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SESSION ENDING EXAM (2023-24)
CLASS: XI
SUBJECT: MATHEMATICS
MARKING SCHEME

SECTION-A

1	2	3	4	5	6	7	8	9	10
C	B	A	B	A	D	D	B	B	A
11	12	13	14	15	16	17	18	19	20
D	C	B	A	B	B	C	C	A	D

SECTION-B

21	Forming correct relation between a and b a=2 b=-1	0.5 1 0.5
22	For each correct answer	0.5
23	tan5x=tan(3x+2x) $tan\ 5x = \frac{tan\ 3x + tan\ 2x}{1 - tan\ 3x.tan\ 2x}$ Cross multiplication and correct proof	0.5 0.5 1
24	Taking 4I's as one object and ways to arrange them=1 Total number of object taking 4I's as single object=8 in which 4S and 2P Number of distinct permutations=$\frac{8!}{4!2!}$ =840 OR Total number of vowels and consonant =5 , 4 Number of ways to select 2 vowels and 3 consonant=C(5,2)xC(4,3) Total number of required words= C(5,2)xC(4,3)x5! =4800	0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5
25	$\lim_{x\to 0} \frac{1 - cos\ x}{sin\ x}$ $\lim_{x\to 0} \frac{sin\ x}{1 + cos\ x}$ 0	0.5 1 0.5

SECTION-C

26	1-x>0 i.e. x<1 Domain=(-∞,1) Let y=f(x) and getting 1-x=$\frac{1}{y^2}$ Range=(0, ∞) OR	0.5 0.5 1 1

	2x-5≠0 **x≠5/2** **Domain=R-{5/2}** **Let y=f(x) and getting x=$\frac{5y-2}{2y-3}$** **Range=R-{3/2}**	 **0.5** **0.5** **1** **1**
27	$\frac{(1+2i)(1+i)}{2}$ $\frac{-1-3i}{2}$ $x=-\frac{1}{2}, y=-\frac{3}{2}$ **x+y=-2**	**0.5** **1** **1** **0.5**
28	$x+x+3+2x \leq 111$ $x \leq 27$ $2x \geq x+3+5$ $x \geq 8$ **Length of shortest piece 8 to 27**	**1** **0.5** **0.5** **0.5** **0.5**
29	$6^n=(1+5)^n$ **For correct binomial expansion** **Expressing $6^n-5n-1=25\alpha$ for some natural value of α** **OR** $C(5,0)(x^2)^5+C(5,1)(x^2)^4(\frac{3}{x})^1+C(5,2)(x^2)^3(\frac{3}{x})^2+C(5,3)(x^2)^2(\frac{3}{x})^3$ $+C(5,4)(x^2)^1(\frac{3}{x})^4+C(5,5)(\frac{3}{x})^5$ $x^{10}+15x^7+90x^4+270x+\frac{405}{x^2}+\frac{243}{x^5}$	**0.5** **1.5** **1** **1.5** **1.5**
30	**6h+4k=11** **h-3k=11** **h=7/2, k=-5/2** **r^2=65/2** **$x^2+y^2-7x+5y-14=0$** **OR** **For correct figure** **For correct equation of parabola** **4a=125/3** **For correct length =43.1**	**1.5** **0.5** **1** **1** **1** **0.5** **1** **0.5** **1**
31	**For applying correct distance formula** **Transferring one square root term and correct squaring** **$4x^2+3y^2+4z^2=300$**	**1** **1** **1**

SECTION-D

32	**Correct expression in terms of cos 2x** $\frac{3}{2} - [cos\ 2x + cos\left(2x + \frac{2\pi}{3}\right) + cos(2x - \frac{2\pi}{3})]$ $\frac{3}{2} - [cos\ 2x + 2cos2x\ cos\frac{2\pi}{3})]$ $\frac{3}{2} - [cos\ 2x - cos2x\ ]$ **3/2**	**1** **1** **1** **1** **1**
33	$$a + b = 10\sqrt{ab}$$ $$\frac{(\sqrt{a} + \sqrt{b})^2}{(\sqrt{a} - \sqrt{b})^2} = \frac{3}{2}$$ $$\frac{\sqrt{a} + \sqrt{b}}{\sqrt{a} - \sqrt{b}} = \frac{\sqrt{3}}{\sqrt{2}}$$ $$\frac{\sqrt{a}}{\sqrt{b}} = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$$ **Squaring and for correct proof** **OR** **a+b=3, ab=p** **c+d=12,cd=q** **correct common ratio=2** **for correct proof**	**0.5** **1.5** **1** **1** **1** **0.5** **0.5** **2** **2**
34	**(a)**$\lim_{x\to 0}\frac{(2sin\ 3xcos\ 2x+2sin3x)}{x}$ $\lim_{x\to 0}\frac{2sin\ 3x(cos\ 2x + 1)}{x}$ **12** **(b)For correct application of quotient rule** **For correct answer** **OR** **For correct formula of first principle** $$\frac{d}{dx}f(x) = \lim_{x\to 0}\frac{\sqrt{sin(3x + 3h)} - \sqrt{sin3x}}{h}$$ $=\lim_{x\to 0}\frac{sin(3x+3h)-sin3x}{h.2\sqrt{sin3x}}$ $=\lim_{x\to 0}\frac{2cos\left(3x+\frac{3h}{2}\right)sin\frac{3h}{2}}{h.2\sqrt{sin3x}}$ $=\frac{3}{2}\frac{cos\ 3x}{\sqrt{sin\ 3x}}$	**1** **1** **1** **1** **1** **1** **1** **1** **1** **1**
35	**For correct formation of table** **Mean=107** **Variance=2276** **SD=47.71**	**1.5** **1** **2** **0.5**

SECTION-E

36	**(a)-1/2** **(b)x-2y+4=0** **(c)(4,4)**	**1** **2** **1**
37	**(a)C(8,3)xC(6,2)** **840** **(b)C(8,4)xC(6,1)** **420** **Or** **C(8,5)** **56**	**1** **1** **1** **1** **1** **1**
38	**21/25** **4/25** **3/25**	**1** **2** **1**