems.

Correct Response

$17 - 7 = 10$

SECTION 2

21. Objective: Solve one-step problems involving fractions.

- **Alternative Solutions Indicated**

Correct Response: 3 marks

- Using equivalent fractions
  $\frac{1}{4} = \frac{2}{8}$ and $\frac{1}{2} = \frac{4}{8}$
  B is midway $\frac{2}{8}$ and $\frac{4}{8} = \frac{3}{8}$
- $\frac{2}{8} + \frac{4}{8} = \frac{6}{8}$
  $\frac{6}{8} \div 2 = \frac{6}{8} \times \frac{1}{2} = \frac{3}{8}$
- $\frac{1}{4} + \frac{1}{2} =$
  $\frac{2+4}{8} = \frac{6}{8}$
  $\frac{6}{8} \div 2 = \frac{6}{8} \times \frac{1}{2} = \frac{3}{8}$
- $B = (C - A) \div 2$
  $= (\frac{1}{2} - \frac{1}{4}) \div 2$
  $= \frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$
  $B = \frac{1}{4} + \frac{1}{8} = \frac{3}{8}$

Partially Correct Response: 2 marks

- $\frac{2}{8} + \frac{4}{8} = \frac{6}{8}$
- $\frac{1}{4} + \frac{1}{2} = \frac{3}{4}$
  Dividing by 2 incorrectly
- $\frac{\text{C–A incorrectly}}{2} + \frac{1}{4}$
- Converting 1 fraction to an equivalent form and dividing by 2.

Partially Correct Response: 1 mark

- $\frac{1}{4} + \frac{1}{2}$ = inaccurate calculation

$\frac{\text{Incorrect addition}}{2}$

- C – A correctly
- Changing any 1 fraction to the correct equivalent form.
- Showing an attempt to find the mid-point.

Incorrect Response: 0 mark

- $\frac{1}{3}$

22. Objective: Solve one-step word problems involving any one of the four basic operations on whole numbers.

- **Alternative Solutions Indicated**

Correct Response: 2 mark

- Mike: 149 – 45 = 104
  Altogether = 149 + 104 = 253
- 104 + 104 + 45 = 253
- 149 + 149 = 298
  298 – 45 = 253

Partially Correct Response: 1 mark

- 149 – 45 = 104
  104 + 104
- Correct choice of operations but errors in calculation

Incorrect Response:

- 149 + 45 = 194

23. Objective: Solve one-step word problems involving any one of the four basic operations on whole numbers.

• **Alternative Solutions Indicated**

Correct Response: 3 marks

- No. of chairs = 22 x 18 = 396 chairs
  Extra chairs = 468 – 396 = 72
  No. of rows = $\frac{72}{18} = 4$
- 468 ÷ 18 = 26
  26 – 22 = 4

Partially Correct Response: 2 marks

- No. of chairs = 22 x 18 = 396 chairs
  Extra chairs = 468 – 396 = 72
- 468 ÷ 18 = 26

Partially Correct Response: 1 mark

- No. of chairs = 22 x 18 = 396 chairs
- 468 ÷ 18
- Correct choice of operations but errors in calculation

Incorrect Responses:

- 468 ÷ 22
- 468 + 22 + 18

24. Objective: Calculate total cost and the change in money transactions.

• **Alternative Solutions Indicated**

Correct Response: 2 marks

- 1 copy book = $\frac{7.20}{9} = \$0.80$
  24 copybooks = 24 x $0.80 = $19.20
- 7.20 ÷ 3 = $2.40
  2.40 x 8 = $19.20
- $\frac{7.20}{9}$ x 24 = $19.20

Partially Correct Response: 1 mark

- 1 copy book = $\frac{7.20}{9} = \$0.80$
- 7.20 ÷ 3 = $2.40

Incorrect Responses:

- 7.20 x 24
- 7.20 x 9
- $\frac{7.20}{9}$ with wrong answer

25. Objective: Solve multi-step words problems involving any combination of the four basic operations on whole numbers.

• **Alternative Solutions Indicated**

Correct Response: 3 marks

- No. of children remaining after girls left = 399 – 39 = 360
  No. of girls remaining = 360 ÷ 3 = 120
  No. of girls at first = 120 + 39 = 159

Partially Correct Response: 2 marks

- No. of children remaining after girls left = 399 – 39 = 360
  No. of girls remaining = 360 ÷ 3 = 120
- Correct choice of operations with inaccurate answer

Partially Correct Response: 1 mark

- No. of children remaining after girls left = 399 – 39 = 360

Incorrect Responses:

- 399 + 39
- 399 x 2
- 399 ÷ 2
- 399 – (39 x 2)

26. Objective: Use estimation strategies in problem solving contexts with whole numbers.

• Alternative Solutions Indicated

Correct Response: 2 marks

- 15 and 16, 14 and 17, 13 and 18

Partially Correct Response: 1 mark

- Both quantities at least 13, adding up to 31.
  $45 - 14 = 31$
- Knowing that quantities must add up to 31 / understanding 'at least 13' but incorrect calculations.

Incorrect Responses:

- $45 \div 3$
- 45×3

27. Objective: Solve real-life, one-step problems involving whole numbers, (including profit and loss, best buy, discount, savings, salaries, wages, loans, simple interest, VAT).

• Alternative Solutions Indicated

Correct Response: 2 marks

- $\frac{20}{100} \times \frac{140}{1} = 28$ or $\frac{1}{5} \times \frac{140}{1} = 28$
  Discount price $= 140 - 28 = \$112.00$
- $\frac{80}{100} \times \frac{140}{1} = \$112.00$

Partially Correct Response: 1 mark

- $\frac{20}{100} \times \frac{140}{1} = 28$ or $\frac{1}{5} \times \frac{140}{1} = 28$
- $\frac{20}{100} \times \frac{140}{1}$ = wrong answer and then subtract from 140
- Correct choice of operations but calculations inaccurate.

28. Objective: Solve real-life, multi-step problems involving whole numbers, (including profit and loss, best buy, discount, savings, salaries, wages, loans, simple interest, VAT).

• Alternative Solutions Indicated

Correct Response: 3 marks

- $240 \div 20 = 12$
  $12 - 3 = 9$
- $20 \times 3 = 60$
  $240 - 60 = 180$
  $180 \div 20 = 9$
- $240 \div 60 = 4$
  $4 \times 3 = 12$
  $12 - 3 = 9$

Partially Correct Response: 1 mark

- 20×3
- $240 \div 20$
- $240 \div 60$

Partially Correct Response: 2 marks

- $20 \times 3 = 60$
  $240 - 60 = 180$
- $240 \div 20 = 12$
- $240 \div 20$ = inaccurate answer but subtract correctly
- Subtract 60 incorrectly and then divide by 20
- $60 \longrightarrow 3$
  $240 \longrightarrow 12$

29. Objective: Explain or demonstrate how an answer was obtained when solving problems.

• **Alternative Solutions Indicated**

Correct Response: 3 marks

- Edward. Dividing by 15 will give more groups than dividing by 18.
- Edward. Dividing by 15 will give a larger answer than dividing by 18.
- Edward. The bigger the number you divide by, the smaller is the answer.
- Edward: Dividing by a smaller number gives a greater answer.
- Edward: A smaller number goes into another number more times.

Partially Correct Response: 2 marks

- Edward and partially correct reasoning.
- No name but correct reasoning

Partially Correct Response: 1 mark

- Edward

Incorrect Response:

- Gabriel

30. Objective: Solve real-life, one-step problems involving whole numbers, (including profit and loss, best buy, discount, savings, salaries, wages, loans, simple interest, VAT).

• **Alternative Solutions Indicated**

Correct Response: 3 marks

- S.I. = $\frac{\$3000 \times 12 \times 2}{100}$ = \$720
  Total = \$3 000 + \$720 = \$3720
  Monthly = $\frac{\$3720}{24}$ = \$155

Partially Correct Response: 1 mark

- S.I. = $\frac{\$3000 \times 12 \times 2}{100}$ = \$720

Partially Correct Response: 2 marks

- S.I. = $\frac{\$3000 \times 12 \times 2}{100}$ = \$720
  Total = \$3 000 + \$720 = \$3720
- S.I. = $\frac{\$3000 \times 12 \times 2}{100}$ = \$720
  $\frac{\$720}{24} = 3$
- Correct use of formulae and operations but calculations inaccurate.

Incorrect Responses:

- \$3000 x 12 x 2
- $\frac{\$3000}{24}$

31. Objective: Calculate area of shapes drawn on a grid with unit squares.

• Alternative Solutions Indicated

Correct Response: 2 marks

- 11 x 4 = 44 cm^2

Partially Correct Response: 1 mark

- 11
- 11 x 2 = 22 cm^2
- 22 only
- Either 10 or 13 multiplied by 4
- 13 x 2
- $\frac{11}{28}$

Incorrect Responses:

- 28 cm^2
- 56 cm^2

32. Objective: Solve computational and real-life problems involving hours and minutes.

• Alternative Solutions Indicated

Correct Response: 2 marks

- 12:45 – 9:00 = 3:45
  3:45 rounded to 4
  4 x 5 = $20.00

Partially Correct Response: 1 mark

- 12:45 – 9:00 = 3:45
- 4 hours
- 3 x 5 = $15.00
- 3:45 x 5

33. Objective: Find the perimeters of simple composite figures that may be dissected into rectangles and squares.

• Alternative Solutions Indicated

Correct Response: 3 marks

- Calculating unknowns: 4 cm and 7 cm
  Addition of sides: 4 cm + 7 cm + 6 cm + 2 cm + 10 cm + 9 cm = 38 cm

Partially Correct Response: 2 marks

- Calculating the 2 unknowns correctly and adding incorrectly
- Calculating 1 unknown correctly and adding all the sides correctly
- 42 but forgot to subtract 4

Partially Correct Response: 1 mark

- Calculating 1 unknown

Incorrect Response:

- 27 cm

34. Objective: Solve problems involving length.

• Alternative Solutions Indicated

Correct Response: 3 marks

- 1 large + 1 small = 48 cm

Length of ribbon used = 800 – 32 = 768 cm

No. of large and small = 768 ÷ 48 = 16

Total no. of bows = 16 x 2 = 32

Partially Correct Response: 2 marks

- Correct choice of operations with wrong calculations
- 1 large + 1 small = 48 cm

Length of ribbon used = 800 – 32 = 768 cm

No. of large and small = 768 ÷ 48 = 16

Partially Correct Response: 1 mark

- 48 cm
- 768 cm

Incorrect Responses:

- 800 ÷ 48
- 8 + 36 + 12+ 32
- 800 cm

35. Objective: Determine the pattern rule and extend the pattern using concrete materials or pictorial representation.

• Alternative Solutions Indicated

Correct Response: 2 marks

- Any six-sided polygon.

Partially Correct Response: 1 mark

- Six sides not enclosed.

Incorrect Response:

- Triangle

36. Objective: Describe the properties of specific quadrilaterals (rectangle, square, trapezium, parallelogram and rhombus).

• Alternative Solutions Indicated

Correct Response: 3 marks

Only 1 pair of parallel sides- **trapezoid**

4 equal angles- **rectangle**

4 equal sides- **rhombus**

Partially Correct Response: 2 marks

- Any 2 shapes correct

Partially Correct Response: 1 mark

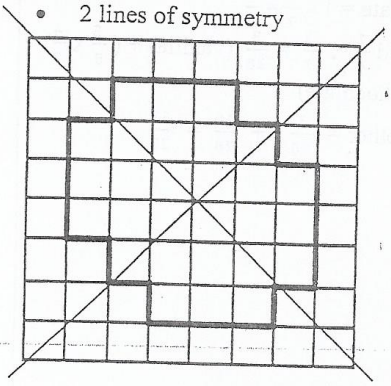
- 1 shape correct

37. Objective: Determine the number of lines of symmetry in plane shapes – (regular, irregular and curved) and in numerals and letters.

• Alternative Solutions Indicated

Correct Response: 2 marks

- 2 lines of symmetry



Partially Correct Response: 1 mark

- 1 line of symmetry

Incorrect Response:

- No lines of symmetry drawn

38. Objective: Apply findings from analysis of data to solve problems.

• Alternative Solutions Indicated

Correct Response: 2 marks

- 15 + 7 + 2 = 24

Partially Correct Response: 1 mark

- 15 + 7 + 2 with wrong calculation

Incorrect Response:

- 15

39. Objective: Represent data using tally charts, frequency tables and graphs (pictographs, block graphs, bar graphs) using various scale factor.

• Alternative Solutions Indicated

Correct Response: 2 marks

- 10 - Two and a half T-shirts

Partially Correct Response: 1 mark

- 10

Incorrect Response:

- 5 t-shirts

40. Objective: Communicate findings and decisions made using appropriate vocabulary associated with statistics. • Alternative Solutions Indicated

Correct Response: 3 marks

- Any sport with a reasonable justification of choice using all of the other data presented (Need to speak about their chosen sport as well as the others presented).

Partially Correct Response: 2 marks

- Any sport with a reasonable justification with use of some of the data presented.

Partially Correct Response: 1 mark

- Any sport with an incomplete justification.

Incorrect Response:

- Any sport chosen without any explanation.

41. Objective: Solve multi-step problems involving fractions.

• Alternative Solutions Indicated

Correct Response: 4 marks

- Chocolate = $1 - \frac{3}{7} = \frac{4}{7}$

  She sold $\frac{1}{4} \times \frac{3}{7} = \frac{3}{28}$ (vanilla) $+ (\frac{5}{8} \times \frac{4}{7}) = \frac{10}{28}$ (chocolate)

  Altogether = $\frac{3}{28} + \frac{10}{28} = \frac{13}{28}$

  She had $1 - \frac{13}{28} = \frac{15}{28}$

  To find whole, = $\frac{28}{15} \times 150 = 280$

- Cupcakes remaining = $\frac{3}{4} \times \frac{3}{7} = \frac{9}{28}$ vanilla

  $\frac{3}{8} \times \frac{4}{7} = \frac{12}{56}$ chocolate

  Total remaining = $\frac{9}{28} + \frac{12}{56} = \frac{30}{56}$

  To find whole, = $\frac{56}{30} \times 150 = 280$

Partially Correct Response: 3 marks

- Chocolate = $1 - \frac{3}{7} = \frac{4}{7}$

  She sold $\frac{1}{4} \times \frac{3}{7} = \frac{3}{28}$ (vanilla) $+ (\frac{5}{8} \times \frac{4}{7})$ $= \frac{10}{28}$ (chocolate)

  Altogether = $\frac{3}{28} + \frac{10}{28} = \frac{13}{28}$

  She had $1 - \frac{13}{28} = \frac{15}{28}$

Partially Correct Response: 2 marks

- Chocolate = $1 - \frac{3}{7} = \frac{4}{7}$

  She sold $\frac{1}{4} \times \frac{3}{7} = \frac{3}{28}$ (vanilla) $+ (\frac{5}{8} \times \frac{4}{7})$ $= \frac{10}{28}$ (chocolate)

  Altogether = $\frac{3}{28} + \frac{10}{28} = \frac{13}{28}$

Partially Correct Response: 1 mark

- Calculating correct fraction for either vanilla or chocolate sold

42. Objective: Solve multi-step words problems involving any combination of the four basic operations on whole numbers.

• Alternative Solutions Indicated

Correct Response: 4 marks

- 30 mangoes were given free, therefore 30 persons bought 2 mangoes
  Cost of 60 mangoes = 60 x 6 = $360
  Money spent by single customers = $504 – $360 = $144
  No. of customers who bought single = $\frac{144}{6}$ = 24
- 30 mangoes were given free, therefore 30 persons bought 2 mangoes
  Total S.P. = $504
  No. of customers = $\frac{\$504}{6}$ = 84
  = 84 – 60 = 24

Partially Correct Response: 3 marks

- 30 mangoes were given free, therefore 30 persons bought 2 mangoes
  Cost of 60 mangoes = 60 x 6 = $360
  Money spent by single customers = 504 – 360 = $144
- No. of customers = $\frac{\$504}{6}$ = 84
  = 84 – 30
  = 54

Partially Correct Response: 2 marks

- 30 mangoes were given free, therefore 30 persons bought 2 mangoes
- Cost of 60 mangoes = 60 x 6 = $360
- $\frac{\$504}{6}$ = 84

Partially Correct Response: 1 mark

- 30 mangoes were given free, therefore 60 persons bought 2 mangoes
- $\frac{\$504}{6}$ = Incorrect answer

43. Objective: Solve problems involving volume/capacity.

• Alternative Solutions Indicated

Correct Response: 4 marks

- L x B x H = 12 x 6 x 10 = 720 cm^3
  Vol of 1 small cube = 8 cm^3
  No. of cubes = $\frac{720}{8}$ = 90
  More cubes needed = 90 – 8 = 82

- 5 x 6 x 3 = 90 cubes
  90 – 8 = 82 cubes

- No. of cubes = $\frac{12 \times 10 \times 6}{2 \times 2 \times 2}$ = 90

  More cubes needed = 90 – 8 = 82

Partially Correct Response: 3marks

- L x B x H = 12 x 6 x 10 = 720 cm^3
  Vol of 1 small cube = 8 cm^3
  No. of cubes = $\frac{720}{8}$ = 90 cubes

- L x B x H = 12 x 6 x 10 = 720 cm^3
  Vol of 1 small cube = 8 cm^3
  No. of cubes = $\frac{720}{8}$ = 90 cubes
  More cubes needed = 90 – 7 = 83 cubes

Partially Correct Response: 2 marks

- L x B x H = 720
  No. of smaller cubes = 8

Partially Correct Response: 1 mark

- L x B x H = 720 cm^3

44. Objective: (a) Solve problems involving solids.

(b) Create symmetrical shapes.

- **Alternative Solutions Indicated**

a. Correct Response: 3 marks

- A quadrilateral drawn with a pair of parallel lines and one angle smaller than a right angle.

Partially Correct Response: 2 marks

- A quadrilateral drawn with 1 pair of parallel lines.
- A quadrilateral drawn with only 1 angle less than a right angle.

Partially Correct Response: 1 mark

- Any quadrilateral drawn only.

b. Correct Response: 1 mark

- Must show an extension of the quadrilateral which makes it symmetrical.

45. Objective: Use analyzed data to solve problems, draw conclusions and make decisions.

- **Alternative Solutions Indicated**

a. Correct Response: 2 marks

- Reading off graph at 8cm and adding the original height = 12 + 8 = 20 cm

Partially Correct Response: 1mark

- Reading off graph at 8cm

b. Correct Response: 2 marks

- Drawing the bar to 12 cm

Partially Correct Response: 1mark

- Evidence of pattern with an increase in 2 cm