**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

NOVEMBER 2020

**MATHEMATICAL LITERACY P2
(EXEMPLAR)**

MARKS: 100

TIME: 2 hours

IMLIT2

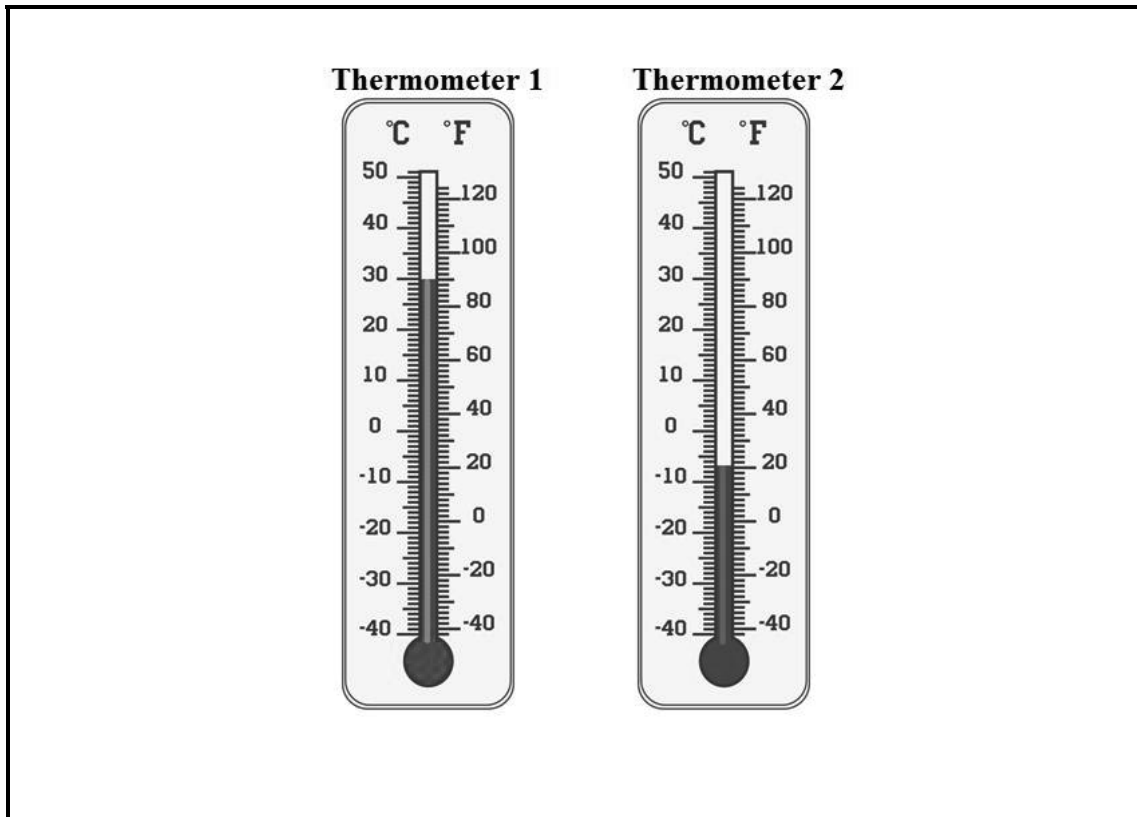This question paper consists of 8 pages and an addendum with 4 pages.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1.   This question paper consists of FOUR questions. Answer ALL the questions.

2.   Use the ADDENDUM with ANNEXURES for the following questions:
   ANNEXURE A for QUESTION 2.2,
   ANNEXURE B for QUESTION 3.1,
   ANNEXURE C for QUESTION 3.2 and
   ANNEXURE D for QUESTION 4.1

3.   Number the questions correctly according to the numbering system used in this question paper.

4.   An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.

5.   Show ALL calculations clearly.

6.   Maps and diagrams are NOT drawn to scale, unless otherwise stated.

7.   Indicate units of measurement, where applicable.

8.   Round off ALL final answers appropriately accordingly to the given context, unless stated otherwise.

9.   Start EACH question on a NEW page.

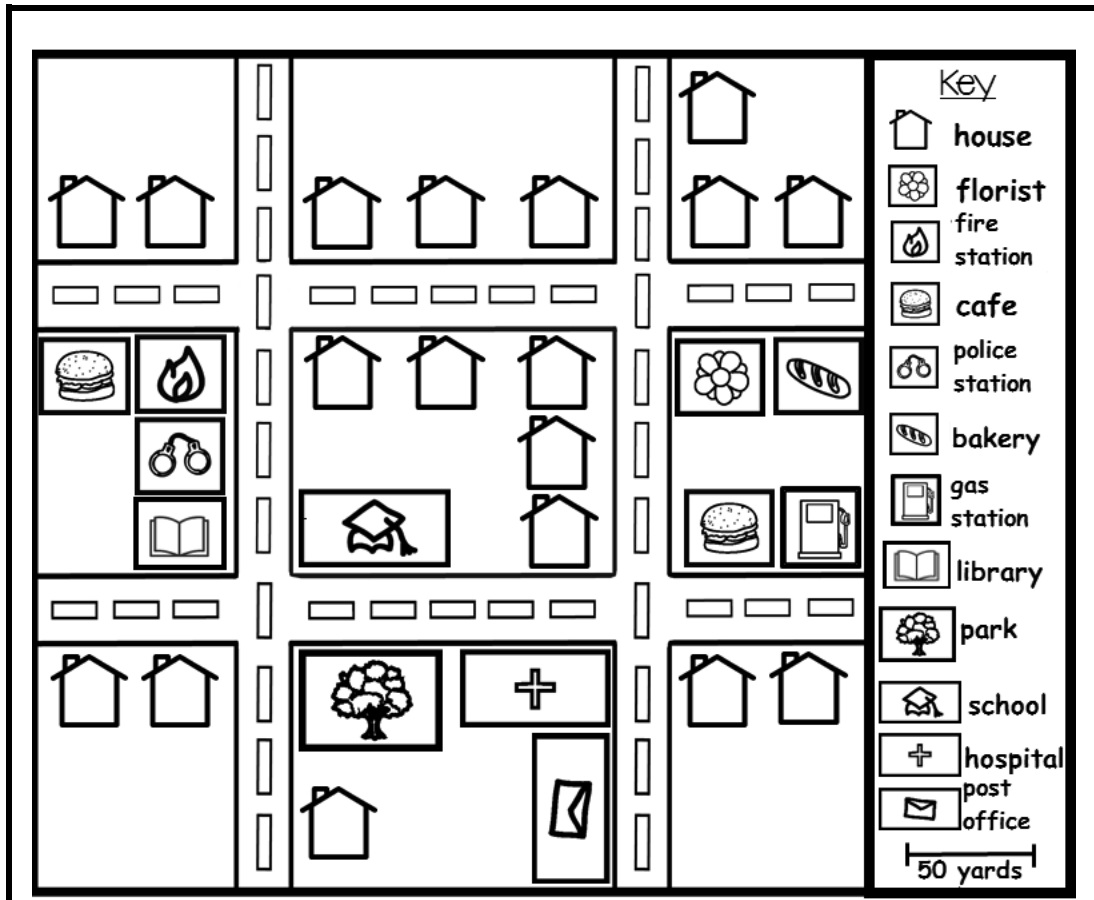10.   Write neatly and legibly.

QUESTION 1

1.1   Study the following thermometers and answer the questions that follow.

1.1.1   Write down the temperature reading in degrees Celsius (°C) of thermometer 1.   (2)

1.1.2   Identify the temperature in degrees Fahrenheit (°F), if the temperature in degrees Celsius (°C) is 35.   (2)

1.1.3   Use thermometer 2 and write down the minimum temperature in degrees Fahrenheit (°F) as illustrated on the thermometer.   (2)

1.1.4   Write the temperature reading in degrees Fahrenheit (°F) of thermometer 1 to thermometer 2 as a ratio in its simplest form.   (3)

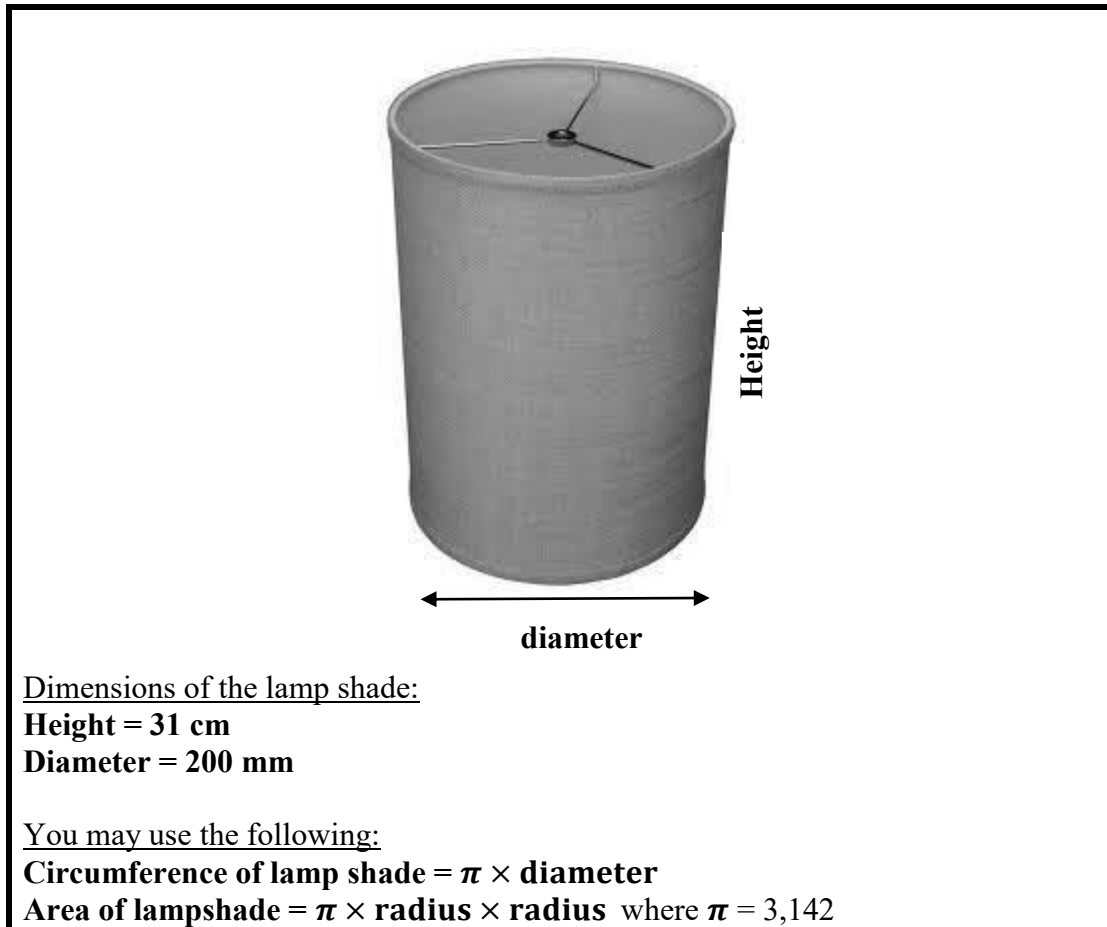1.2   The following is a street map of a neighbourhood. Study the street map and answer the questions.

1.2.1   How many houses are there in this neighbourhood?   (2)

1.2.2   Which building is located next to the park?   (2)

1.2.3   Which business appears more than all the other businesses?   (2)

1.2.4   The bar (graphic or line) scale shows the distance of the bar in real life. Measure the length of the bar in centimetres.   (2)

1.2.5   Hence, use your measurement in QUESTION 1.2.4 to explain the scale of this street map.   (2)

1.2.6   How many more houses are in the street at the top than the street at the bottom?   (2)

                                                                                                        [21]

QUESTION 2

2.1 The following diagram shows a cylindrical lamp shade. Use the information to answer the questions that follow.

Dimensions of the lamp shade:
Height = 31 cm
Diameter = 200 mm

You may use the following:
Circumference of lamp shade = π × diameter
Area of lampshade = π × radius × radius where π = 3,142

2.1.1 Explain the term *circumference* in this context. (2)

2.1.2 Determine the radius of the lamp shade in centimetres. (3)

2.1.3 Hence, calculate the circumference of the lamp shade in centimetres. (2)

2.1.4 A worker stated that the height of the lamp shade is 65% more than the diameter of the lamp shade.

Verify, with the necessary calculations, whether the statement is valid or not. (3)

2.1.5 The lamp shade needs to be covered with material.
Calculate the area for the material required if 4,25% wastage must be allowed for seams and overlaps. Give your final answer to the nearest square centimetre. (5)

2.2 | ANNEXURE A shows the instructions of how a floor lamp is assembled. Use ANNEXURE A to answer the questions below.

2.2.1   How many parts are used to assemble the floor shade excluding the tools (Allen keys and wrench)? (2)

2.2.2   Determine the probability of randomly using a set screw to assemble the floor lamp. Write your final answer to 3 decimal places. (3)

2.2.3   Give a reason why the manufacturer included an 'IMPORTANT' instruction to the assemblement. (2)

2.2.4   Explain why the manufacturer did not include a bulb in the packaging. (2)

2.2.5   Explain the purpose of the connector. (2)

[26]

QUESTION 3

3.1   Study the map, ANNEXURE B, that shows an extract of Durban. Answer the following questions that refer to the map, ANNEXURE B.

      3.1.1   Give the TWO general directions that will be travelled from the Durban City Centre via Berea to Sydenham.   (4)

      3.1.2   Explain the term *scale*.   (2)

      3.1.3   Use the linear (graphic) scale on the map and rewrite it as a numeric scale as 1 : … to the nearest thousand.   (4)

      3.1.4   The distance from The Bluff to Riverside is 18,2 km when using the M4. At what time will you arrive in Riverside if you leave the Bluff at 14:53 at a speed of 65 km/h?

            You may use the following:
$$\text{Speed} = \frac{Distance}{Time}$$ (6)

      3.1.5   The city of Durban did NOT expand to the east. What is the reason for this?   (2)

3.2 | Refer to the recipe, ANNEXURE C, and answer the questions below.

You may use the following:

1 pound (lb) = 0,454 kilogram
1 tablespoon = 15 millilitres
1 teaspoon = 5 millilitres
1 cup = 250 millilitres
1 litre = 1 000 millilitres |
|---|

      3.2.1   How many kilograms of steak is used for the Beef Stroganoff?   (2)

      3.2.2   Determine the total millilitres of salt and black pepper to be used for the recipe.   (3)

      3.2.3   A new chef stated that the total amount of ingredients for the broth, whipping cream and sour cream is exactly half a litre. Verify, with the necessary calculations, whether his statement is valid or not.   (5)

      3.2.4   Determine the maximum cooking time for the Beef Stroganoff.   (3)

      3.2.5   Explain why the time for cooking is NOT the only time that should be considered for making the Beef Stroganoff.   (2)

[33]

QUESTION 4

4.1   ANNEXURE D shows a seating plan of a cinema. Study the seating plan and answer the questions.
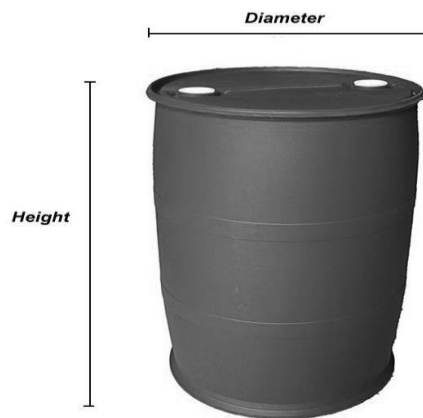
         4.1.1   Write down the number of seats in Row N.   (2)

         4.1.2   How many more seats are there in the 'Raised Seating Area' than in the 'Flat Seating Area'?   (4)

         4.1.3   Determine the probability that someone will be seated in the 'L' row.   (2)

         4.1.4   You are seated at Seat A17, while your cousin is seated at G7. You need to give your cousin something. Explain how you will walk to reach your cousin if you walk pass the stage/screen area.   (3)

4.2   The following diagram shows a drum that is advertised as 200 litres. Answer the questions below.

         Dimensions of the drum:
         Diameter = 580 mm
         Height = 93 cm

         You may use the following:
         Volume of drum = π × radius × radius × height, where π = 3,142
         1 000 cm³ = 1 litre

         4.2.1   Show, with the necessary calculations, that the volume of the drum in litres is different than the advertised 200 litres.   (5)

         4.2.2   Hence, explain why the two volumes in litres are different.   (4)

                                                                 [20]

                                                     TOTAL: **100**

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MATHEMATICAL LITERACY P2
ADDENDUM
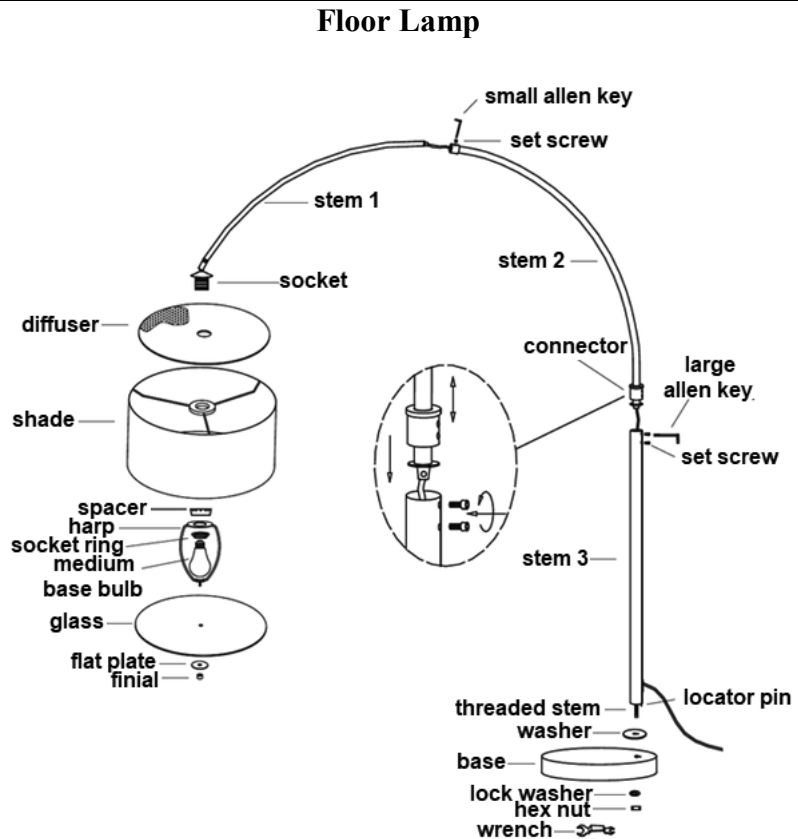## (EXEMPLAR)

IMLIT4

ANNEXURE A

QUESTION 2.2

ASSEMBLE A – FLOOR LAMP

IMPORTANT: Always disconnect the power before installing or replacing a bulb and before cleaning or other maintenance.

Assembly and installation instructions	Floor Lamp
1. Attach the base to stem 3, inserting the threaded stem and locator pin through the washer and in the base. Secure the lock washer and hex nut using the wrench (included). 2. Insert the connector on stem 2 into stem 3 and use the large Allen key to tighten the set screws. (Loosen the set screws to adjust the height of the lamp) 3. Insert stem 1 into stem 2 and use the small Allen key to tighten the set screw. 4. Attach the diffuser, shade, spacer, and harp to the socket, and secure with socket ring. 5. Install a 100-Watt medium base bulb (not included). 6. Attach the glass and flat plate to the harp and secure with the finial. 7. Plug in the cord and the dimmer switch is located on the cord.	

[Source: https://manualzz.com/doc/19886634/assembly-instructions-for-item]

ANNEXURE B

QUESTION 3.1

ANNEXURE C

QUESTION 3.2

RECIPE FOR BEEF STROGANOFF
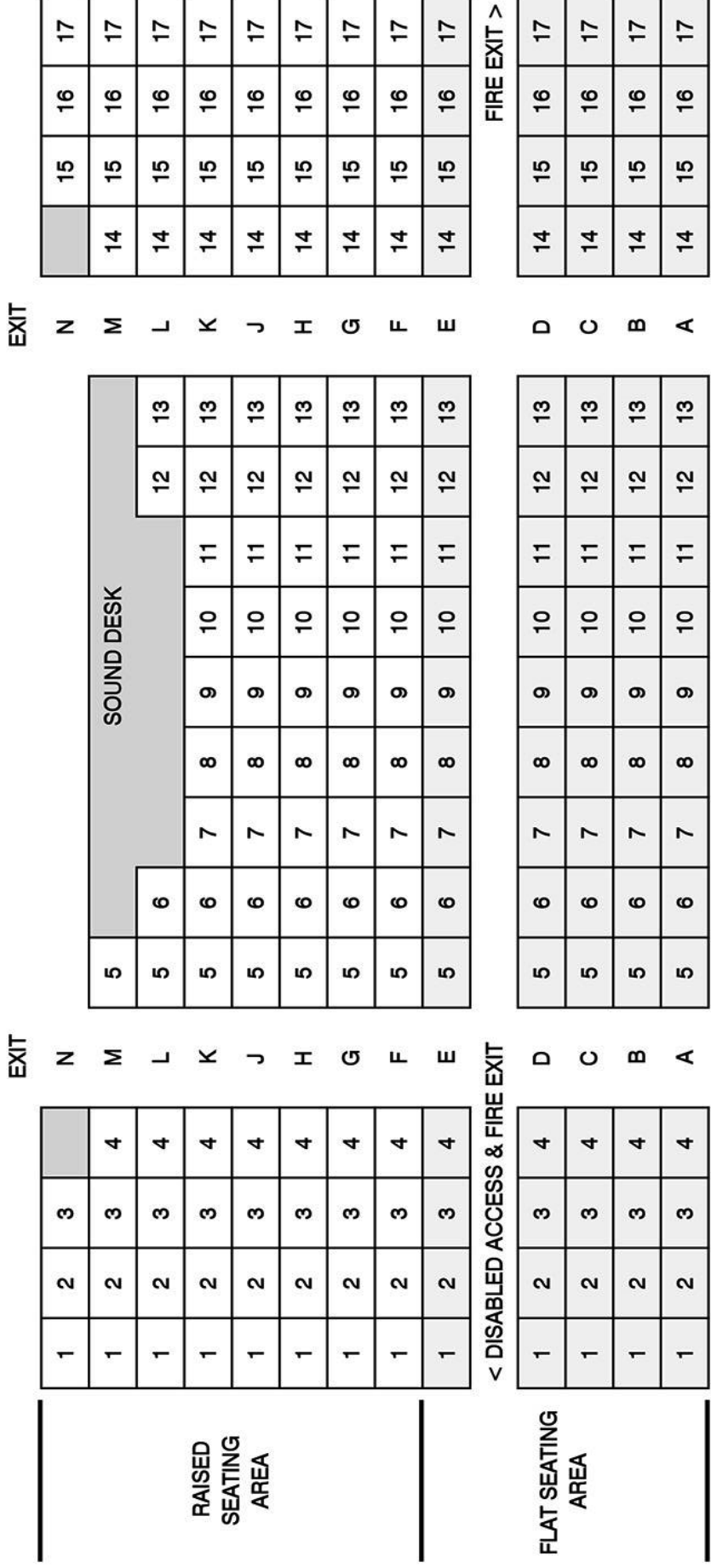
For the Beef Stroganoff:

- 1 lb (pound) top sirloin steak thinly sliced into strips
- 2 (tbsps.) tablespoon olive oil
- 2 (tbsps.) tablespoon butter
- $\frac{1}{2}$ medium onion, finely chopped
- $\frac{1}{2}$ lb (pound) brown mushrooms, thickly sliced
- 1 garlic clove minced
- 1 (tbsp.) tablespoon all-purpose flour
- 1 cup beef broth
- $\frac{3}{4}$ cup heavy whipping cream
- $\frac{1}{4}$ cup sour cream
- 1 (tbsp.) tablespoon Worcestershire sauce
- $\frac{1}{2}$ (tsp.) teaspoon Dijon mustard
- $\frac{1}{2}$ (tsp.) teaspoon salt
- $\frac{1}{4}$ (tsp.) teaspoon black pepper

Instructions

1. Place a large deep pan over medium-high heat. Add 2 tbsps. oil and once the oil is very hot, add thinly sliced beef strips in a single layer, cooking 3 minutes per side without stirring. Cook until just browned and no longer red. Remove beef to a plate and cover to keep warm.

2. Add 2 tbsps. butter, chopped onion and sliced mushrooms. Sauté 6 to 8 minutes or until liquid has evaporated and onions and mushrooms are soft and lightly browned.

3. Add 1 minced garlic clove and sauté 1 minute until fragrant. Add 1 tbsp. flour and sauté another minute stirring constantly.

4. Pour in 1 cup of beef broth, scraping any bits from the bottom of the pan. Then add $\frac{3}{4}$ cup of whipping cream and simmer another 1 to 2 minutes or until slightly thickened.

5. Stir a few tablespoons of the sauce into $\frac{1}{4}$ cup of sour cream to temper it so the sour cream does not curdle. Then add it to the pan while stirring constantly.

6. Stir in 1 tbsp. Worcestershire, $\frac{1}{2}$ tsp Dijon mustard, and season with $\frac{1}{2}$ tsp salt and $\frac{1}{4}$ tsp pepper, or season to taste and continue simmering for 20 minutes until sauce is creamy. Add beef with any accumulated juices back to the pan and bring just to a simmer for 2 minutes until beef is heated through.

ANNEXURE D

QUESTION 4.1

EXIT

RAISED SEATING AREA

Row	1	2	3	4		5	6	7	8	9	10	11	12	13		14	15	16	17
N		2	3			5	SOUND DESK							12	13			15	16	17
M	1	2	3	4		5	6	7	8	9	10	11	12	13		14	15	16	17
L	1	2	3	4		5	6	7	8	9	10	11	12	13		14	15	16	17
K	1	2	3	4		5	6	7	8	9	10	11	12	13		14	15	16	17
J	1	2	3	4		5	6	7	8	9	10	11	12	13		14	15	16	17
H	1	2	3	4		5	6	7	8	9	10	11	12	13		14	15	16	17
G	1	2	3	4		5	6	7	8	9	10	11	12	13		14	15	16	17
F	1	2	3	4		5	6	7	8	9	10	11	12	13		14	15	16	17
E	1	2	3	4		5	6	7	8	9	10	11	12	13		14	15	16	17

< DISABLED ACCESS & FIRE EXIT

FLAT SEATING AREA

Row	1	2	3	4		5	6	7	8	9	10	11	12	13		14	15	16	17
D	1	2	3	4		5	6	7	8	9	10	11	12	13		14	15	16	17
C	1	2	3	4		5	6	7	8	9	10	11	12	13		14	15	16	17
B	1	2	3	4		5	6	7	8	9	10	11	12	13		14	15	16	17
A	1	2	3	4		5	6	7	8	9	10	11	12	13		14	15	16	17

FIRE EXIT >

STAGE / SCREEN

MARKS: 100

Symbol	Explanation
M	Method
M/A	Method with Accuracy
MCA	Method with Consistent Accuracy
CA	Consistent Accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG/RM	Reading from a table OR Reading from a graph OR Read from map
F	Choosing the correct formula
SF	Substitution in a formula
J	Justification
P	Penalty, e.g. for no units, incorrect rounding off etc.
R	Rounding Off OR Reason
AO	Answer only
NPR	No penalty for rounding

This marking guideline consists of 5 pages**.**

QUESTION 1 [21 MARKS]			
Ques.	**Solution**	**Explanation**	**Topic & Level**
1.1.1	Temperature reading = 30 °C ✓✓A	2A Correct reading (2)	M L1
1.1.2	°F = 100 °F ✓✓A	2A °F (2)	M L1
1.1.3	Minimum °Fahrenheit = minus 42°F **OR** -42°F ✓✓A	2A Min °F (2)	M L1
1.1.4	Thermometer 1 : Thermometer 2 ✓RD = 90 : 20 ✓M = 9 : 2 ✓CA	1RD Both values correct 1M Correct order 1CA Simplified ratio (3)	M L1
1.2.1	Number of houses = 18 ✓✓A	2A Correct number of houses (2)	M L1
1.2.2	Hospital✓✓A	2A Correct building (2)	M L1
1.2.3	Café ✓✓A	2A Correct business (2)	M L1
1.2.4	Length of the bar = 1,5 cm ✓✓A	2A Correct length (2)	M L1
1.2.5	1,5 cm on the map represents 50 yards in reality✓✓A	**CA from 1.2.4** 2A Explanation (2)	M L1
1.2.6	3 houses ✓✓A	2A Number of houses more (2)	M L1
		[21]	

QUESTION 2 [26 MARKS]			
Ques.	**Solution**	**Explanation**	**Topic & Level**
2.1.1	Circumference is the distance or length around the lamp shade ✓✓A	2A Explanation (2)	M L1
2.1.2	Radius $= \frac{200}{10}$ ✓C $\qquad = \frac{20}{2}$ ✓M $\qquad = 10$ cm ✓CA	1C mm to cm 1M Divide by 2 1CA Radius (3)	M L2
2.1.3	Circumference of lamp shade $= \pi \times$ diameter $\qquad\qquad\qquad = 3,142 \times 20$ cm ✓SF $\qquad\qquad\qquad = 62,84$ cm ✓MCA	**CA from 2.1.1** 1SF Substitution 1MCA Circumference (2)	M L2
2.1.4	Height of lamp shade $= 20$ cm $\times 1,65$ ✓M $\qquad\qquad\qquad = 33$ cm ✓A Statement invalid ✓O	1M Multiply by 1,65 1A Height 1O Invalid (3)	M L4
2.1.5	Area of lampshade $= \pi \times$ radius $\times$ radius $\qquad\qquad\qquad = 3,142 \times 10$ cm $\times 10$ cm ✓SF $\qquad\qquad\qquad = 314,2$ cm^2 ✓MCA Area including wastage $= 314,2$ cm$^2 \times 1,0425$ ✓M $\qquad\qquad\qquad = 327,5535$ cm^2 ✓CA $\qquad\qquad\qquad \approx 328$ cm^2 ✓R	**CA from 2.1.1** 1SF Substitution 1MCA Area of lamp shade 1M Multiply by 1,0425 1CA Area including wastage 1R Nearest cm^2 (5)	M L3
2.2.1	Number of parts $= 22$ parts ✓✓A	2A Number of parts (2)	M&P L2
2.2.2	P$_{(set\ screw)} = \frac{2}{22}$ ✓A ✓MCA $\qquad = 0,090909....$ $\qquad \approx 0,091$ ✓R	**CA from 2.2.1** 1A Number of set screws 1MCA 1R 3 dec places (3)	P L2
2.2.3	To prevent shocking ✓✓R **OR** For safety purposes **Accept any other relevant reasons**	2R Reason (2)	M&P L4
2.2.4	Bulbs can break/damage ✓✓R	2R Explanation (2)	M&P L4
2.2.5	To connect Stem 2 with Stem 3 ✓✓A	2A Explanation (2)	M&P L4

       Please turn over

QUESTION 3 [33 MARKS]		
Ques.	**Solution**	**Explanation**
3.1.1	Southwest ✓✓A North ✓✓A	2A Southwest 1A North (4)
3.1.2	Scale refers to the relationship (ratio) between distance on a map and the corresponding distance on the ground (reality) ✓✓A	2A Definition (2)
3.1.3	Measure bar = 1,8 cm ✓A **(Accept 1,7 cm to 1,9 cm)** 1,8 cm = 2 km 1,8 cm = 200 000 cm ✓C ∴ 1 cm = 111 111, 111 ✓S ∴ 1 : 111 000 ✓R	1A Measure bar 1C km to cm 1S Simplification 1R Nearest '000 (4)

3.1.4	Speed = $\dfrac{Distance}{Time}$
	65 km/h = $\dfrac{18,2\ km}{Time}$ ✓M
	Time = $\dfrac{18,2\ km}{65\ km/h}$ ✓M
	    = 0,28….h ✓A
	    = 16,8 min ✓C
	    = 17 minutes
	Time of arrival = 14:53 + 17 minutes ✓M
	      = 15:10 ✓CA
		1SF Substitution
		1M Changing subject of formule
		1A Time in hours
		1CA Time in min
		1M Add times
		1CA Arrival time
		      (6)

3.1.5	Because of the (Indian) ocean ✓✓R	2R Reason (2)
3.2.1	Steak = 0,454 kg ✓✓A	2A Kilogram (2)

3.2.2	Salt = 0,5 × 5 ml
	    = 2,5 ml ✓MA
	Black pepper = 0,25 × 5 ml
	        = 1,25 ml ✓CA
	Total = 2,5 ml + 1,25 ml
	    = 3,75 ml ✓CA
		1MA Millilitres
		
		1CA Millilitres
		
		11CA Total (3)

3.2.3	1 cup broth = 250 ml ✓MA
	$\frac{3}{4}$ cup whipping cream = 0,75 × 250 ml
	        = 187,5 ml ✓MA
	$\frac{1}{4}$ cup sour cream = 0,25 × 250
	        = 62,5 ml ✓MA
	Total = 250 ml + 187,5 ml + 62,5 ml
	    = 500 ml = 0,5 litres ✓CA
	Statement is valid ✓O
		1MA 250 ml
		
		1MA 187,5 ml
		
		1MA 62,5 ml
		
		1CA Litre
		1O Valid (5)

Topic & Level column:
- 3.1.1: M&P L2
- 3.1.2: M&P L1
- 3.1.3: M&P L3
- 3.1.4: M&P L3
- 3.1.5: M&P L4
- 3.2.1: M L1
- 3.2.2: M L2
- 3.2.3: M L4

3.2.4	Cooking time ✓M = (3 min × 2) + 8 min + 1 min + 1 min + 2 min + 20 min + 2 min ✓MCA = 40 minutes ✓CA	1M Multiply by 2 1MCA Adding all times 1CA Total time (3)	M L2
3.2.5	Time for preparation should also be considered. ✓✓A	2A Reason (2)	M L4

QUESTION 4 [20 MARKS]			
Ques.	**Solution**	**Explanation**	**Topic & Level**
4.1.1	6 seats ✓✓A	2A No of seats (2)	M&P L1
4.1.2	Raised Seating Area = 112 seats ✓A Flat Seating Area = 85 seats ✓A Difference = 112 – 85 ✓M = 27 seats ✓CA	1A Seats in RSA 1A Seats in FSA 1M Subtract 1CA Difference (4)	M&P L3
4.1.3	$P_{(L\text{-row})} = \frac{12}{197}$ ✓A ✓MCA	1A Numerator 1MCA Denominator **(CA from 4.1.2)** (2)	M&P L2
4.1.4	Walk to A5, then turn right ✓A Walk straight pass the Row D ✓A Third Row (G) third seat ✓A **Accept any other relevant responses**	1A Straight 1A Turn right 1A 3rd row, 3rd seat (3)	M&P L4

4.2.1	Volume of drum = π × radius × radius × height
	                ✓C ✓A
	       = 3,142 × 29 cm × 29 cm × 93 cm ✓SF
	       = 245 745, 246 cm³ ✓CA
	Litres = 245 745, 246 cm³ ÷ 1 000 cm³
	       = 2 45,745 litres ✓CA
		1C mm to cm
		1A Radius
		1SF Substitution
		1CA Volume
		1CA Litres (5)
			M
			L3

4.2.2	• The volume of advertisement refers to the maximum the drum can hold. ✓✓A • The calculated volume refers to the entire drum. ✓✓A	2A 1st Reason 2A 2nd Reason (4)	M L4
		TOTAL:	**100**