Federal Board SSC-I Examination
Model Question Paper Mathematics

(Curriculum 2022-23)

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.*
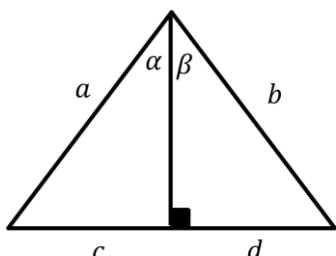
Candidate Sign. _____   Invigilator Sign. _____

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:	$\sqrt[3]{x^2}$	$\dfrac{1}{\sqrt{x^3}}$	$\sqrt{x^3}$	$\dfrac{1}{\sqrt[3]{x^2}}$	O	O	O	O
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}	O	O	O	O
iii.	If $A = \{2,4,6\}$ and $B = \{0,1\}$, then find number of elements in $A \times B$.	5	6	8	9	O	O	O	O
iv.	What is the least common multiple of $7x - 6xy$ and $5xy^3 - 3x^2$?	$(7 - 6y) \times (5x^3 - 3x)$	$(7x - 6xy) \times (5y^3x - 3x^2)$	$x(7 - 6y)$	$x(7 - 6y) \times (5y^3 - 3x)$	O	O	O	O
v.	Solution of inequality $-2x - \frac{1}{2} \le \frac{3}{2}$ is:	$x > -1$	$x < -1$	$x \ge -1$	$x \le -1$	O	O	O	O
vi.	What is the radian measure of $15^o 50'$?	$\dfrac{19\pi}{216}$	$\dfrac{19\pi}{36}$	$\dfrac{19\pi}{180}$	$\dfrac{216\pi}{19}$	O	O	O	O
vii.	If a navigator gives bearing $0°$, in which direction should he travel?	North	South	East	West	O	O	O	O
viii.	In the figure, if $\alpha = \beta$ then what is the value of b?	$\dfrac{cd}{a}$	$\dfrac{c}{ad}$	$\dfrac{ad}{c}$	$\dfrac{ac}{d}$	O	O	O	O

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

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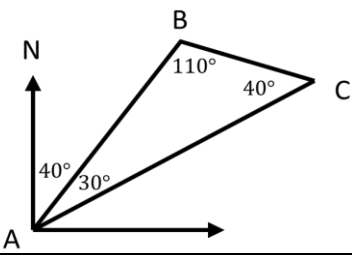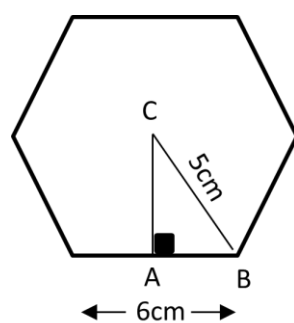(Curriculum 2022-23)
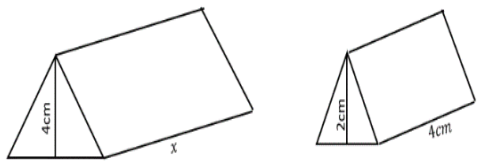
Time allowed: 2.40 hours

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 $R = \{(x,y)\|x\epsilon A, y\epsilon B \wedge x < y\}$, (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 $H_o = 2m, A = 1m, T = 24 hours$ 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

| Q5 | 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. | 8 | *OR* | The grouped data for a company's monthly expense (in million rupees) is given as: | 8 |

The grouped data for a company's monthly expense (in million rupees) is given as:

C-I	140 – 149	150 – 159	160 – 169	170 – 179
f	3	7	5	9

Calculate the median and mode expense for 24 months.