

# **INDIAN SCHOOL MUSCAT**

## **FINAL EXAMINATION**

## SET ABC

JANUARY 2021

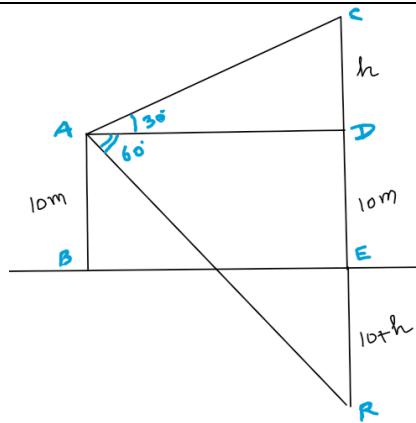
CLASS X

## **Marking Scheme – MATHEMATICS**

Q.NO.	Answers	Marks (with split up)
1.	Non – terminating but recurring <b>(OR)</b>	1
2.	D (zeroes are -3, -1/2)	1
3.	$k = 6$ (Also k not equal to -6) <b>(OR)</b>	1
4.	$m = 3$	1
5.	$p = 15$	1
6.	D = -31, No real roots.	1
7.	$b = 4$	1
8.	$AB$ parallel to $QR$ as $\frac{PA}{PQ} = \frac{PB}{BR} = \frac{2}{3}$	1
9.	Diameter = d = 10cm. <b>(OR)</b> $\angle COD = 180^\circ - 125^\circ = 55^\circ$	1
10.	$\angle POQ = 100^\circ$ (since $90^\circ - 50^\circ = 40^\circ$ radius perpendicular to tangent)	1
11.	The ratio is 4:5	1
12.	$x - y = 1$ .	1
13.	$\theta = 30^\circ$	1
14.	$\pi R^2 = \pi(24^2 + 7^2)$ $R^2 = 625 \rightarrow R = 25 \text{ cm}$ D = 50 cm.	1
15.	$a^3 : \frac{4}{3}\pi r^3$ <b>(OR)</b> $\rightarrow (2r)^3 : \frac{4}{3}\pi r^3$ $\rightarrow 6 : \pi$	1
16.	$P(\text{different numbers}) = \frac{30}{36} = \frac{5}{6}$  <b>(OR)</b> $P(\text{neither green nor red}) = \frac{52 - (2+26)}{52} = \frac{24}{52} = \frac{6}{13}$	1
17.	(i) (opt a) Perpendicular bisector of line joining AB (ii) (opt b) (8, 4) (iii) (opt d) $2\sqrt{5}$ (iv) (opt c) (6, 0) (v) (opt a) 5	1 + 1 + 1 + 1
18.	(i) (opt c) Height of the tent = 2.25m (ii) (opt b) AG = 0.8 m	1 + 1 + 1 + 1

	(iii) (opt b) $\frac{4}{25}$ (iv) (opt a) $\frac{AG}{AE} = \frac{AB}{BF}$ (v) (opt a) 185 cm	
19.	(i) (opt a) - 60 (ii) (opt c) 2940 (iii) (opt b) 600 (iv) (opt c) 70800 (v) (opt b) 1985	1 + 1 + 1 + 1
20.	(i) (opt a) 14 (ii) (opt c) 100 - 110 (iii) (opt b) 115 (iv) (opt c) 112 mins (v) (opt d) 230	1 + 1 + 1 + 1
	<b>2 marks</b>	
21.	Prime factorization/Reason	1 + 1
22.	$\alpha = 4, \alpha\beta = 28, \beta = 7, \alpha + \beta = 11$ $x^2 - 11x + 28$ <b>(OR)</b> Factorisation/ Writing the zeroes	1 1 1 + 1
23.	AM = 3 cm, MC = 6 cm LC = 6 cm, BL = 4 cm Therefore, BC = 10 cm Reason	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
24.	Circle and external point Perpendicular bisector Tangents and measures	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$
25.	Let P (0, y) be the point such that AP = PB Substitution and y = - 38 P(0, -38) <b>(OR)</b> Formula /P $\left( \frac{1 \times 5 + 2 \times 2}{1+2}, \frac{1 \times -8 + 2 \times 1}{1+2} \right) = \left( \frac{9}{3}, \frac{-6}{3} \right) = (3, -2)$	$\frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$
26.	Figure/Ratio/Substitution/Answer	$\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$
	<b>3 marks</b>	
27.	Assumption/Equating to p/q Simplification Conclusion	$\frac{1}{2} + \frac{1}{2}$ $1\frac{1}{2}$ $\frac{1}{2}$
28.	$\frac{1}{x-4} - \frac{1}{x-7} = \frac{11}{30}$ $x^2 - 3x + 2 = 0$ $x = 1 \text{ or } x = 2$	2 1
29.	Given/To prove/figure Proof with proper reasoning <b>(for both questions)</b>	1 2
30.	LHS = $\frac{\sin\theta(1-2\sin^2\theta)}{\cos\theta(2\cos^2\theta-1)}$ = $\frac{\tan\theta(1-2\sin^2\theta)}{[2(1-\sin^2\theta)-1]}$ = $\frac{\tan\theta(1-2\sin^2\theta)}{(1-2\sin^2\theta)} = \tan\theta = RHS$	1 1 1

31.	$a^2 = 49 \times 4 \rightarrow a = 14$ $r = \frac{a}{2} = 7 \text{ cm}$ Area of 3 sectors = $3 \times \frac{60}{360} \times \pi \times 7 \times 7 = 77 \text{ cm}^2$ <b>(OR)</b> $r = 10 \text{ cm and } \theta = 90^\circ$ $\text{Area of minor Segment} = \frac{1}{4}\pi r^2 - \frac{1}{2}bh$ $= \frac{1}{4} \times 3.14 \times 100 - 50 = 78.5 - 50 = 28.5 \text{ cm}^2$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$																																
32.	<table border="1"> <thead> <tr> <th>x</th><th>f</th><th>d</th><th>fd</th></tr> </thead> <tbody> <tr><td>40</td><td>7</td><td>-80</td><td>-560</td></tr> <tr><td>80</td><td>5</td><td>-40</td><td>-200</td></tr> <tr><td>120</td><td>16</td><td>0</td><td>0</td></tr> <tr><td>160</td><td>12</td><td>40</td><td>480</td></tr> <tr><td>200</td><td>2</td><td>80</td><td>160</td></tr> <tr><td>240</td><td>3</td><td>120</td><td>360</td></tr> <tr><td></td><td>45</td><td></td><td>240</td></tr> </tbody> </table> $A = 120$ $\bar{x} = 120 + \frac{240}{45} = 120 + 5.33 = 125.33$	x	f	d	fd	40	7	-80	-560	80	5	-40	-200	120	16	0	0	160	12	40	480	200	2	80	160	240	3	120	360		45		240	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
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33.	$P(\text{Acceptable by Veer}) = \frac{23}{55}$ $P(\text{Acceptable by Jerin}) = \frac{30}{55} = \frac{6}{11}$ $P(\text{Acceptable to None}) = \frac{14}{55}$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$																																
	<b>5 marks</b>																																	
34.	Let the width = x cm and length = y cm. Given: $y = x + 6$ $\text{Perimeter} = 52 \text{ cm}$ $2(x + y) = 52 \rightarrow x + y = 26$ Solutions of two equations Graphs of two equations $x = 10 \rightarrow y = 16$ Width = 10 cm and Length = 16 cm.	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$																																
35. a)	In triangle ADC, $\tan 30^\circ = \frac{h}{x} \rightarrow x = h\sqrt{3} \quad \dots(1)$ In triangle ADR, $\tan 60^\circ = \frac{20+h}{x} \rightarrow 20 + h = x\sqrt{3}$ $x = \frac{20+h}{\sqrt{3}} \quad \dots(2)$ Solving (1) and (2) and obtaining $h = 10 \text{ m}$ Height = 20 m. <b>(OR)</b>	fig -1 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$																																



	<p>AB = tower      Let BC = x m      CD = 2x m  <math>\tan 60 = \frac{h}{x} \rightarrow h = \sqrt{3}x</math>  <math>\tan \theta = \frac{h}{3x} = \frac{\sqrt{3}x}{3x} = \frac{1}{\sqrt{3}}</math>  <math>\theta = 30^\circ</math></p>	<p>figure – 1      assumptions-1      1      1      1      1</p>																											
36.	<p>Total Volume occupied by 'n' bricks = <math>\frac{7}{8}</math> volume of the wall  <math>n(l \times b \times h) = L \times B \times H</math>  <math>n = \frac{7}{8} \times \frac{270 \times 300 \times 350}{22.5 \times 11.25 \times 8.75} = 11,200 \text{ bricks}</math></p>	<p><math>\frac{1}{2}</math>      1  <math>1 + 1 + 1\frac{1}{2}</math></p>																											
	<b>SET B</b>																												
26.	Figure Steps & Answer	1 1																											
28.	$\frac{1}{x} - \frac{2}{2x-3} = \frac{1}{x-2}$ $2x^2 - 8x + 6 = 0$ $x^2 - 4x + 3 = 0$ $x = 1 \text{ or } x = 3$	$1$ $1$ $1$																											
30.	Opening brackets with algebraic identity Grouping and using trigonometric identities Simplification with trigonometric identities	1 1 1																											
32.	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>x</th> <th>f</th> <th>fx</th> </tr> </thead> <tbody> <tr> <td>12</td> <td>3</td> <td>36</td> </tr> <tr> <td>14</td> <td>6</td> <td>84</td> </tr> <tr> <td>16</td> <td>9</td> <td>144</td> </tr> <tr> <td>18</td> <td>13</td> <td>234</td> </tr> <tr> <td>20</td> <td>f</td> <td>20f</td> </tr> <tr> <td>22</td> <td>5</td> <td>110</td> </tr> <tr> <td>24</td> <td>4</td> <td>96</td> </tr> <tr> <td></td> <td>40+f</td> <td>704 + 20f</td> </tr> </tbody> </table>	x	f	fx	12	3	36	14	6	84	16	9	144	18	13	234	20	f	20f	22	5	110	24	4	96		40+f	704 + 20f	$1\frac{1}{2}$
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	$\frac{704+20f}{40+f} = 18$ $f = 8$	$1\frac{1}{2}$																											
33.	$P(\text{Apple}) = \frac{15}{27} = \frac{5}{9}$ $P(\text{Orange}) = \frac{12}{26} = \frac{6}{13}$ $P(\text{Good Apple}) = \frac{11}{13}$	$1$ $1$ $1$																											
36.	<p>Let the cost of 1 pen = ₹x and the cost of 1 pencil box = ₹y      Framing <math>x + y = 25</math>      Framing <math>3x = y + 15</math>      Solutions of two equations      Graphs of two equations</p>	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ $1 + \frac{1}{2}$																											

	$x = 10 \Rightarrow y = 15$ Final answer	$\frac{1}{2}$ $\frac{1}{2}$
35.	Volume of the cylindrical pipe = <i>volume of the cuboidal block</i> $\pi(R^2 - r^2)h = L \times B \times H$ $h = \frac{440 \times 260 \times 100 \times 7}{22 \times 65 \times 5} = 11,200 \text{ cm} = 112\text{m}$	$\frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ $1 + 1 + 1 + \frac{1}{2}$
<b>End of the marking scheme</b>		