INDIAN SCHOOL AL WADI AL KABIR

Department: Mathematics

Class X **Sample Question Paper – Set 1** **29-08-2021**

MCQ, ASSERTION & REASONING, CASE STUDY

Part I

(MCQ) 1mark each

Q.1.	The largest number which divides 70 and 125 leaving remainders 5 and 8 respectively is							
	A	13	**B**	35	**C**	875	**D**	1750
Q.2.	For what value of k, the pair of equations $2x + 3y + 5 = 0$ and $kx + 4y = 10$ has a unique solution?							
	A	$k = \frac{8}{3}$	**B**	$k \neq \frac{8}{3}$	**C**	$k = 3$	**D**	$k \neq 3$
Q.3.	If (a, b) is the mid-point of the line segment joining the points A (10, –6) and B (k, 4) and $a - 2b = 18$, the value of k is							
	A	30	**B**	4	**C**	22	**D**	40
Q.4.	If ΔABC and ΔPQR are similar triangles such that $\angle P = 40°$ and $\angle B = 55°$, then $\angle R$ is							
	A	85°	**B**	95°	**C**	90°	**D**	100°
Q.5.	In ΔABC, D and E are points on side AB and AC respectively such that DE ∥ BC. IF AE = 2cm, AD = 3cm and BD = 4.5cm then CE is							
	A	3cm	**B**	4cm	**C**	30cm	**D**	6cm
Q.6.	The distance between the points (– 1, – 3) and (5, – 2) is							
	A	$\sqrt{61}$ units	**B**	$\sqrt{17}$ units	**C**	5 units	**D**	$\sqrt{37}$ units
Q.7.	One card is drawn at random from a well – shuffled deck of 52 cards. What is the probability of getting a Jack?							
	A	$\frac{3}{26}$	**B**	$\frac{1}{52}$	**C**	$\frac{1}{13}$	**D**	$\frac{3}{52}$

Q.8.	The circumference of a circle is 100cm. The side of a square inscribed in the circle is							
	A	$50\sqrt{2}$cm	**B**	$\frac{100}{\pi}$ cm	**C**	$\frac{50\sqrt{2}}{\pi}$ cm	**D**	$\frac{100\sqrt{2}}{\pi}$ cm
Q.9.	In a right triangle ABC, right – angled at B, if tan A = 1, then the value of 2 sin A cos A is							
	A	0	**B**	1	**C**	$\frac{1}{2}$	**D**	Not defined
Q.10.	$2cos^2 30°$ - 1 is equal to							
	A	sin60°	**B**	cos60°	**C**	tan60°	**D**	sec60°
Q.11.	If the distance of P (x, y) from the points A (3, 6) and B (-3, 4) are equal, then 3x + y is							
	A	4	**B**	5	**C**	8	**D**	12
Q.12.	cos^4A - sin^4A is equal to							
	A	1 – 2 cos^2A	**B**	2 sin^2A - 1	**C**	sin^2A - cos^2A	**D**	2 cos^2A - 1
Q.13.	The perimeter of a quadrant of a circle of radius $\frac{7}{2}$ cm is							
	A	12.5 cm	**B**	3.5 cm	**C**	7.5 cm	**D**	5.5 cm
Q.14.	The value of (1 + $tan^2\theta$) (1 + sin θ) (1 - sin θ)							
	A	0	**B**	1	**C**	2	**D**	4
Q.15.	The coordinates of the point P which divides the join of A (-2, 5) and B (3, -5) in the ratio 2: 3 are							
	A	(1, 0)	**B**	(2, 0)	**C**	(3, 0)	**D**	(0, 1)
Q.16.	If HCF (16, y) = 8 and LCM (16, y) = 48, then the value of y is							
	A	24	**B**	16	**C**	8	**D**	4
Q.17.	If one zero of the quadratic polynomial x^2 + 3x + k is 2, then the value of k is							
	A	10	**B**	-10	**C**	5	**D**	-5

Q.18.	A fraction becomes $\frac{1}{3}$ when 2 is subtracted from the numerator and it becomes $\frac{1}{2}$ when 1 is subtracted from the denominator. The fraction is							
	A	$\frac{2}{5}$	**B**	$\frac{5}{18}$	**C**	$\frac{4}{13}$	**D**	$\frac{7}{15}$
Q.19.	A Quadratic polynomial whose zeroes are –4 and –5, is							
	A	x^2- 9x +20	**B**	x^2 + 9x + 20	**C**	x^2- 9x - 20	**D**	x^2 + 9x - 20
Q.20.	If ΔABC ~ Δ DEF, BC = 4 cm, EF = 5 cm and area of ΔABC = 80 cm^2, then area of ΔDEF is							
	A	$100cm^2$	**B**	$150cm^2$	**C**	$125cm^2$	**D**	$200cm^2$
Q.21.	If $sec\theta + tan\theta = 7$, then $sec\theta - tan\theta$ is							
	A	$\frac{1}{7}$	**B**	7	**C**	6	**D**	49
Q.22.	A die is thrown once. What is the probability of getting a number greater than 4?							
	A	$\frac{1}{2}$	**B**	$\frac{1}{5}$	**C**	$\frac{1}{4}$	**D**	$\frac{1}{3}$
Q.23.	In a circle of radius 21cm, an arc subtends an angle of 60° at the centre. The length of the arc is							
	A	44 cm	**B**	27 cm	**C**	22 cm	**D**	11 cm
Q.24.	A wheel has diameter 84 cm. The number of complete revolutions it makes to cover 792 metres is							
	A	300	**B**	160	**C**	100	**D**	220
Q.25.	The probability of guessing the correct answer to a certain test is $\frac{p}{12}$. If the probability of not guessing the correct answer to this question is $\frac{1}{3}$, then the value of p is							
	A	2	**B**	4	**C**	6	**D**	8
Q.26.	Three bells ring at an interval of 4, 7 and 14 minutes. All three bells rang together at 6am. At what time the three bells will ring together next?							
	A	6:20 am	**B**	6:24 am	**C**	6:28 am	**D**	6:30 am
Q.27.	If $\frac{4}{x}$ + 3y = 8; $\frac{6}{x}$ - 4y = -5, then							
	A	x = 2, y = 2	**B**	x = 1, y = -1	**C**	x = 2, y = -2	**D**	x = 3, y = -3

Section – B ASSERTION AND REASON Type Questions (1 mark each)	
	DIRECTION: In each of the following questions, a statement of Assertion is given followed by a corresponding statement of Reason just below it. Mark the correct choice as: A) Both Assertion and Reason are true and Reason is the correct explanation of Assertion. B) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion. C) Assertion is true but Reason is false. D) Assertion is false but Reason is true.
Q.28.	**Assertion:** $\frac{13}{3125}$ is a terminating decimal fraction. **Reason:** If q = 2^n5^m where n and m are non-negative integers, then $\frac{p}{q}$ is a terminating decimal fraction.
Q.29.	**Assertion:** For k = 6, the system of linear equations x + 2y + 3 = 0 and 3x + ky + 6 = 0 is inconsistent. **Reason:** The system of linear equations a_1x + b_1y + c_1 = 0 and a_2x + b_2y + c_2 = 0 is inconsistent if $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$.
Q.30.	**Assertion:** In a right -angled triangle, if cosθ = $\frac{1}{2}$ and sinθ = $\frac{\sqrt{3}}{2}$, then tanθ = $\sqrt{3}$ **Reason:** tanθ = $\frac{\sin\theta}{\cos\theta}$
Q.31.	**Assertion:** In a circle of radius 6cm if the angle of the sector is 60°, then the area of the sector is 18 $\frac{6}{7}cm^2$. **Reason:** Area of a circle with radius r is πr^2.
Q.32.	**Assertion:** If a box contains 5 white, 2 red and 4 black marbles, then the probability of not drawing a white marble from the box is $\frac{5}{11}$. **Reason:** P($\bar{E}$) = 1 – P(E), where E is any event.
Q.33.	**Assertion:** If the outer and inner diameter of a circular path are 10 m and 6 m respectively, then area of the path is 16π m^2. **Reason:** If R and r be the radius of outer and inner circular path respectively, then area of the circular path = π ($R^2 - r^2$).

Q.34.	**Assertion:** Number of possible outcomes when two different coins are tossed simultaneously is 4. **Reason:** When two different coins are tossed simultaneously, then the possible outcomes are HH, HT, TH, TT
Q.35.	**Assertion:** The values of x for which the distance between the points P (2, -3) and Q (x, 5) is 10 are 8 and -4 **Reason:** The distance of a point P (x, y) from the origin (0, 0) is $\sqrt{x^2 + y^2}$.
Q.36.	**Assertion:** Mid-point of a line segment divides the line segment in the ratio 1: 1. **Reason:** The ratio in which the point (-3, k) divides the line segment joining the points (-5, 4) and (-2, 3) is 1: 2.

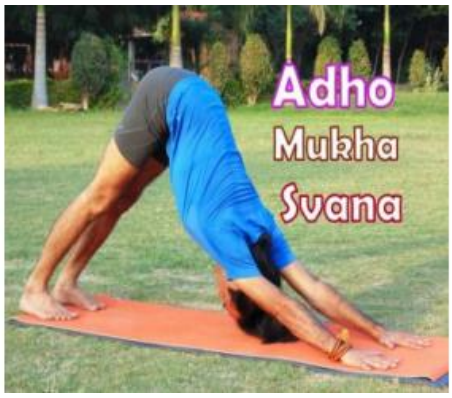
Part II

CASE STUDY-BASED questions (1 x 4 = 4 marks each)

Q.37

Case study-based 1:

An asana is a body posture, originally and still a general term for a sitting meditation pose, and later extended in hatha yoga and modern yoga as exercise, to any type of pose or position, adding reclining, standing, inverted, twisting, and balancing poses. In the figure, one can observe that poses can be related to representation of quadratic polynomial.

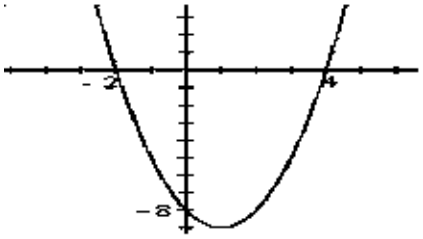


(i) The shape of the poses shown is

	A	Spiral	**B**	Ellipse	**C**	Linear	**D**	Parabola

(ii) The graph of parabola opens downwards, if

	A	$a \geq 0$	**B**	$a = 0$	**C**	$a < 0$	**D**	$a > 0$

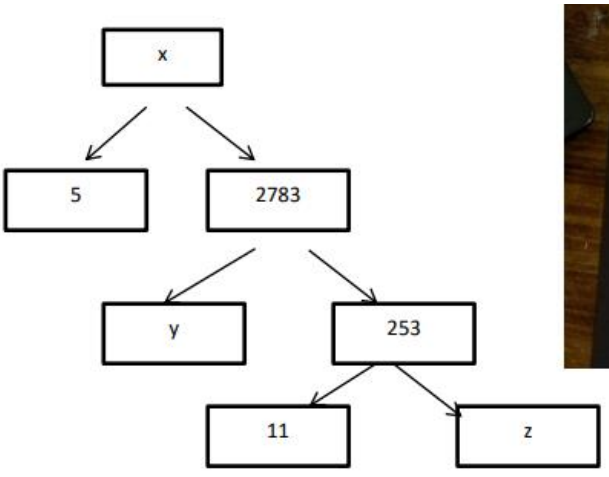
(iii)	In the graph, how many zeroes are there for the polynomial? 							
	A	0	**B**	1	**C**	2	**D**	3
(iv)	The two zeroes in the above shown graph are							
	A	2, 4	**B**	-2, 4	**C**	-8, 4	**D**	2, -8
(v)	The zeroes of the quadratic polynomial $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$ are							
	A	$\frac{2}{\sqrt{3}}, \frac{\sqrt{3}}{4}$	**B**	$-\frac{2}{\sqrt{3}}, \frac{\sqrt{3}}{4}$	**C**	$\frac{2}{\sqrt{3}}, -\frac{\sqrt{3}}{4}$	**D**	$-\frac{2}{\sqrt{3}}, -\frac{\sqrt{3}}{4}$
Q.38	**<u>Case study-based 2:</u>** **Auto and Taxi Fare** The state governments revise fares from time to time based on various factors such as inflation, fuel price, demand from various quarters etc. The government notifies different fares for different types of vehicles like Auto Rickshaws, Taxis, Radio Cab etc. The auto charge in a city comprise of a fixed charge together with the charge for the distance covered. Study the following situations: **<u>Situation-I</u>:** In a city A, for a journey of 10km, the charge paid is ₹ 75 and for a journey of 15km, the charge paid is ₹ 110. **<u>Situation-II</u>:** In a city B, for a journey of 8km, the charge paid is ₹ 91 and for a journey of 14km, the charge paid is ₹ 145.							
	Refer Situation-I							
(i)	If the fixed charges of auto rickshaw be ₹ x and the running charges be ₹ y per km, the pair of linear equations representing the situation is							
	A	x + 10y = 110 x + 15y = 75	**B**	x + 10y = 75 x + 15y = 110	**C**	10x + y = 110 15x + y = 75	**D**	10x + y = 75 15x + y = 110

(ii)	What will a person have to pay for travelling a distance of 25km?							
	A	₹ 160	**B**	₹ 280	**C**	₹ 180	**D**	₹ 260
(iii)	A person travels a distance of 50km. The amount he has to pay is							
	A	₹ 155	**B**	₹ 255	**C**	₹ 355	**D**	₹ 455
	Refer Situation-II							
(iv)	What will a person have to pay for travelling a distance of 30km?							
	A	₹ 185	**B**	₹ 289	**C**	₹ 275	**D**	₹ 305
(v)	The lines representing the equations are							
	A	parallel	**B**	coincident	**C**	intersecting	**D**	parallel or coincident

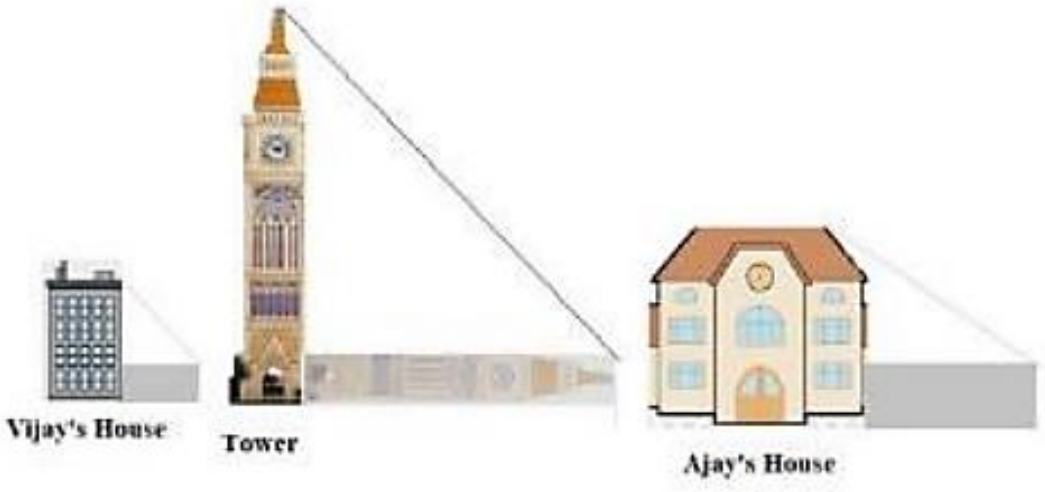
Q.39 **Case study-based 3:**

A Mathematics Exhibition is being conducted in your School and one of your friends is making a model of a factor tree. He has some difficulty and asks for your help in completing a quiz for the audience.

Observe the following factor tree and answer the following:



(i)	What will be the value of x?							
	A	15005	**B**	13915	**C**	56920	**D**	17429

(ii)	What will be the value of y?							
	A	23	**B**	22	**C**	11	**D**	19
(iii)	What will be the value of z?							
	A	22	**B**	23	**C**	17	**D**	19
(iv)	According to Fundamental Theorem of Arithmetic 13915 is a							
	A	Composite number	**B**	Prime number	**C**	Neither prime nor composite	**D**	Even number
(v)	The prime factorisation of 13915 is							
	A	$5 \times 11^3 \times 13^2$	**B**	$5 \times 11^3 \times 23^2$	**C**	$5 \times 11^2 \times 23$	**D**	$5 \times 11^2 \times 13^2$
Q.40	**<u>Case study-based 4:</u>** Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles. The height of Vijay's house is 20m when Vijay's house casts a shadow 10m long on the ground. At the same time, the tower casts a shadow 50m long on the ground and the house of Ajay casts 20m long shadow on the ground.  							
(i)	What is the height of the tower?							
	A	20 m	**B**	50 m	**C**	100 m	**D**	200 m

(ii)	What will be the length of the shadow of the tower when Vijay's house casts a shadow of 12m?							
	A	75 m	**B**	50 m	**C**	45 m	**D**	60 m
(iii)	What is the height of Ajay's house?							
	A	30 m	**B**	40 m	**C**	50 m	**D**	20 m
(iv)	When the tower casts a shadow of 40m, at the same time what will be the length of the shadow of Ajay's house?							
	A	16 m	**B**	32 m	**C**	20 m	**D**	8 m
(v)	When the tower casts a shadow of 40m, at the same time what will be the length of the shadow of Vijay's house?							
	A	15 m	**B**	32 m	**C**	16 m	**D**	8 m

Answers

Answers

Q.1	A	**Q.2**	B	**Q.3**	C	**Q.4**	A	**Q.5**	A			
Q.6	D	**Q.7**	C	**Q.8**	C	**Q.9**	B	**Q.10**	B			
Q.11	B	**Q.12**	D	**Q.13**	A	**Q.14**	B	**Q.15**	D			
Q.16	A	**Q.17**	B	**Q.18**	D	**Q.19**	B	**Q.20**	C			
Q.21	A	**Q.22**	D	**Q.23**	C	**Q.24**	A	**Q.25**	D			
Q.26	C	**Q.27**	A	**Q.28**	A	**Q.29**	C	**Q.30**	A			
Q.31	B	**Q.32**	D	**Q.33**	A	**Q.34**	A	**Q.35**	B	**Q.36**	C	
Q.37	(i) D (ii) C (iii) C (iv) B (v) B	**Q.38**	(i) B (ii) C (iii) C (iv) B (v) C	**Q.39**	(i) B (ii) C (iii) B (iv) A (v) C	**Q.40**	(i) C (ii) D (iii) B (iv) A (v) D					

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