APEEJAY COMMON PREBOARD EXAMINATION (2024-2025) SUBJECT - MATHEMATICS

CLASS - X

M.M. 80

DURATION:3 HOURS

General Instructions:

1. This Question Paper has 5 Sections A, B, C, D and E.

2. Section A has 20 MCQs carrying 1 mark each.

3. Section B has 5 questions carrying 02 marks each.

4. Section C has 6 questions carrying 03 marks each.

5. Section D has 4 questions carrying 05 marks each.

6. Section E has 3 Case based integrated units of assessment (04 marks each) with sub parts of value of 1, 1 and 2 marks each respectively.

7. All Questions are compulsory. However, an internal choice in 2 Questions of 2 marks, 2 Questions of 3 marks and 2 Questions of 5 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.

8. Draw neat figures wherever required, Take $\pi = \frac{22}{7}$ wherever required if not stated.

9. The question paper consists of 7 printed pages.

TOR.	SECTION A Section A consists of 20 questions of 1 mark each.	
0.10		Marks
<u>Q.NO.</u> 1	The value of k for which the pair of linear equations $x - 2y = 3$ and $3x + k y = 1$ has a unique solution is (a) $k = -6$ (b) $k \neq -6$ (c) $k = 0$ (d) $k \neq -\frac{3}{2}$	1
2	If one of the zeroes of the quadratic polynomial $p(x) = (k-1) x^2 + k x + 1 is - 3$, then the value of k is (a) $-\frac{4}{3}$ (b) $\frac{4}{3}$ (c) $-\frac{2}{3}$ (d) $\frac{2}{3}$	1
3	In the figure given below, if \triangle ABC circumscribes a circle, then length of BC is $ \begin{array}{c} $	1
	(a) 8 cm (b) 11 cm (c) 12 cm (d) 10 cm	
4	If \triangle ABC is right angled at C, then the value of cosec (A+B) is	1

1	(a) 0		(b) 1	(c) $\frac{1}{2}$	(d) $\frac{\sqrt{3}}{2}$	
5			e of a frequency ency distribution	n is	and 16 respectively. The	
	(a) 22		(b) 23.5	(c) 24	(d) 24.5	
6	point A to	o a circle w	elow, the pair o ith centre O are radius of the ci	perpendicular to er	AQ drawn from an external ach other and length of each	
	(a) 10 ci	m	(b) 7.5 cm	(c) 5 cm	(d) 2.5 cm	
7	A sphere o partly fille rises (in cn (a) 3	d with wate n) by	18 cm is droppe er. If the sphere b) 4	ed into a cylindrica is completely subs (0) 5	al vessel of diameter 36 cm, merged, then the water level (d) 6	
			in the second	A STATISTICS AND		1
	and the second se				a line seament toining the	
	points A (-2, (a) (0, 0)	, -5) and B (b)	(2,5) is) (0 , 2)	(c) (2 , 0)	e line segment joining the (d) (-2,0)	
	points A (-2, (a) (0, 0)	given belo	(2,5) is) (0 , 2)		(d) (-2 , 0)	
	points A (-2, (a) (0, 0) In the figure	given belo	(2,5) is) (0 , 2) ow, if AB QR,	(c) (2 , 0)	(d) (-2 , 0)	
1	points A (-2, (a) (0, 0) In the figure $\frac{1}{3 \text{ cm}}$ (a) 2cm (a) 2cm	(b) for thrown at t	(2,5) is) (0, 2) ow, if AB QR, 3cm the same time a	(c) (2, 0) then the length of (c) 6cm and the product of	(d) (-2,0) PB is (d) 9cm numbers appearing on them ber is	
Tis	points A (-2, (a) (0, 0) In the figure $\frac{1}{3 \text{ cm}}$ (a) 2cm (a) 2cm	(b) for thrown at t	(2,5) is) (0, 2) ow, if AB QR, 3cm the same time a	(c) (2 , 0) then the length of (c) 6cm	(d) (-2,0) PB is (d) 9cm 'numbers appearing on them	
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3	If the distance	hat	and and the				C - in		1	
	If the distance (a) 4	between t	ne pointe (1	5 the	in the value	of p is			
_		(b) ± 4	1-100 (1	4, p) and (1	,0) is 5, une	(d)	0			
4	If $v = 1$ is a		The second	(c)	-4			- h	1	
	If $y = 1$ is a common root of the equations $ay^{2+}ay + 3 = 0$ and $y^{2+}y + b = 0$, then ab (a) 3									
	())		or the equ	uations ay ²	$^{2}+ay+3=$	0 and 7				
	(a) 3	(b) 6				(4)	$\frac{-7}{2}$			
	and all the state	(0)0		(c) -	- 3	(u)	2			
15	The probability of getting a bad egg in a lot of 400 is 0.035. The number of bad eggs									
	in the lot is	by of gettin	g a bad eg	g in a lot of	400 is 0.03	35. The num	iber of bau	10860		
	(a) 7	1.		0 - 4 101 01	400					
1	A Starting the	(b) 14		(c) 2	21	(d)	28	and the		
16	$lf\frac{1}{x+2},\frac{1}{x+3},\frac{1}{5}$	1		(0).					1	
	x+2' x+3'	are in A	.P, then th	e value of	in					
		5 6 M.S.	-112 1.300	· value of y	(15					
	(a) 5	(b) 3				(d) 2				
17				(c)	1		and the second			
17	Consider the	following o	lata:			315	1500	1.1.1	1	
	Class	65-85	85-105	105 105	1.05 1.45	145-165	165-185	1		
	Frequency	4	5	105-125	125-145	143-103	7			
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	The difference	e of the up	ner limit a	£11	42	the Louran li	mit of the	modal		
	class is	e er de up	per minit o	i the media	n class and	the lower in	mit of the	modal		
	Destablished Art -									
	(a) 0	(h) 19				(1)	20			
	(a) 0	(b) 19		(c) 2	0	(d)	38	Santa M		
18			is equal to		0	(d)	38	nandar/3	-	
18	(a) 0 (sec ² θ - 1) (1 (a) -1	- cosec ² θ)	is equal to		100			Carlos de	1	
	$(\sec^2\theta - 1)(1)$ (a) -1	- cosec ² θ) (b) 1		; (c) 0	-	(d)	2	saylor/A	1	
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	SECTION B	
	Section B consists of 5 questions of 2 marks each.	-
21	 (a) Find the least positive integer divisible by first five natural numbers. OR (b) The H.C.F of 85 and 238 is expressible in the form 85m -238. Find the value of m. 	2
22	A (5,1), B (1,5) and C (-3, -1) are the vertices of $\triangle ABC$. Find the length of the median AD.	2
23	The centre of a circle is (2a-1,7) and it passes through the point (-3, -1). If the diameter of the circle is 20 units, then find the value of a.	2
24	 (a) Cards numbered 1 to 30 are put in a bag. A card is drawn at random from this bag. Find the probability that the number on the card drawn from bag is (i) not divisible by 3. (ii) a prime number greater than 7. (b) A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball from the bag is thrice that of a red ball, find the number of blue balls in the bag. 	2
25	Evaluate the following $\frac{4 \cot^2 60^\circ + \sec^2 30^\circ - 2\sin^2 45^\circ}{\sin^2 60^\circ + \cos^2 45^\circ}$	2
	SECTION C Section C consists of 6 questions of 3 marks each.	
26	(a) Sides AB and BC and median AD of a triangle ABC are respectively proportional to sides PQ and QR and median PM of triangle PQR. Show that $\triangle ABC \sim \triangle PQR$. $\begin{array}{c} & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ &$	3
	OR (b) A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.	
27	The altitude of a right triangle is 7cm less than its base. If the hypotenuse is 13cm, find the other two sides.	3

=8.	Prove th									3
⊇9.)	If the ze			tan A	+ sec A	$\frac{-1}{-1} = \frac{1}{2}$	+ sinA			
	polynon	roes of the main $2x^2$.	the polynomial $-5x - 3$,	mial x ² then fin	$2^{2} + px + q$	are double tes of p and	in value to	the zeroe	s of the	3
30.		the area			rait	and the len	gth of the c			3
	(b) An an cm ² . Find	rc of a cir d the radi	us of the	circle.		the area of	R the corresp			
								A REAL PROPERTY AND A REAL PROPERTY.	the second s	
31.	Prove that	at 5 – 2√3	is an irra	ational	number g	iven that √	3 is an irrat	ional numl	ber.	3
31.	Prove that	P	-	2 por	SECT	ON D	ti ati ne a	a dina	ber.	3
31.	 (a) Draw vertices o triangle. (b) Seven 	S the graph f the trian times a t	ection D h of the p ngle form wo-digit	consist air of li ed by t	SECTI ts of 4 qu inear equa hese lines OF r is equal	ON D estions of ations 2x + and the y- to four time	3 is an irrat 5 marks ea - $y = 4$ and -axis. Also less the num- een the digi	the find the area obtain	Write the ea of this ed by	3
32	 (a) Draw vertices o triangle. (b) Seven reversing number. (a) The dis 	S the graph f the trian times a t the order stribution	ection D h of the p ngle form wo-digit of the dig	consist air of li ed by t number gits. If	SECTI ts of 4 qui inear equi hese lines OF r is equal the difference e marks of	ON D estions of ations 2x + and the y- and the y- to four timence betwee	5 marks each $y = 4$ and $-axis$. Also	ach. 2x - y = 4. find the area aber obtain its is 3, find	Write the ea of this ed by d the	
32	 (a) Draw vertices o triangle. (b) Seven reversing number. (a) The dia marks are Marks No. of 	S the graph f the trian times a t the order stribution	ection D h of the p ngle form wo-digit of the dig	consist air of li ed by t number gits. If	SECTI ts of 4 qui inear equi hese lines OI r is equal the difference e marks of o and q.	ON D estions of ations 2x + and the y- and the y- to four timence betwee f 100 stude	5 marks ea - $y = 4$ and -axis. Also the sthe number the digi	ach. 2x - y = 4. find the area aber obtain its is 3, find	Write the ea of this ed by d the	5
32	 (a) Draw vertices o triangle. (b) Seven reversing number. (a) The dia marks are Marks 	S the graph f the trian times a t the order stribution 24, find t 0-5 4	ection D h of the p ngle form wo-digit of the dig below gi the freque 5-10 6	consist air of li ed by t number gits. If ives the encies p 10-15	SECTI ts of 4 qui inear equi hese lines OH r is equal the difference e marks of o and q. 5 15-20 p OR	CON D estions of ations $2x + 3$ and the y- to four time ence betwee f 100 stude 0 20-25 25	5 marks ea y = 4 and axis. Also the number of the diginal ents of a classical 25-30 q	ach. 2x - y = 4. find the area aber obtain its is 3, find ass. If the r 30-35 18	Write the ea of this ed by d the median 35-40	5
	 (a) Draw vertices o triangle. (b) Seven reversing number. (a) The dia marks are Marks No. of students 	S the graph f the trian times a t the order stribution 24, find t 0-5 4	ection D h of the p ngle form wo-digit i of the dij below gi the freque 5-10 6	consist air of li ed by t number gits. If ives the encies p 10-15 10	SECTI ts of 4 qui inear equi hese lines OH r is equal the difference e marks of o and q. 5 15-20 p OR	CON D estions of ations $2x + 3$ and the y- to four time ence betwee f 100 stude 0 20-25 25	5 marks ea y = 4 and axis. Also the number of the diginal ents of a classical 25-30 q	ach. 2x - y = 4. find the area aber obtain its is 3, find ass. If the r 30-35 18	Write the ea of this ed by d the median 35-40	5

34)	A bird is sitting on the top of a 80 m high tree. From a point on the ground, the angle of elevation of the bird is 45°. The bird flies away horizontally in such a way that it remained at a constant height from the ground. After 2 seconds, the angle of elevation of the bird from the same point is 30°. Find the speed of flying of the bird.	5
35.	(i) Prove that lengths of tangents drawn from an external point to a circle are equal. (ii) In the figure, two tangents RQ and RP are drawn from an external point R to the circle with centre O. If $\angle PRQ = 120^\circ$, then prove that OR =2 PR	2+3
1-	SECTION E Section E consists of 3 Case Based study questions of 4 marks each. /ijay is trying to find the average height of a tower near his house. He is using the roperties of similar triangles. The height of Vijay's house is 20m and it casts a	
sh	adow 10m long on the ground at a particular time. At the same time, the tower casts shadow 50m long on the ground and the house of Ajay casts 20m shadow on the bound.	
	VIJAY"HOUSE TONER	
B	 (i) What is the height of the tower? (ii) What is the height of Ajay's house? (iii) If the tower casts a shadow of 40m at a particular time, then what will be the length of the shadow of Ajay's house at that time? 	1 1
	OR When the tower casts a shadow of 40m, same time what will be the length of the shadow of Vijay's house?	2

m

6

7.	 Manpreet Kaur is the national record holder for women in the short put discipline. Her throw of 18.86 m at the Asian Grand Prix in 2017 is the biggest distance for an Indian female athlete. Keeping her as a role model, Sanjhitha is determined to earn gold in Olympics one day. Initially her throw reached 7.56 m only. Being an athlete in school, she regularly practiced both in the mornings and in the evenings and was able to improve the distance by 9 cm every week. During the special camp for 15 days, she started with 40 throws and every day kept increasing the number of throws by 12 to achieve this Based on the above information, answer the following questions: (i) How many throws did she do during the entire camp of 15 days? (ii) How many throws did she do during the entire camp of 15 days? (iii) What would be Sanjitha's throw distance at the end of 6 months? 	1 1 2
38.	For a school Trophy: A school decides to give a trophy of the best student in the class, which is the form of cylinder mounted on a solid hemisphere with the same radius and is made from some metal. Suppose the diameter of the hemisphere is 24 cm and total height of trophy is 28cm. (i) Find the curve surface area of the cylinder. (ii) Find the volume of the cylinder. (iii) Find the volume of the cylinder. (iii) Find the curved surface area of the trophy. OR Find the weight of the metal used in making the trophy, if the weight of 1cm ³ of metal is 1.5gm.	1 1 2