

**Department of Education – Western Province**  
**Year End Evaluation - 2019**  
**Grade 11 – Mathematics**  
**Marking Scheme**

**Paper I – Part A**

01.  $\frac{10 \times 6}{15}$   
4 hours

02.  $(5 - 2x)(5 + 2x)$   
 $5^2 - (2x)^2$

03.  $x = 35^\circ$   
 $x + 2x + 75^\circ = 180^\circ$

04.  $770 = \frac{22}{7} \times 7 \times 7 \times h$   
 $h = 5 \text{ cm}$

05.  $2^2 a^2 b / 4 a^2 b$   
 $\left. \begin{array}{l} 2 \times a \times a \\ 2 \times 2 \times 6 \end{array} \right\}$

06.  $\hat{ABC} = 60^\circ$   
 $\hat{ABD} = 120^\circ$

07.  $24 \times 10 \text{ cm}^3$   
 $240 \text{ cm}^3$

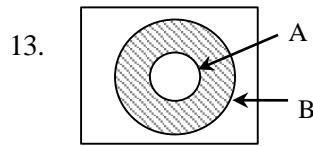
08. Annual interest =  $40\,000 \times \frac{5}{100}$   
= Rs. 2 000  
Time =  $\frac{20\,000}{2\,000}$   
= 10 years

09.  $\hat{ACB} = 90^\circ$   
 $y = 90^\circ + 65^\circ = 155^\circ$

10.  $x = 2$   
 $\frac{4}{x} = 2$

11.  $\frac{750-300}{15}$   
 $30 \text{ ms}^{-1}$

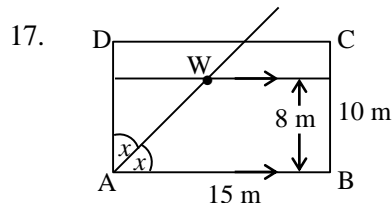
12.  $\hat{AOC} = 84^\circ$   
 $x = 180^\circ - 84^\circ$   
=  $96^\circ$



14. opposite angles  
area

15.  $5.24 = 10^{0.7193}$

16. the boat B is located 40 m away from the foot of the light house at an angle of depression  $30^\circ$  from P



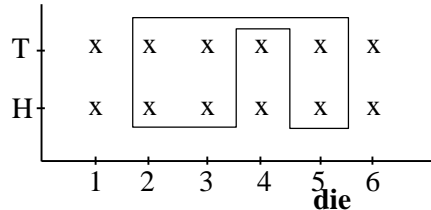
Drawing the parallel line  
Marking the well

18.  $(-1, 2)$

19.  $\hat{BCD} = 100^\circ$  (allied  $\angle$  are supplementary)  
 $\therefore x = 100^\circ$

20.  $\frac{6}{12}$  or  $\frac{1}{2}$

coin



21.  $T_6 = 16 \times 2^5$   
 $T_6 = 2^9$

<p>22. <math>2x \leq -1</math>  <math>x \leq -\frac{1}{2}</math>  largest integer = -1</p>	1 1	②	$77 \times 44 = 22 \times x$ $x = 154$ $\frac{154}{22} = 7$	1 1	③
<p>23. 3, 4, (6), 6, 8, 9, 10, 10, (12), 14, 15</p>	1+1	②	<p>(iv) perimeter = <math>22 \times 2 + 154 \times 2 + 1</math>  = 363 m</p>	1 1	②
<p>24. gradient = <math>\frac{4-0}{4-2}</math>  = 2  (2, 0) and (4, 4)</p>	1 1	②		1 1	② 10
<p>25. PQ = AB or AB = CD  ∴ PQ = 10 cm</p>	1	②	<p>03. (i) (a) A, B, D</p>	1	①
<b>Part B</b>			<p>(ii) <math>500\,000 \times \frac{4}{100} + 500\,000 \times \frac{8}{100}</math>  Rs. 60 000</p>	2 1	③
<p>01. (i) <math>\frac{9}{10}</math>  (ii) <math>\frac{1}{3}</math> of <math>\frac{9}{10}</math> or <math>\frac{9}{10} \times \frac{1}{3}</math>  <math>\frac{3}{10}</math>  (iii) remaining land = <math>\frac{9}{10} - \frac{3}{10}</math>  = <math>\frac{6}{10}</math>  = <math>\frac{3}{5}</math></p>	1 1 1 1 1	① ②	<p>(iii) Rs.1 500 000 income exceeded  Rs. 96 000 – 60 000  Rs. 36 000  income exceeded  <math>\frac{100}{12} \times 36\,000 = \text{re' } 300\,000</math>  income of company E } = 1 500 000 + 300 000  = Rs. 1 800 000</p>	1 1 1 1	③ ④
<p>(iv) portion which is proposed to give  = <math>\frac{2}{3} \times \frac{1}{3}</math>  = <math>\frac{2}{9}</math>  Portion received = <math>\frac{6}{10} \times \frac{1}{3}</math>  = <math>\frac{2}{10}</math>  <math>\frac{2}{9} - \frac{2}{10} = 40</math>  <math>\frac{1}{45} = 40</math></p>	1 1 1	②	<p>(b) Duty charged = <math>60\,000 \times \frac{20}{100}</math>  =Rs. 12 000  Value of the refrigerator = Rs.72 000</p>	1 1	②
<p>Portion of land owned = <math>40 \times 45</math>  = 1 800 perches</p>	1	⑤	<p>04. (a) <b>book borrowed</b> <b>book taken to read</b>  (i) <b>from Suresh</b> <b>by Shamen</b></p>	1 1	⑤
<p>02. (i) PQ arc length = <math>\frac{45}{360} \times 2 \times \frac{22}{7} \times 14</math>  = 11 m  (ii) A = <math>\frac{45}{360} \times \frac{22}{7} \times 14 \times 14</math>  = 77 m<sup>2</sup>  (iii) Area of ABCD = 77 × 44</p>	1 1 2 1 1	② ③	<p>(if all 5 answers are correct) 3  (if only 4 answers are correct) — ②</p>	1 1 3	③



03. (i)  $2x - 1 = y$  — (1)  
 $3x + 4y = 73$  — (2)

(ii)  $2x - y = 1$   
 $8x - 4y = 4$  — (3)

$x = 7$   
 $y = 2 \times 7 - 1$   
 $y = 13$

$x + y = 20$

(iii)  $4x + 10x - 15 \leq 79$   
 $14x \leq 84$

$x \leq 6$

max. number of three wheelers 6

04.  $x^2 + (x+1)^2 = 3^2$

$x^2 + x^2 + 2x + 1 = 9$

$2x^2 + 2x - 8 = 0$

$x^2 + x - 4 = 0$

$\left(x + \frac{1}{2}\right)^2 = 4 + \frac{1}{4}$

$x + \frac{1}{2} = \pm \frac{\sqrt{17}}{2}$

$x = \frac{\sqrt{17} - 1}{2}$

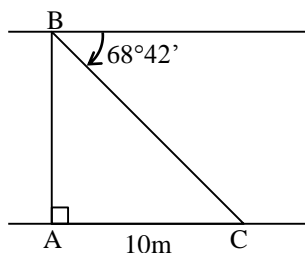
$x = 1.56$

$x + 1 = 2.56$

BD =  $2.56 \times 2$

= 5.1

05. (i)



A, B, C iys;j rEm igyk we|Sug 1

wjfrdayK < )l=Kq lsług' 1

10 m ,l=Kq lsług 1

(ii)  $\tan 68^\circ 42' = \frac{AB}{10}$

$2.564 = \frac{AB}{10}$

$AB = 25.64 \text{ m}$

(iii)  $\sin \theta = \frac{25.64}{36.26}$

$\sin \theta = 0.7071$

$\theta = 45^\circ$

(iv)  $25.64 - 10.0$

$15.64 \text{ m}$

06. Correct mid value column

Correct  $fx$  column

Correct  $\Sigma fx$  column

Class interval	frequency (f)	Mid value (x)	fx
10-14	2	12	24
15-14	3	17	51
20-24	6	22	132
25-29	10	27	270
30-34	5	32	160
35-39	4	37	148
	$\Sigma f = 30$		$\Sigma fx = 785$

Mean =  $\frac{785}{30}$

= 26.16

Mean num. of coconuts 26

Income of 3 months =  $26 \times 8 \times 30 \times 3$

= Rs.18 720

Rs.18 720 < Rs. 19 000

07. (a) (i)

$T_n = a + (n-1)d$

$1 = 109 + (n-1)(-4)$

$n = 28$

number of rows 28

(ii)  $S_n = \frac{n}{2}(a + l)$   
 $S_{28} = \frac{28}{2}(109 + 1)$   
 $S_{28} = 1540$   
 Tot. number of bulbs 1540

(b)  $ar = 6$   
 $ar^2 + ar^3 = 36$   
 $ar(r + r^2) = 36$   
 solving quadratic equation  
 Obtaining  $r = 2$ ,  
 $a = 3$

1  
1  
②  
1  
1  
1  
1  
⑤

10

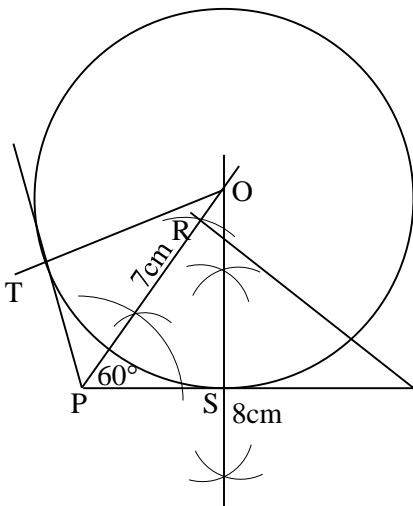
(i) copying the diagram 1  
 $SR \parallel AC$   
 $SR = \frac{1}{2}AC$  {mid point theorem} 1  
 $PQ \parallel AC$   
 $PQ = \frac{1}{2}AC$  {mid point theorem} 1  
 $SR = PQ$  }  
 $SR \parallel PQ$  } 1  
 PQRS is a parallelogram  
 $\therefore PS = QR$  (opp. Sides of the  $\square$ ) 1  
 $AC = BD$  (diagonals of a rectangle are equal) 1  
 $\therefore PQ = QR = RS = PS$

PQRS is a rhombus

(ii) Area  $\triangle APS = \frac{1}{2}AP \times AS$  1  
 Area  $\triangle PBQ = \frac{1}{2}BP \times BQ$  1  
 but  $AP = BP$ ,  $AS = BQ$   
 $\therefore$  Area  $\triangle APS =$  Area  $\triangle PBQ$  1  
 Similarly Area  $\triangle APS =$  Area  $\triangle DSR =$  Area  $\triangle QCR$  1  
 $\therefore$  Area PQRS rhombus = Area ABCD rectangle - 4 Area  $\triangle APS$  10

10  
10

08.



- (i) Drawing PQ 1
- Constructing QPR 1
- Drawing PR 1
- (ii) Constructing perpendicular bisector 2
- (iii) Marking S 1
- Marking O and drawing the circle 1
- (iv) PT tangent 1
- (v)  $\angle POT = 30^\circ$  1
- When two tangents are drawn to a circle 1
- The angles subtended by the tangents at Center are equal ) 1

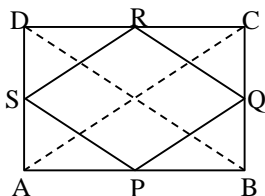
1  
1  
③  
②  
②  
①  
②  
②

10

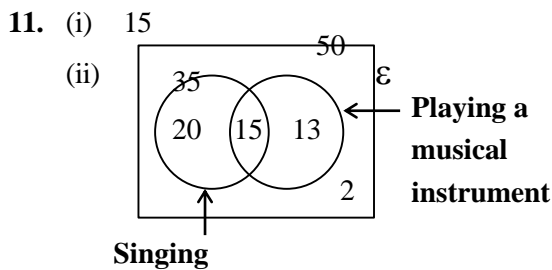
10. Capacity =  $\pi r^2 h - \frac{1}{2} \times \frac{4}{3} \pi r^3$   
 $99 = \pi r^2 \times 3r - \frac{2}{3} \pi r^3$  1+1  
 $99 = 3\pi r^2 - \frac{2}{3} \pi r^3$   
 $99 = \frac{7}{3} \times \frac{22}{7} \times r^3$  1  
 $\frac{3^3}{2} = r^3$  }  
 $r = \frac{3}{\sqrt[3]{2}}$  } 1 ④  
 $\lg r = \lg 3 - \frac{1}{3} \lg 2$  1  
 $= 0.4771 - \frac{1}{3} \times 0.3010$  2  
 $= 0.4771 - 0.1003$   
 $= 0.3768$  1  
 $r = \text{antilog } 0.3768$   
 $= 2.381$  1  
 Radius  $r = 2.38$  cm 1

⑥  
10

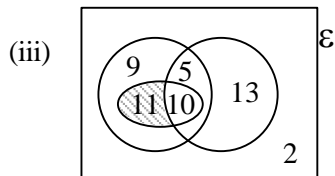
09.



10



Marking 35 and 28  
Writing 2, 20, 15, 13



Including the subset winners  
Marking 5, 10  
Marking 9, 11

(iv) Shading the correct region

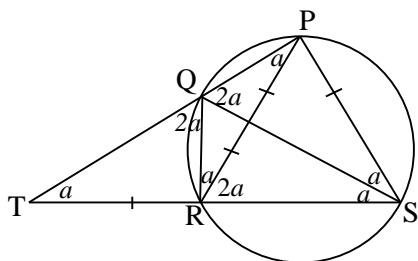
1	①
1	
4	⑤
1	
1	
1	③
1	①
10	

PQS and QRT  $\Delta$   
 $\hat{QSP} = \hat{QTR}$  (proved above)  
 $TR = PS$  (data)  
 $\hat{TQR} = \hat{PQS}$  (proved above)  
 $\therefore PQS \Delta = QRT \Delta$  (A. A. S)

(iii) If  $a = 30^\circ$  then  $\hat{QRS} = 90^\circ$

1	①
1	
1	
1	⑤
1	
1	
1	
10	

12.



(i)  $\hat{PTR} = \hat{TPR}$  ( $PR = RT$ )  
 $\hat{PRS} = \hat{PTR} + \hat{TPR}$  (in a  $\Delta$  when a side is produced the exterior  $\sphericalangle$  formed = Interior opposite  $\sphericalangle$ )  
 $\therefore \hat{PRS} = 2 \hat{QPR}$   
 but  $\hat{QPR} = \hat{QSR}$  ( $\sphericalangle$  in the same segment)  
 also  $\hat{PRS} = \hat{PSR}$  ( $PR = PS$ )  
 $\therefore \hat{QSP} = \hat{QSR}$

(ii)  $\hat{PQS} = \hat{PRS}$  ( $\sphericalangle$  in the same segment)  
 $\hat{TQR} = \hat{PSR}$  (in a cyclic quadrilateral the Exterior angle = interior opposite angle)

1	
1	
1	
1	④
1	
1	