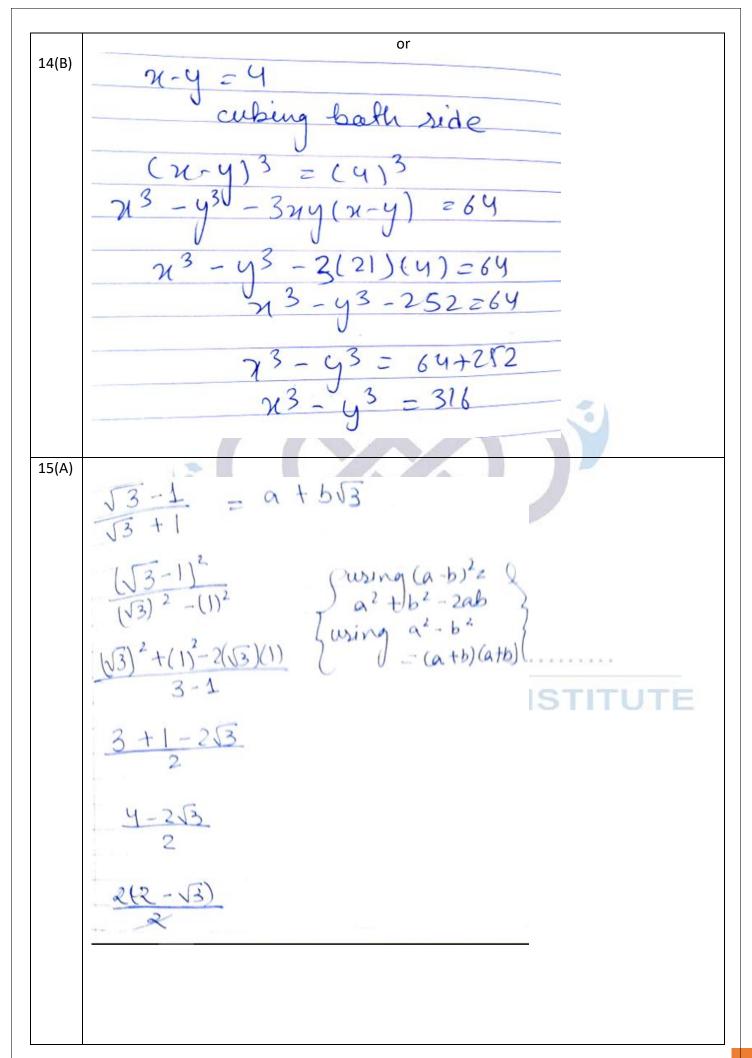
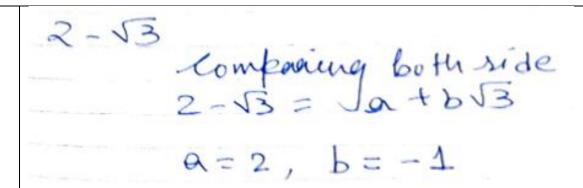
ANSWER KEY

1	(c) $3 + \sqrt{5}$
2	(d) $\frac{\sqrt{a}+b}{\sqrt{a}+b}$
3	(b) 0
4	(b) 4
5	(c) 5^{10}
6	(c) $\frac{1}{3}$
7	(c)2
8	(d) $3x^2 + 7$
9	(c)120
10	(d) $\sqrt{2}$
11	
	$3\sqrt{(343)^{-2}}$ $(7)^{-2}$
	1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 =
12(A)	$8ly^2 - K = \left(9y + \frac{1}{2}\right)\left(9y - \frac{1}{2}\right)$
	$81y^2 - K = (9y)^2 - (\frac{1}{2})^2$ INSTITUTE
	$81y^2 - K = 81y^2 - \frac{1}{y}$
	Compare
	$TK = \frac{+1}{4}$
	$K = \frac{1}{4}$
	4

	or
12(B)	P+1=0, P=-1
	9(p) = p50-1
	g(-1) = (-1)5° -1
	2(-1) = 0
	-: p+1 is a factor of p50-1
	$q(p) = p^{51} - 1$
	$2(-1) = (-1)^{51} - 1$
	9(-1) = -2
	p+1 is a factor of p50-1 because f(-1)=b,
	because $f(-1)=b$, but it is not factor of p^{SI-1} because $g(-1)=-2\neq 0$.
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	$p(x) = ax^3 - x^2 + x + 4$
	$P(-1) = \alpha(-1)^3 - (-1)^2 + (-1) + 4$
	$= -\alpha - 1 - 1 + 4$
	$= -\alpha + 1 + 4$ $= -\alpha + 2 \Rightarrow 0$
	[9 = 2]

A)	
	N = 1 - J2
	$\frac{1}{\lambda} = \frac{1}{1-\sqrt{2}} \times \frac{1+\sqrt{2}}{1+\sqrt{2}}$
	$= 1 + \sqrt{2} \qquad \text{fusing } \Rightarrow \alpha^2 - b^2$ $(1)^2 - (\sqrt{2})^2 \qquad z(a-b)(a+b)$
	$= \frac{1+\sqrt{2}}{1-2}$
	$= \underbrace{1+\sqrt{2}}_{-1} = -(1+\sqrt{2})$ $= \underbrace{1+\sqrt{2}}_{1}$ $= \underbrace{1+\sqrt{2}}_{2}$
	$((1-\sqrt{2})-(-1-\sqrt{2}))^{2}$
	$(1-\sqrt{2})^2 + (-1-\sqrt{2})^2 - 2(1-\sqrt{2})(-1-\sqrt{2})$
	$= (1)^{2} + (\sqrt{2})^{2} - 2(1)(\sqrt{2}) + (1)^{2} + (\sqrt{2})^{2}$ $- 2(1)(\sqrt{2}) - 2(1 - \sqrt{2})(-1 - \sqrt{2})$
	= 1+2-252+1+2+252-2
	z 4





Or

15(B)

Step 1: Rewrite using negative exponents

Recall that $x^{-r}=rac{1}{x^r}$, so:

$$\begin{aligned} \frac{3}{216^{-\frac{2}{3}}} &= 3 \cdot 216^{\frac{2}{3}} \\ \frac{1}{256^{-\frac{3}{4}}} &= 256^{\frac{3}{4}} \\ \frac{2}{243^{-\frac{1}{5}}} &= 2 \cdot 243^{\frac{1}{5}} \end{aligned}$$

Thus the expression becomes:

$$3 \cdot 216^{\frac{2}{3}} + 256^{\frac{2}{4}} + 2 \cdot 243^{\frac{1}{5}}$$

Step 2: Simplify each part

First term:

$$\begin{array}{ccc} 216 = 6^3 & \Longrightarrow & 216^{\frac{2}{3}} = (6^3)^{\frac{2}{3}} = 6^2 = 36 \\ \\ \Rightarrow & 3 \cdot 216^{\frac{2}{3}} = 3 \times 36 = \boxed{108} \end{array}$$

Second term:

$$256 = 2^8 \implies 256^{\frac{3}{4}} = (2^8)^{\frac{3}{4}} = 2^6 = \boxed{64}$$

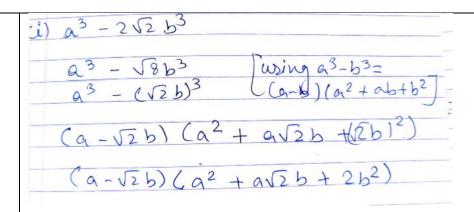
Third term:

$$\begin{array}{ccc} 243 = 3^5 & \Longrightarrow & 243^{\frac{1}{5}} = (3^5)^{\frac{1}{5}} = 3 \\ \\ \Rightarrow & 2 \cdot 243^{\frac{1}{5}} = 2 \times 3 = \boxed{6} \end{array}$$

Step 3: Add them all together

$$108 + 64 + 6 = \boxed{178}$$

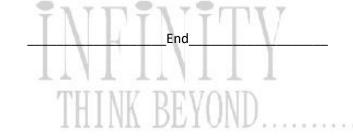
16	
10	$P(t) = t^4 + 3t^2 - 4$
	(i) degner of p(t) is I
	(ii) $P(4) = (4)^{4} + 3(4)^{2} - 4$ = 256 + 48 - 4
	= 300
	(iii) (a) $p(t) = t^{4} + 3t^{2} - 4$
	$1 et t^2 = x$
	$P(x) = x^{2} + 3x - 4$ $= x^{2} + 4x - x - 4$ $= x(x+4) + (x+4)$ $= (x-1)(x+4)$
	$p(t) = (t^2 - 1)(t^2 + 4)$ = $(t - 1)(t + 1)(t^2 + 4)$ (iii)(b) Given $t - 1$ es a ferctor
	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
	Remaining Jactor $t^3 + 3t^2$ $t^3 - t^2$
	$t^{3}+t^{2}+4t+4$ (-) (+) $t^{2}(++1)+4(t+1)$ $4t^{2}-4$
	(+2+4)(+1) cy+2+4+
	41-9
17	



(ii)
$$2\sqrt{2}\,a^3+8b^3-27c^3+18\sqrt{2}\,abc$$
 Rewrite as $(\sqrt{2}a)^3+(2b)^3+(-3c)^3-3(\sqrt{2}a)(2b)(-3c)$. Use $A=\sqrt{2}a,\ B=2b,\ C=-3c$ in $A^3+B^3+C^3-3ABC$:
$$(\sqrt{2}a+2b-3c)\left(2a^2+4b^2+9c^2-2\sqrt{2}\,ab+6bc+3\sqrt{2}\,ac\right).$$

(iii)
$$a^3-b^3+1+3ab$$

 Group as $a^3+1^3+(-b)^3-3a\cdot 1\cdot (-b)$.
 Use $A=a,\ B=1,\ C=-b$ in $A^3+B^3+C^3-3ABC$:
$$(a+1-b)\left(a^2+1+b^2-a+ab-b\right)=(a-b+1)\left(a^2+b^2+1-a+b+ab\right).$$



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