

Physics Master Academy Only Teaching Noting Else.
Marking Scheme

Class- X Session- 2021-22

TERM 1

Subject- Mathematics (Basic)

Q. N.	CORRECT OPTION	HINTS/SOLUTION
1	(d)	$P(\text{perfect Square}) = 5/45 = 1/9$
2	(c)	length of the arc = $\theta / 360^\circ (2\pi r) = (60^\circ / 360^\circ) \times 2 \times (22/7) \times 21 = 22\text{cm}$
3	(a)	$\tan \theta = \sin \theta / \cos \theta = \sin \theta \times \sec \theta = xy$
4	(d)	The lines are parallel hence No solution
5	(b)	$P(\text{even composite no}) = 2/6 = 1/3$
6	(a)	Let the cost of one chair = Rs. x Let the cost of one table = Rs. y $8x + 5y = 10500$ $5x + 3y = 6450$ Solving the above equations Cost of each chair = x = Rs. 750
7	(c)	$\cos \theta = 1 - \cos^2 \theta = \sin^2 \theta$ Therefore $\sin^2 \theta + \sin^4 \theta = \cos \theta + \cos^2 \theta = 1$
8	(a)	Terminating
9	(c)	$2^3 \times 3^3$
10	(c)	$1^{\text{st}} \text{ No.} \times 2^{\text{nd}} \text{ No.} = \text{HCF} \times \text{LCM}$ $12960 = 18 \times \text{LCM}$ $\text{LCM} = 720$
11	(c)	$AE/AC = DE/BC = a/a+b = x/y$ $X = ay/(a+b)$
12	(d)	$(2 \times 4 + 1 \times 1)/3, (2 \times 6 + 1 \times 3)/3$ $= (3, 5)$
13	(c)	$3825 = 3^2 \times 5^2 \times 17$
14	(d)	$AB^2 = AD^2 + BD^2$ $AB = 5\text{cm}$ $AC^2 = AB^2 + CB^2$ $AC = 13\text{ cm}$ $\cot \theta = CB/AB = 12/5$
15	(a)	$x + y = 12$ $x - y = 8$ Solving the above equations $x = 10, y = 2$
16	(d)	$AB^2 = AC^2 + AC^2$ $= AC^2 + BC^2$ Hence, angle C = 90°
17	(d)	Let the zeroes be a and b Then, $a = -1, a + b = -(-7)/1$ Hence, $b = 7 + 1 = 8$
18	(a)	$P(\text{same no on each die}) = 6/36 = 1/6$
19	(b)	$(2, 6) = ((3p-2)/2, (4+2q)/2)$ $3p-2=4, 4+2q=12$ $p=2, q=4$ hence $p+q = 6$
20	(c)	$147/120 = 49/40 = 49/2^3 \times 5$

		Three decimal places
21	(d)	Perimeter of protractor=Circumference of semi-circle + 2 x radius $=\pi r+2r$
22	(c)	$0 \leq P(E) \leq 1$
23	(b)	$CD/BD=BD/AD$ $BD^2=CD \times AD=6 \times 3$ $BD=3\sqrt{2}$ cm
24	(b)	$3/6=5/k \Rightarrow k=10$
25	(d)	$C1/C2=2\pi r/2\pi R$ $2\pi/4\pi=2\pi r/2\pi R$ $r/R=1/2$ $A1/A2=\pi r^2/\pi R^2=(r/R)^2=(1/2)^2=1/4$ $A2=4A1$
26	(d)	$\sin\theta=a/b$ $H^2=P^2+B^2$ $b^2=a^2+B^2$ $B=\sqrt{(b^2-a^2)}$ $\tan\theta=P/B=a/\sqrt{(b^2-a^2)}$
27	(a)	$x+y=2\sin^2\theta+2\cos^2\theta+1$ $=2(\sin^2\theta+\cos^2\theta)+1$ $=2+1=3$
28	(b)	$2\pi r-r=37$ $r\{2\pi(22/7)-1\}=37$ $r=37 \times 7/37$ $r=7$ circumference= $2\pi r=2 \times (22/7) \times 7=44$ cm
29	(c)	1 = 1 2 = 2 × 1 3 = 3 × 1 4 = 2 × 2 5 = 5 × 1 6 = 2 × 3 7 = 7 × 1 8 = 2 × 2 × 2 9 = 3 × 3 10 = 2 × 5 So, LCM of these numbers = 1 × 2 × 2 × 2 × 3 × 3 × 5 × 7 = 2520 Hence, least number divisible by all the numbers from 1 to 10 is 2520
30	(c)	LCM of 4,7,14=28 Bells will they ring together again at 6:28 AM
31	(b)	Let age of Father=x Years Let age of son = y years $x+y=65$ $2(x-y)=50$ Solving the above equations Father's Age =x = 45 years
32	(c)	$(\tan\theta \operatorname{cosec}\theta)^2-(\sin\theta \sec\theta)^2$ $=\tan^2\theta \operatorname{cosec}^2\theta-\sin^2\theta \sec^2\theta$ $=(\sin^2\theta/\cos^2\theta) \times 1/\sin^2\theta - \sin^2\theta \times 1/\cos^2\theta$ $=(1-\sin^2\theta)/\cos^2\theta= \cos^2\theta/\cos^2\theta =1$
33	(d)	$A1/A2=(P1/P2)^2=(26/39)^2$

		$A1/A2=(2/3)^2=4/9$
34	(a)	Let no of Cars=x Let no of motorcycles=y $x+y=20$ $4x+2y=56$ Solving the above equations No of cars=$x=8$
35	(c)	$H^2=P^2+B^2$ $H^2=15^2+8^2$ $H=17m$
36	(c)	$(\text{altitude})^2=(\text{side})^2-(\text{side}/2)^2$ $=8^2-4^2=64-16=48$ Altitude= $4\sqrt{3}$ cm
37	(d)	$P=3/9=1/3$
38	(b)	$\Theta/360^\circ \times \pi r^2 = 1/6 \times \pi r^2$ $\Theta=60^\circ$
39	(d)	Height of Vertical stick/Shadow of vertical stick=height of tower/shadow of tower $20/10=\text{Height of tower}/50$ Height of tower= 100 m
40	(d)	$37x+43y=123$ _____(1) $43x+37y=117$ _____(2) Adding (1) and (2) $x+y=3$ _____(3) Subtracting (2) from (1) $-x+y=1$(4) Adding (3) and (4), $2y=4$ $y=2$ $\Rightarrow x=1$ $\therefore$ solution is $x=1$ and $y=2$
41	(b)	$AB=\sqrt{\{(4-1)^2+(0-4)^2\}}$ $=\sqrt{3^2+4^2}$ $AB=5$ units
42	(a)	$(x-7)^2+(y-1)^2=(x-3)^2+(y-5)^2$ $x^2+49-14x+y^2+1-2y=x^2+9-6x+y^2+25-10y$ Simplifying $x-y=2$
43	(a)	$3x + y - 9 = 0$ Let R divide the line in ratio $k:1$ $R(\frac{2k+1}{k+1}, \frac{7k+3}{k+1})$ $3(\frac{2k+1}{k+1})+(\frac{7k+3}{k+1})-9=0$ $4k-3=0$ $K=3/4$ $3 : 4$
44	(c)	Distance of M from X-axis= $\sqrt{(2-2)^2+(0-3)^2}=\sqrt{9}=3$ units
45	(b)	$((1+3)/2, (4+5)/2) = (4/2, 9/2) = (2, 9/2)$
46	(c)	Cubic
47	(d)	Four Zeroes as the curve intersects the x-axis at 4 points
48	(d)	$p \neq 0$
49	(d)	3 Zeroes as the curve intersects the x-axis at 3 points
50	(c)	$-3, -1, 2$