Federal Board SSC-I Examination
Model Question Paper Mathematics
(Curriculum 2022-23)

ROLL NUMBER					
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

Version No.			
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

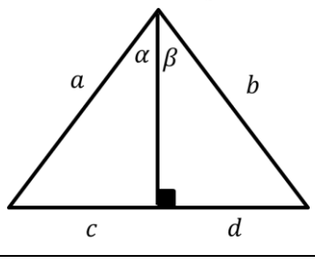
Section - A (Marks 15)

Time Allowed: 20 minutes

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. *Do not use lead pencil.*

Candidate Sign. _____ **Invigilator Sign. _____**

Q1. Fill the relevant bubble against each question. Each part carries one mark.

Sr no.	Question	A	B	C	D	A	B	C	D
i.	The radical form of $x^{-\frac{3}{2}}$ is:	$\sqrt[3]{x^2}$	$\frac{1}{\sqrt{x^3}}$	$\sqrt{x^3}$	$\frac{1}{\sqrt[3]{x^2}}$	○	○	○	○
ii.	Which of the given options represents the scientific notation of 0.25^2 ?	625×10^{-4}	62.5×10^{-3}	6.25×10^{-2}	0.625×10^{-1}	○	○	○	○
iii.	If $A = \{2,4,6\}$ and $B = \{0,1\}$, then find number of elements in $A \times B$.	5	6	8	9	○	○	○	○
iv.	What is the least common multiple of $7x - 6xy$ and $5xy^3 - 3x^2$?	$(7-6y) \times (5x^3 - 3x)$	$(7x - 6xy) \times (5y^3x - 3x^2)$	$x(7-6y)$	$x(7-6y) \times (5y^3 - 3x)$	○	○	○	○
v.	Solution of inequality $-2x - \frac{1}{2} \leq \frac{3}{2}$ is:	$x > -1$	$x < -1$	$x \geq -1$	$x \leq -1$	○	○	○	○
vi.	What is the radian measure of $15^o50'$?	$\frac{19\pi}{216}$	$\frac{19\pi}{36}$	$\frac{19\pi}{180}$	$\frac{216\pi}{19}$	○	○	○	○
vii.	If a navigator gives bearing 0°, in which direction should he travel?	North	South	East	West	○	○	○	○
viii.	In the figure, if $\alpha = \beta$ then what is the value of b? 	$\frac{cd}{a}$	$\frac{c}{ad}$	$\frac{ad}{c}$	$\frac{ac}{d}$	○	○	○	○

ix.	What is the value of $-3-3\tan^2\theta$ in a single trigonometric function?	$3cosec^2\theta$	$-3\sec^2\theta$	$3\sec^2\theta$	$-3cosec^2\theta$	○ ○ ○ ○
x.	Which of the following points is the intersection of the angle bisectors of a triangle?	circumcenter	orthocenter	incentre	centroid	○ ○ ○ ○
xi.	Each of the internal angle of a regular hexagon is:	60^o	72^o	108^o	120^o	○ ○ ○ ○
xii.	Locus of points equidistant from $P(5,4)$ and $Q(5,-6)$ is:	$x=0$	$x=5$	$y=-1$	$y=1$	○ ○ ○ ○
xiii.	The mean of 11 numbers is 7. One of the numbers 13 is deleted. What is the mean of the remaining 10 numbers?	7.7	6.4	6.0	5.8	○ ○ ○ ○
xiv.	What is the probability of picking a king from well-shuffled 52 playing cards?	$\frac{1}{52}$	$\frac{1}{13}$	$\frac{4}{13}$	$\frac{1}{26}$	○ ○ ○ ○
xv.	A fair coin is tossed twice, then the frequency of appearing head twice is:	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{3}{4}$	○ ○ ○ ○

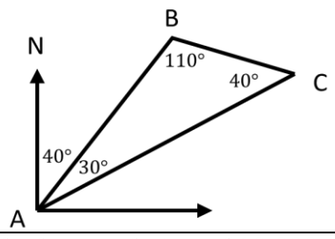
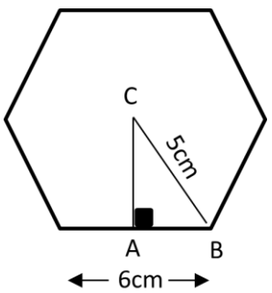
Federal Board SSC-I Examination
Model Question Paper Mathematics
(Curriculum 2022-23)

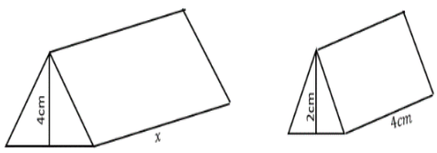
Time allowed: 2.40 hours | Total Marks: 60

Note: Answer all parts from Section 'B' and all questions from Section 'C' on the **E-sheet**. Write your answers on the allotted/given spaces.

SECTION – B (Marks 36)

$(9 \times 4 = 36)$

Q.2	Question	Marks		Question	Marks
i.	Simplify the expression $\left[(125)^{\frac{1}{3}} \times (25)^{\frac{1}{2}} + (64)^{\frac{2}{3}} \times 6 + (8)^{\frac{2}{3}}\right]^{\frac{-2}{3}}$	4	***OR***	If $X = \{1,3,9\}, Y = \{3,5,7\}$ and $Z = \{3,5,7,9,11\}$ then using Venn diagram, prove that $X \cup (Y \cap Z) = (X \cup Y) \cap (X \cup Z)$	4
ii.	The attached figure shows the position of three points A, B, and C. State the bearing of: B from A; A from B; B from C, and C from B. 	4	***OR***	For $A = \{1,2,3\}, B = \{3,4\}$ (a) List all the ordered pairs of the Cartesian Product $A \times B$, (b) List all the ordered pairs of a relation $R = \{(x,y) \mid x \epsilon A, y \epsilon B \wedge x < y\}$, (c) Find domain and range of the relation R.	4
iii.	Bani Gala had a population of 10,000 people in the year 2015. The population has been growing exponentially at a rate of 2.5% per year. Using the exponential growth formula $P(t) = P_o e^{rt}$, apply laws of logarithm to determine the year when population reaches up to 25,000.	4	***OR***	Find equation of the family of lines passing through a point $(5,2)$ and through the intersection of lines $x + 2y - 10 = 0$ and $2x + y - 2 = 0$.	4
iv.	Solve the linear equation $\frac{1}{3}(x-2) + \frac{2-3x}{2} = \frac{x+5}{6}$	4	***OR***	Simplify $\frac{5}{5+p-18p^2} - \frac{2}{2+5p+2p^2}$	4
v.	Prove that: $\frac{1}{1+cosx} + \frac{1}{1-cosx} = 2 + 2\cot^2 x$	4	***OR***	In the given figure, find area of a regular hexagonal roof of a building shown below. 	4

vi.	A hiking trail rises 500 meters over a horizontal distance of 2 kilometers. What is the slope of a trail? Express the slope in percentage.	4	***OR***	A decagonal die labeled 4,4,4,4,5,5,6,7,8,8 is rolled once. Find the probability of an odd number, an even number, and a factor of 12.	4
vii.	A triangular garden XYZ shows corners $X(-4,-4)$, $Y(12,0)$ and $Z(4,8)$ geometrically. Find locus of the corners equidistant from XZ and YZ.	4	***OR***	Given the equation of a line $y = 4x - 2$ and a point $(1, 2)$, how would you determine the equation of a line that passes through this point and is perpendicular to the given line? Express your final answer in the form $y = mx + c$	4
viii.	In the adjacent similar figures,  find the value of x and the ratio of volumes v_1 and v_2.	4	***OR***	A fair die is rolled 75 times and 5 appears up 20 times, what is the relative frequency of appearing any number up except 5.	4
ix.	Find the HCF of the polynomials $x^3 + 2x^2 - 4x - 8$ and $2x^3 + 7x^2 + 4x - 4$	4	***OR***	In a 50-over cricket match, average runs scored by Pakistani team for different sessions of the innings is given below: The score in 01 to 10 overs: 12 runs per over, 11 to 35 overs: 06 runs per over, 36 to 50 overs: 13 runs per over. Find average runs scored by the team in an innings.	4

SECTION – C (Marks 24)

$(3 \times 8 = 24)$

Note: Attempt all questions. Marks of each question are given.

Q. No.	Question	Marks		Question	Marks
Q3	For what value of k, the expression $y^4 + 4y^2 + k + \frac{8}{y^2} + \frac{4}{y^4}$ becomes a perfect square.	8	***OR***	Slopes of the sides of a triangle ABC are given as $m_1 = \frac{3}{2}$, $m_2 = -\frac{3}{2}$ and $m_3 = 2$. Find interior angles of the triangle ABC.	8
Q4	The height H of the tide at a coastal location varies over a day, modeled by $H = H_o + A \cdot sin\left(\frac{2\pi t}{T}\right)$, with H_o: the average tide height, A: the amplitude of tidal variation, t: the time in hours, and T: the period of tidal cycle in hours. If $H_o = 2m, A = 1m, T = 24hours$ use trigonometry to find the tide's height at $t = 0, 6, 18$ hours.	8	***OR***	Transform $-2x + 5y = 10$ in the following: (i) Two points form (ii) Two Intercepts form (iii) Symmetric form and (iv) Normal form	8

<table>
<tr>
<td>Q5</td>
<td>Construct altitudes of triangle ABC with side measures $m\overline{AB} = 4.8cm$, $m\overline{BC} = 3.5cm, m\overline{AC} = 4cm$ and show that the altitudes are concurrent. Write down the construction steps also.</td>
<td>8</td>
<td>OR</td>
<td>The grouped data for a company’s monthly expense (in million rupees) is given as:
<table>
<tr><td>C-I</td><td>140 – 149</td><td>150 – 159</td><td>160 – 169</td><td>170 – 179</td></tr>
<tr><td>f</td><td>3</td><td>7</td><td>5</td><td>9</td></tr>
</table>
Calculate the median and mode expense for 24 months.</td>
<td>8</td>
</tr>
</table>