## Class - X

## Mathematics-Basic (241)

## Marking Scheme-SQP 2019-20

Max. Marks: 80 Duration: 3 hrs.

1.	(b) 42	(1)
2.	(a)2 Mean = 3 Median - Mode	(1)
3.	(d)70°	(1)
4.	(b) 5 <sup>2</sup> ×13	(1)
5.	$(a)\frac{1}{26}$	(1)
6.	(d) 4	(1)
7.	(c) 5.010010001	(1)
8.	(c) 3	(1)
9.	(b) 5 units	(1)
		(1)
10.	(b) (- 3, 5)	(1)
11.	(2, 3)	(1)
12.	2 <b>OR</b> 1	(1)
13.	1	(1)
14.	0	(1)
15.	4:9	(1)
16.	$Sin P = 1/\sqrt{2}$	(1)

	OR	
	cosec A = 17/15	
17.	Area of quadrant = $\frac{1}{4} \times \frac{22}{7} \times r^2 = 38.5$ (use $\pi = \frac{22}{7}$ )	$(\frac{1}{2})$
	$\Rightarrow$ r = 7cm	
	∴ diameter = 14 cm	$\left(\frac{1}{2}\right)$
	1	
18.	$\frac{1}{2}$	1
19.	$\frac{AD}{BD} = \frac{AE}{EC}$ (By B.P.T.)	$(\frac{1}{2})$
	$\frac{1.5}{3} = \frac{1}{EC}$	
	$3   EC$ $\therefore EC = 2 cm$	$(\frac{1}{2})$
		.1.
20.	$A_5 = a_1 + 4d = 0$ $1^2 + 4d = 0$	$\left(\frac{1}{2}\right)$
	d = -3	$(\frac{1}{2})$
	SECTION - B	
21.	1	(1)
	P (Two Head) = $\frac{1}{4}$	(1)
22.	Good bulbs = 25 - 5 = 20	(1)
22.	P (good bulb) = $\frac{20}{25} = \frac{4}{5}$	(1)
	OR	
	Of all those outcomes, the ones for which $a + b = 8$ are: $2+6$ , $3+5$ , $4+4$ , $5+3$ , $6+2$ or 5 outcomes.	(1)
	P = 5/36	(1)

23.	A L B  C M D $\angle OLA = 90^{\circ}$ $\angle OMD = 90^{\circ}$ $\angle OLA = \angle OMD$ Which are alternate angles, hence AB    CD	(1)		
		(1)		
24.	LHS = tan 48° tan 23°tan 42°tan 67°	(1)		
	=Cot (90°-48°) cot (90°-23°) tan 42° tan 67°			
	=Cot 42° cot 67° tan 42° tan 67°	(1)		
	=1			
	OR			
	=Cos 48°cos 42° - Sin 48° Sin 42°	(1)		
	=Sin (90° - 48°) sin (90°-42°) - Sin 48° Sin 42°	(1)		
	=Sin 42° Sin 48° - Sin 48° Sin 42° = 0	(1)		
25.	$r = \frac{7}{2}$	(1)		
	Area of Circle= $\frac{\pi r^2}{4} = \frac{77}{2} \text{cm}^2$			
		(1)		
2/	(i) 2 Students			
26.	(i) 3 Students			
	w <sup>2</sup> + 2 w + 4	(1)		
	(ii) $\frac{x^2 + 2x + 1}{x + 1}$	(')		
	~ 1 I	(1)		
	$= \frac{(x+1)^2}{x+1} = x+1$			
SECTION - C				

27.	$x^2-3x-10 = 0$	(3)				
	$x^2-5x+2x-10 = 0$					
	x(x-5) + 2(x-5)=0					
	(x-5) $(x+2)=0$					
	X = 5, -2					
	Sum of the roots = $\frac{-b}{a} = \frac{3}{1}$					
	which is same as 5 - 2 = 3					
	product of the roots = $\frac{c}{a}$ -10					
	which is same as $5x(-2) = -10$					
	Hence verified					
28.	Correct construction of given circle	(1)				
	Correct construction of two tangents	(2)				
	OR	(1)				
	Line of given length					
	Correct position of point which divides the line segment in the given					
	ratio					
20	Anna of track - 120 y 70 t E (25) <sup>2</sup> E120 y EC t E (29) <sup>2</sup> 1	(1)				
29.	Area of track = $120 \times 70 + \square (35)^2 - [120 \times 56 + \square (28)^2]$	(1)				
	$= 120 \times 14 + \frac{22}{7} [(35)^2 - (28)^2]$					
	$= 1680 + \frac{22}{7} \times 7 \times 63$					
	= 1680 + 1386	$\left(1\frac{1}{2}\right)$				
	$= 3066 \text{m}^2$					
	Vos Moona is wrong	$(\frac{1}{2})$				
30.	Yes, Meena is wrong.					
30.	L.H.S. = $\frac{\cot A - \cos A}{\cot A + \cos A} = \frac{\frac{\cos A}{\sin A} - \cos A}{\frac{\cos A}{\sin A} + \cos A}$	(1)				
	$= \frac{\cos A \left(\frac{1}{\sin A} - 1\right)}{\cos A \left(\frac{1}{\sin A} + 1\right)} = \frac{\left(\frac{1}{\sin A} - 1\right)}{\frac{1}{\sin A} + 1}$					
	$=\frac{1}{\cos A\left(\frac{1}{\sin A}+1\right)}=\frac{1}{\sin A}+1$					
	$= \frac{\operatorname{cosec} A - 1}{\operatorname{cosec} A + 1} = R.H.S$	(1)				

	OR	
	$L.H.S. = \frac{\tan A + \sin A}{\tan A - \sin A}$	(1)
	$= \frac{\frac{Sin A}{Cos A} + Sin A}{\frac{Sin A}{Cos A} - cos A} = \frac{Sin A}{Sin A} \frac{[Sec A+1]}{[Sec A-1]}$ $= R.H.S$	$(\frac{1}{2})$ $(\frac{1}{2})$ (1)
		(1)
31.	Let us assume that $5 - \sqrt{3}$ is a rational  We can find co prime a & b ( b $\neq$ 0 )such that	$(\frac{1}{2})$
	$5 - \sqrt{3} = \frac{a}{b}$ Therefore $5 - \frac{a}{b} = \sqrt{3}$ So we get $\frac{5b-a}{b} = \sqrt{3}$ Since a & b are integers, we get $\frac{5b-a}{b}$ is rational, and so $\sqrt{3}$ is rational. But $\sqrt{3}$ is an irrational number	(1) $(\frac{1}{2})$
	Which contradicts our statement	(1)
	616 = 32 x 19+8 $\Rightarrow r = 8 \neq 0$ 32 = 8 x 4+0 $\Rightarrow r = 0$ The HCF of 32 and 616 is 8.	(2)
32.		(1)

	P $A$ $B$ $B$	(1)
33.	In $\triangle OPA$ and $\triangle OPB$ $\angle PAO = \angle PBO$ (each 90°) $OP = OP(common)$ $OA = OB(radii\ of\ same\ circle\ )$ $\triangle OPA \cong \triangle OPB\ (by\ RHS\ congruency\ axiom$ Hence $PA = PB\ (CPCT)$ (i) $(6,4)$ (ii) $\sqrt{(6-3)^2 + (1-4)^2} = 3\sqrt{2}$ units	(1) (1) (1)
	(iii) Sita and Rita	
34.	2x + 3y = 11(1) x-2y = -12(2) $(2) \Rightarrow x = 2y-12$ (3) Substitute value of x from (3) in (1), we get 2(2y-12) + 3y = 11 $\Rightarrow 4y - 24 + 3y = 11$ $\Rightarrow 7y = 35$ $\Rightarrow y = 5$ Substituting value of $y = 5$ in equation (3), we get x = 2(5) - 12 = 10 - 12 = -2 Hence $x = -2$ , $y = 5$ is the required solution Now $5 = -2m + 3$ $\Rightarrow 2m = 3-5$ $\Rightarrow 2m = -2$ m = -1	(1)
		(1)
		(1)
	SECTION - D	
35.	Let two consecutive positive integers be $x$ and $x + 1$	$(\frac{1}{2})$
		4

	$\therefore x^2 + (x+1)^2 = 365$	$(1\frac{1}{2})$
	$\Rightarrow x^2 + x - 182 = 0$	(1)
	(x+14)(x-13) = 0 $\therefore x = 13$	
	$\therefore x = 13$ Hence two consecutive positive integers are 13 and 14	
	Theree two consecutive positive integers are 13 and 14	(1)
36.	Let common difference be $d$	
	$\Rightarrow \frac{14}{2}[2(10) + (n-1)d] = 1050$	
	⇒d = 10	(0)
	$a_{20} = a + 19 d$	(2)
	= 10 + 19 (10) = 200	(2)
		(2)
	OR	
	a=5	
	$\mathbf{a_n} = 45$	
	$S_n = 400$	
	$\Rightarrow \frac{n}{2} (5+45) = 400$ $50n = 800$	
	n = 16	(2)
	also $a_n = 45$	
	5+15d = 45	
	15d=40	
	d=8/3	(2)

37.	PA 30 45° A 75	
	B 2 C D	(1)
	For correct fig $In\Delta ADC$ , $tan 45^o = \frac{75}{CD}$ $1 = \frac{75}{CD} \Rightarrow CD = 75$ $In \Delta ADB$ , $tan 30^o = \frac{75}{BD}$	(1)
	$\frac{1}{\sqrt{3}} = \frac{75}{BD}$ ⇒ BD = $75\sqrt{3}$ ⇒Distance between two ships = BC= $75(\sqrt{3} - 1)$ m = $54.9$ m	(1)
20	For correct Civen. To prove construction and Figure	. 1
38.	For correct, Given, To prove, construction and Figure  For correct proof	$(4 \times \frac{1}{2})$ $= 2)$ $(2)$
	OR	$(5 \times \frac{1}{2})$ $= 2\frac{1}{2}$
	For correct statement, Given, To prove, Construction and Figure	_ 2′

				$(1\frac{1}{2})$			
	For correct proof						
39.	A.T. Q.			(2)			
	$\pi r^2 \times 1800 = \pi \times \frac{1}{2} \times \frac{1}{2}$	$\frac{1}{2} \times 8$					
	$\Rightarrow r^2 = \frac{1}{900}$						
	$\Rightarrow r = \frac{1}{30}$						
	$\therefore \text{ Thickness of wire } = \frac{1}{15}cm$						
	OR						
	$\frac{4}{3}\pi r^3 = \pi R^2 h$ $\frac{4}{3}(4.2)^3 = (6)^2 h$						
	$\frac{4}{3}(4.2)^3 = (6)^2 h$						
	$\Rightarrow h = \frac{2744}{100}$						
		$\therefore h = 2 \cdot 744  cm$		$(1\frac{1}{2})$ $(\frac{1}{2})$			
	$\dots n = 2 \cdot 144  \text{cm}$						
40							
40.	Daily Number of workers Cumulative						
	Income		Frequency				
	400-420	12	12				
	420-440	14	26				
	440-460	8	34				

	460-480	6	40		
	480-500	10	50		
					(2)
Correct Table					
Drawing an ogive with co-ordinates					(2)
(420,12), (440,26), (460,34), (480,40), (500,50)					