Department of Education - Western Province

Year End Evaluation - 2020

Grade 11 - Mathematics I - Marking Scheme

Part - A

(01) $2000 \times \frac{7}{100}$ → 1

Rs. 140 → 1 (2)

(02) $2^2x^2 - 5^2$ → 1

$(2x - 5)(2x + 5)$ → 1 (2)

(03) $x + 2x + 75^0 = 180^0$ → 1

$x = 35^0$ → 1

(04) 7.2 → 2 (2)

(05) $\frac{80 \times 3}{2}$ → 1

$120 kmh^{-1}$ → 1 (2)

(06) $x = 60^0$ → 1

$y = 60^0$ → 1 (2)

(07) $V = \frac{1}{3} \times 4 \times 3 \times 10$ → 1

$= 60cm^3$ → 1 (2)

(08) identifying the coordinates of A and B → 1

Gradient $= \frac{3}{6} = \frac{1}{2}$ → 1 (2)

(09) $x \geq 2$ → 1

Smallest value $= 2$ → 1 (2)

(10) $B\hat{C}F = 60^0$ (Corresponding angles) 1

$D\hat{A}F = 150^0$ → 1 (2)

(11) $4x^2y^2$ → 2 (2)

(12) $\frac{12 \times 10}{8}$ → 1

15 men → 1 (2)

(13) $x = 100^0$ → 1

$y = 75^0$ → 1 (2)

(14) 5-10 drawing the rectangle with the height 6 units → 1

10-20 drawing the rectangle with the height 8 units → 1 (2)

(15) 1.6021 → 2 (2)

(16) (i) ✓ → 1

(ii) × → 1 (2)

(17) $\frac{6}{a} = 2$ → 1

$a = 3$ → 1 (2)

(18) $x + 60^0 = 90^0$ (identifying 90^0 or 60^0) → 1

$x = 30^0$ → 1 (2)

(19) DC arc length =11cm → 1

ABCD perimeter = 47cm → 1 (2)

(20) $25 \times \frac{3}{5}$ → 1

$= 15$ → 1 (2)

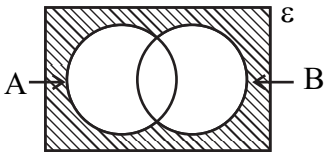
(21) perpendicular → 1

bisects → 1 (2)

(22) $2 - x = 3$ → 1

$x = -1$ → 1 (2)

(23)



2 (2)

(24) $\frac{2400}{60}$ → 1

$40 l min^{-1}$ → 1 (2)

(25) Drawing perpendicular bisector of AB → 1

Marking the point D → 1 (2)

B කොටස

(01) (i) $\frac{5}{8}$ → 1 (1)

(ii) $\frac{5}{8}$ of $\frac{3}{5}$ or $\frac{5}{8} \times \frac{3}{5}$ → 1

$\frac{3}{8}$ → 1 (2)

(iii) $\frac{3}{8} + \frac{3}{8} = \frac{6}{8}$ → 1

Remaining $\frac{2}{8}$ or $\frac{1}{4}$ → 1

$\frac{1}{4}$ of Salary = 20 000

Total Salary = Rs. 80 000 → 1 (3)

(iv) For Education

= Rs. $\frac{3}{8} \times 80\,000$ → 1

= Rs. 30 000 → 1

Loan instalment = Rs. 20 000

As a fraction of the salary

= $\frac{20\,000}{80\,000}$ → 1

= $\frac{1}{4}$ → 1 (4)

10

(02) (i) Area of the sector

= $\frac{45}{360} \times \frac{22}{7} \times 14 \times 14$ → 2

= $77cm^2$ → 1 (3)

(ii) $\frac{1}{2} \times AB \times 14 = 77$ → 2

AB = 11cm → 1 (3)

(iii) DC = $\frac{45}{360} \times 2 \times \frac{22}{7} \times 14$ → 1

DC = 11cm → 1 (2)

(iv) Perimeter = 14 + 11 + 11 + 17.8 1

= 53.8cm → 1 (2)

10

(03) (i) Num. of shares = $\frac{90\,000}{60}$ → 1

= 1500 → 1 (2)

(ii) Income = 1500 × 7 = 10500 2 (2)

(iii) Selling price of a share

= $\frac{4500}{1500}$ → 1

= Rs. 63 → 1 (2)

(iv) 15 000 × $\frac{12}{100}$ or Rs. 1800 1

16 800 × $\frac{12}{100}$ → 1

= Rs. 2016 → 1

= Rs. 18 816 → 1 (4)

10

(04) (i) $\frac{360^0 - (90^0 + 30^0)}{2}$ → 1

$= 120^0$ → 1 (2)

(ii) $\frac{15}{30^0} \times 120^0$ → 2

$= 60^0$ → 1 (3)

(iii) $\frac{15}{30} \times 360$ → 1

= 180 → 1 (2)

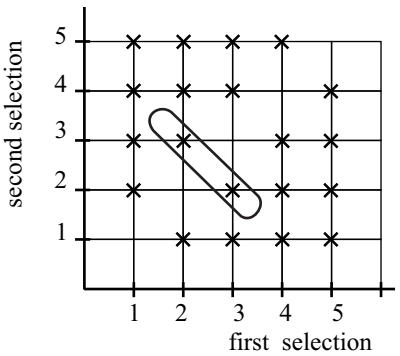
(iv) $\frac{60}{150} \times 360^0$ → 2

(getting 150 -1mark)

$= 144^0$ → 1 (3)

10

(05) (i)



2 (2)

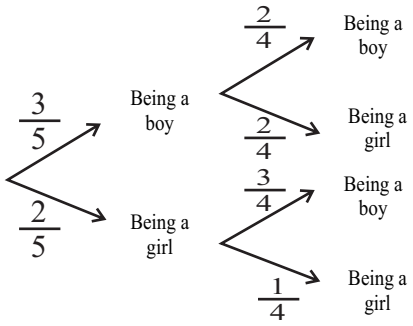
10

(ii) Circling the events → 1

$\frac{2}{20} = \frac{1}{10}$ → 1 (2)

(iii)

first selection second selection



Writing the probability $\frac{3}{5}$ → 1

Drawing the other two branches with the probabilities → 1+1 (3)

(iv) $\frac{3}{5} \times \frac{2}{4} + \frac{2}{5} \times \frac{3}{4}$ → 2

$\frac{12}{20} = \frac{3}{5}$ → 1 (3)

10

(02) (i) 4 → 1 (1)

(ii) Correct axes 1

Marking at least 6 points correctly 1

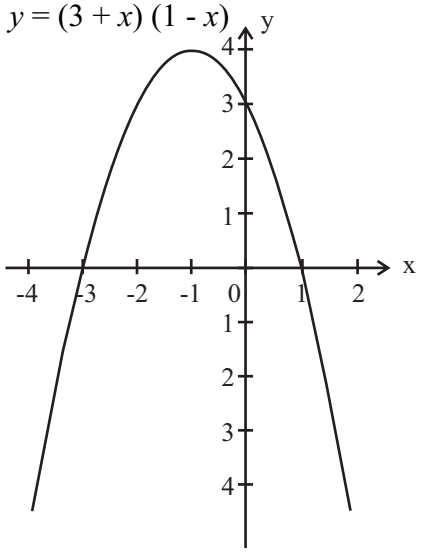
Smooth curve (Graph is on the back page) 1 (3)

(iii) $-3 < x < 1$ 2 (2)

(iv) $y = 4 - (x+1)^2$ 2 (2)

(v) $-1<x<1$ functin decrease from 4 to 0 and at $x = 1$ function becomes 0. 1 1 (2)

Graph of the function $y = (3 + x)(1 - x)$



10

Paper II Part - A

(01) (a) (i) $25000 \times \frac{6}{100}$ → 1

$\frac{15000}{4}$ → 1

Rs. 375 → 1 (3)

(ii) $400 \times 4 =$ රු. 1600 → 1

$\frac{100}{8} \times 1600$ → 1

Rs. 20 000 → 1 (3)

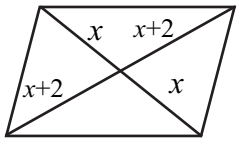
(b) (i) $3\,000 \times 24 - 60000$ → 2

රු. 12 000 → 1

(ii) $\frac{24 \times 25}{2} = 300$ → 1 (4)

10

(03)



$\frac{1}{2} \times x \times (x+2) \times 4 = 14$ → 1

Identifying $(x + 2)$ (1 mark) 1

Getting the area (1 mark) 1

$x(x + 2) = 7$ → 1

$x^2 + 2x - 7 = 0$

$x^2 + 2x + 1 = 8$ → 1

$(x + 1)^2 = 8$

$x + 1 = \pm \sqrt{8}$ → 1

$x = \pm 2\sqrt{2} - 1$ → 1

x is a length $x \neq -2\sqrt{2} - 1$ 1

10

$x = 2\sqrt{2} - 1$

$x = 2 \times 1.41 - 1$ → 1

$= 1.82$

Length of the short diagonal $= 2 \times 1.82$

$= 3.64$cm → 1 (2)

10

(04) (i) Marking the angle of elevation 1

Showing

AC = 50m or AD = 2m → 1 (2)

(ii) $\sin 53^0 4' = \frac{AB}{AC}$ → 1

$AB = 50 \times 0.7993$ → 1

$AB = 39.965$ → 1

$= 40$m → 1 (4)

(iii) Marking θ in the diagram → 1

$\tan\theta = \frac{40 - 2}{20}$ → 1

$\theta = 1.9$ → 1

$\theta = 62^0 14'$ → 1 (4)

10

(05) (a) (i) $x + y = 60$ → 1

$x : y = 2 : 13$

$13x = 2y$ → 2 (3)

(ii) $2x + 2y = 120$ → 1

$2x + 13x = 120$ → 1

$15x = 120$

$x = 8$ → 1

$y = 52$ → 1 (4)

Number of pans of cement 8

Number of pans of sand 52

(b) $\frac{2x^2}{(x-1)(x+1)} \div \frac{x}{x+1}$ 1

$= \frac{2x^2}{(x-1)(x+1)} \times \frac{x+1}{x}$ 1

$= \frac{2x}{(x-1)}$ 1 (3)

10

(06) (i)

Number of shirts	Days f	Mid value x	Deviation f	fx
30 - 40	6	35	-30	-180
40 - 50	7	45	-20	-140
50 - 60	10	55	-10	-100
60 - 70	12	65	0	0
70 - 80	8	75	10	80
80 - 90	7	85	20	140
	$\Sigma f = 50$			$\Sigma fd = 200$

x column → 1

fd column → 2

Σfd → 1

Mean shirts $= 65 - \frac{200}{50}$ 1

$= 61$ → 1

Daily Profit expected → 2

$= 61 \times 150 = $ Rs. 9150

Profit expected from 100 days

$=$ Rs. 9150×100 → 1

$= 9150 < 1000\,000$

expectation cannot be fulfilled 1

10

(07) (a) (i) a = 8, d = 3, n = 10 → 1

$T_{10} = 8 + 9 \times 3$ → 1

$= 35$ → 1 (3)

(ii) $S_{30} = \frac{30}{2}\{2 \times 8 + 29 \times 3\}$ 1

$= 15 \times 103 = 1545$ → 1 (2)

(iii) 5, 10, 15.... 1200

Number of pink colour pages

$1200 = 5 + (n - 1) \times 5$ → 1

$n = 240$ → 1

Number of blue colour papers

$1200 - 240 = 960$ → 1 (3)

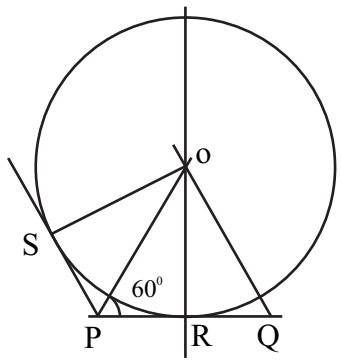
10

(a) (i) $T_{10} = 4 \times \left(\frac{1}{2}\right)^9$ → 1

$= \frac{1}{128}$ → 1 (2)

10

(08)



(i) Drawing PQ = 7cm → 1
Constructing the perpendicular bisector → 2 (3)

(ii) Constructing 60^0 → 1 (1)

(iii) වෘත්තය ඇඳීම → 1

(iv) Joining PQ → 1 (2)

$R\hat{O}Q = 30^0$ → 2 (2)

(v) Constructing PS → 1
Opposite angles supplementary or in the quadrilateral, the opposite angle formed is equal to the interior opposite angle → 1

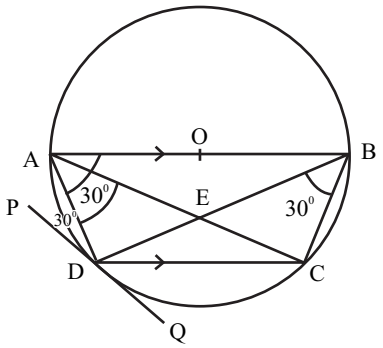
(2)

(iii) $A\hat{B}D = 30^0$ → 1

$A\hat{D}P = A\hat{B}D$ (Angles in the alternate segment → 1

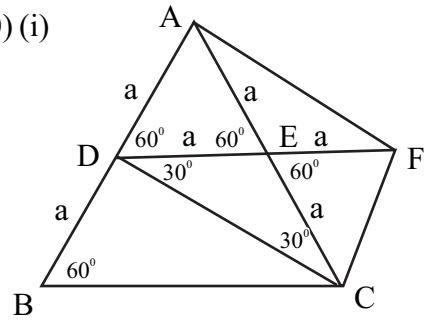
$D\hat{A}C = 30^0$ (Angles in the same segment) 1

AC / / PQ (Alternate angles are equal) (3)



10

(10) (i)



Marking data → 1

Joining DC, AF → 1

DE = $\frac{1}{2}$ BC (Mid point theorem) → 1

AD = AE = DE (ABC is a equilateral triangle) → 1

DE = EF (Data)
AE = EC (E is the Mid point) → 1

ADCF is a parallelogram
(Diagonals bisect each other) 1

also AC = DF → 1
∴ ADCF is a rectangle

10

(09) (i) Copying the diagram → 1

$A\hat{D}C = 120^0$ (allied angles)

$B\hat{C}D = 120^0$ (opposite angles of a cyclic quadrilateral) 1

$A\hat{D}C = B\hat{C}D$ (axioms) 1

$D\hat{A}C = D\hat{B}C = x$ (Angles in the same segment) → 1

DC = DC (common side) → 1

ADC Δ ≡ BCD Δ (A. A. S) (5)

(ii) $O\hat{A}E = 60^0 - x$

$O\hat{B}E = 60^0 - x$ → 1

AE = EB (opposite angles are equal) → 1 (2)

10

Area of ADCF rectangle = 2ADC Area of ADC triangle. (Diagonals bisect the area) Area of ADC Δ=Area of CDBΔ. → 1

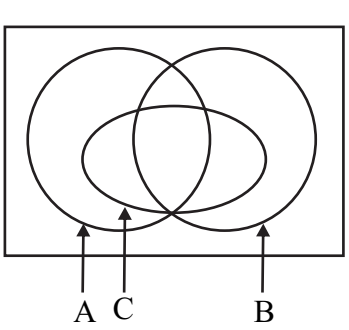
(Same base and same height) CDB ත්‍රිකෝණයේ ව.ඵ. (සමාන ආධාරක හා එකම උච්චය නිසා) → 1

∴ ABC Area of ABCΔ = 2 Area of ADCΔ. → 1

Area of ADCF = Area of ABC Δ

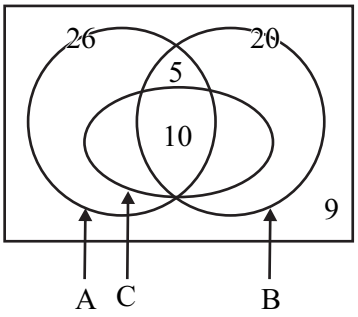
10

(11) (i)



Drawing the set C → 1 (1)

(ii)

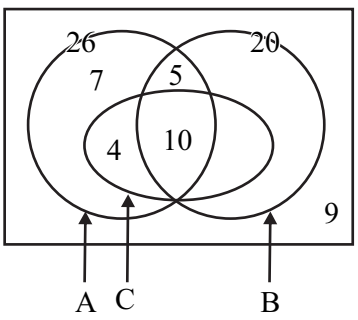


Marking 10 and 9 correctly → 1

A∩B = 26 + 20 - 31 → 2

n(A∩B∩C) = 15 - 10 = 5 → 1 (4)

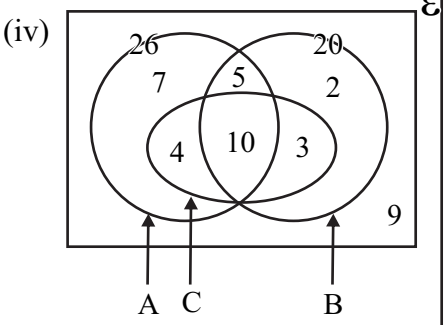
(iii)



Marking 4 and 7 → 1

Number of students who selected only the construction question = 7 → 1 (2)

(iv)



Marking 3 and 2 in correct regions → 1

Number of students in set C

= 4 + 10 + 3

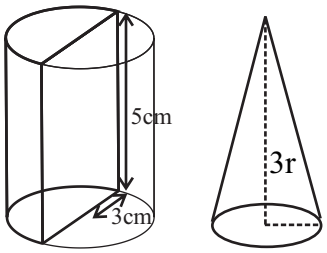
= 17 → 1

Probability

$= \frac{17}{40}$ → (3)

10

(12) (i)



$\frac{1}{2}\ \pi \times 3^2 \times 5 = \frac{1}{3}\ \pi r^2 \times 3r$ → 1

$\frac{45}{2} = r^3$ → 1

$r = \sqrt[3]{\frac{45}{2}}$ → 1 (3)

$lg\ r = \frac{1}{3}\ [lg\ 45 - lg\ 2]$ 1

$= \frac{1}{3}\ [1.6532 - 0.3010]$ 2

$= \frac{1}{3}\ [1.3522]$ → 1

$= 0.4507$ → 1

$r = 2.823$ → 1

$r = 2.82$ cm → 1 (7)

10