TRIGONOMETRY

SHEET 06

Questions which can be solved by using options & assuming values

$\theta = 45^\circ$

$= \frac{2+1+1}{2} = 2$

1. $\frac{2+\tan^2\theta+\cot^2\theta}{\sec\theta.\operatorname{cosec}\theta}$ **is equal to :**

SSC CGL 4 June 2019 (Morning)

(a) $\cot\theta$ **(b)** $\cos\theta.\sin\theta$ $\frac{1}{2}$

(c) $\sec\theta.\operatorname{cosec}\theta$ 2 **(d)** $\tan\theta$ 1

2. The value of θ when $\sqrt{3}\cos\theta + \sin\theta = 1$ $(0^\circ \leq \theta \leq 90^\circ)$, is

SSC CGL 4 June 2019 (Evening)

(a) 90° (b) 60°

(c) 30° (d) 0°

$\theta = 45^\circ$

$\sqrt{2+2} \times \sqrt{1-\frac{1}{2}}$

$= \sqrt{2} \times \frac{1}{\sqrt{2}}$

$= \sqrt{2}$

3. The value of $\sqrt{\sec^2\theta + \operatorname{cosec}^2\theta} \times \sqrt{\tan^2\theta - \sin^2\theta}$ is equal to :

SSC CGL 6 June 2019 (Morning)

(a) $\operatorname{cosec}\theta . \sec^2\theta$ ← $2\sqrt{2}$

(b) $\sin\theta . \sec^2\theta$ $\frac{1}{\sqrt{2}} \cdot 2\sqrt{2}$

(c) $\sin\theta . \cos^2\theta$ ← $\frac{1}{2\sqrt{2}}$ $\frac{1}{\sqrt{2}} \cdot \frac{1}{2}$

(d) $\operatorname{cosec}\theta . \cos^2\theta$ $\sqrt{2} \cdot \frac{1}{2} = \frac{1}{\sqrt{2}}$

$\theta = 45^\circ$

* $\sin\theta = \cos\theta = \frac{1}{\sqrt{2}}$
* $\sec\theta = \operatorname{cosec}\theta = \sqrt{2}$
* $\tan\theta = \cot\theta = 1$

$\theta = 45^\circ$

$$2\times\left(\sqrt{2}-\frac{1}{\sqrt{2}}\right)^2-(1-1)^2$$

$$=2\times\left(\frac{2-1}{\sqrt{2}}\right)^2$$

$$=2\times\left(\frac{1}{\sqrt{2}}\right)^2$$

$$=2\times\frac{1}{2}$$

$$=1$$

4. **$(\text{cosec}A - \sin A)^2 + (\sec A - \cos A)^2 - (\cot A - \tan A)^2$ is equal to :**

SSC CPO 2018, 16 March 2019 (Evening)

(a) 2 **(b) 0**

(c) 1 **(d) – 1**

Note:- जब भी options Number के Form में दिये हो तब आप उस सवाल को 100% Value Putting से बनायेंगे।

$3\sin\theta = 2\cos^2\theta$

(a) $\theta = 30°$

$3 \times \frac{1}{2}$ | 2×3, 4, 2

$\frac{1}{3} + \frac{4}{3} - 4$

$= \frac{5}{3} - 4$

$= \frac{5-12}{3} = -\frac{7}{3}$

5. If $3\sin\theta = 2\cos^2\theta$, $0° < \theta < 90°$, then the value of $(\tan^2\theta + \sec^2\theta - \operatorname{cosec}^2\theta)$ is :

SSC CGL 10 June 2019 (Morning)

(a) -2

(b) $-\frac{7}{3}$

(c) $\frac{7}{3}$

(d) 2

$\frac{\frac{1}{2}\cdot\frac{4}{3}^{2}}{\frac{1}{3}+\frac{3}{4}=\frac{13}{12}}$

6. If $\sin\theta.\sec^2\theta = \frac{2}{3}$, $0^\circ < \theta < 90^\circ$, then the value of $(\tan^2\theta + \cos^2\theta)$ is :

SSC CHSL 3 July 2019 (Morning)

(a) $\frac{7}{6}$

(b) $\frac{11}{12}$

(c) $\frac{13}{12}$

(d) $\frac{5}{4}$

$\frac{2\sin x}{1+\sin x+\cos x} = \frac{c}{1+\sin x}$

$x = 45°$

$\Rightarrow \frac{2 \times \frac{1}{\sqrt{2}}}{1+\frac{1}{\sqrt{2}}+\frac{1}{\sqrt{2}}} = \frac{c}{1+\frac{1}{\sqrt{2}}}$

$\Rightarrow \frac{\sqrt{2}}{1+\sqrt{2}} = \frac{c \times \sqrt{2}}{\sqrt{2}+1}$

$c = 1$

7. Let $a = \frac{2\sin x}{1+\sin x+\cos x}$ and $b = \frac{c}{1+\sin x}$,

If a = b then c = ?

SSC CGL 6 June 2019 (Afternoon)

(a) $1 - \sin x.\cos x$ (b) $1 + \sin x - \cos x$

(c) $1 + \sin x.\cos x$ (d) $1 + \cos x.\sin x$

$\frac{2\sin x}{1+\sin x+\cos x} = \frac{c}{1+\sin x}$

$x = 90°$ → $c = 0$, $s = 1$

$\frac{2}{1+1+0} = \frac{c}{1+1}$

$c = 2$

7. Let $a = \frac{2\sin x}{1+\sin x+\cos x}$ and $b = \frac{c}{1+\sin x}$.

If a = b then c = ?

SSC CGL 6 June 2019 (Afternoon)

(a) 1 − sinx.cosx (b) 1 + sinx − cosx

(c) 1 + sinx.cosx (d) 1 + cosx.sinx

$\alpha = 0^\circ \qquad \beta = 45^\circ$

$$\sqrt{2} + \frac{1/\sqrt{2}}{\frac{1}{\sqrt{2}} - 1} = \frac{x}{0 - \frac{1}{\sqrt{2}}} + \frac{\frac{1}{\sqrt{2}}}{\frac{1}{\sqrt{2}} + 1}$$

$$\Rightarrow \sqrt{2} + \frac{1}{1 - \sqrt{2}} = -\sqrt{2}x + \frac{1}{1 + \sqrt{2}}$$

$$\Rightarrow \sqrt{2} - \sqrt{2} - 1 = -\sqrt{2}x + \sqrt{2} - 1$$

$$\Rightarrow \sqrt{2}x = \sqrt{2} \Rightarrow x = 1$$

8. If $\dfrac{\cos\alpha}{\sin\alpha + \cos\beta} + \dfrac{\cos\beta}{\sin\beta - \cos\alpha} = \dfrac{x}{\sin\alpha - \cos\beta} + \dfrac{\cos\beta}{\sin\beta + \cos\alpha}$, then x is equal to :

SSC CHSL 8 July 2019 (Morning)

(a) $\cos\beta$ $\frac{1}{\sqrt{2}}$ (b) $\cos\alpha$ 1

(c) $\sin\beta$ $\frac{1}{\sqrt{2}}$ (d) $\sin\alpha$ 0

$\left(2\times\left(\frac{1}{\sqrt{2}}\right)^6-1\right)(2\times1+2)$

$=\left(2\times\frac{1}{8}-1\right)\times4$

$=\left(\frac{1}{4}-1\right)\times4$

$=-\frac{3}{4}\times4$

9. **The value of the expression**

$(\cos^6\theta + \sin^6\theta - 1)(\tan^2\theta + \cot^2\theta + 2)$ is :

SSC CGL Tier-II (11 September, 2019)

(a) 0 **(b) – 1**

(c) – 3 **(d) 1**

A=0°

10. $\frac{(2\sin A)(1+\sin A)}{1+\sin A+\cos A}$ **is equal to :**

SSC CGL Tier-II (11 September, 2019)

(a) $1+\sin A-\cos A$ (b) $1-\sin A.\cos A$

(c) $1+\cos A-\sin A$ (d) $1+\sin A.\cos A$

Note Sinθ, cosθ

θ=45° ✗ | θ=0° ✓ 90° ✓

$\phi = 45^\circ$

11. **The value of $\tan^2\varphi + \cot^2\varphi - \sec^2\varphi.\text{cosec}^2\varphi$ is equal to :**

SSC CGL Tier-II (12 September, 2019)

(a) – 2 (b) 1

(c) 0 (d) – 1

$1+1-2\times2$

$(1+1-\sqrt{2})\left(1+\frac{1}{\sqrt{2}}\times\sqrt{2}\right)\sqrt{2}$

$= (2-\sqrt{2})(1+\sqrt{2})\times\sqrt{2}$

$= (2-\sqrt{2})(2+\sqrt{2})$

$= 4-2 = 2$

12. **The value of $(1 + \cot\theta - \text{cosec}\theta)(1 + \cos\theta + \sin\theta)\sec\theta$ = ?**

SSC CGL Tier-II (13 September, 2019)

(a) -2 **(b)** 2

(c) $\sec\theta.\text{cosec}\theta$ **(d)** $\sin\theta.\cos\theta$

$\left(1+\frac{4}{3}-\frac{5}{3}\right)\left(1+\frac{4}{5}+\frac{3}{5}\right)\frac{5}{4}$

$=\left(1-\frac{1}{3}\right)\left(1+\frac{7}{5}\right)\times\frac{5}{4}$

$=\frac{2}{3}\times\frac{12}{5}\times\frac{5}{4}$

$=2$

12. **The value of $(1 + \cot\theta - \text{cosec}\theta)(1 + \cos\theta + \sin\theta)\sec\theta$ = ?**

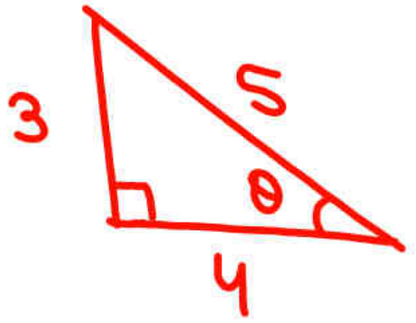
SSC CGL Tier-II (13 September, 2019)

(a) -2 **(b)** 2

(c) $\sec\theta.\text{cosec}\theta$ **(d)** $\sin\theta.\cos\theta$

$\frac{5}{4}\times\frac{5}{3}=\frac{25}{12}$

$\frac{3}{5}\times\frac{4}{5}=\frac{12}{25}$



$\theta = 0^\circ$

$S = 0 \quad C = 1$

$$\frac{2(0+1)-3(0+1)}{1-0-2}$$

$$= \frac{2-3}{-1} = \frac{-1}{-1} = 1$$

13. The value of

$$\frac{2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta)}{\cos^4\theta - \sin^4\theta - 2\cos^2\theta}$$ **is :**

SSC CGL Tier-II (13 September, 2019)

(a) – 1 **(b) – 2**

(c) 2 **(d) 1**

$\theta = 45^\circ$

$$= \frac{1 - \frac{1}{2} \times \frac{1}{2}}{\frac{1}{4} + \frac{1}{4}} - 1$$

$$= \frac{\frac{3}{4}}{\frac{2}{4}} - 1$$

$$= \frac{3}{2} - 1$$

$$= \frac{1}{2}$$

14. **The value of $\dfrac{1 - \sin^2\theta\cos^2\theta}{\sin^4\theta + \cos^4\theta} - 1$ is :**

SSC CGL 7 March 2020 (Morning)

(a) $2\sin^2\theta\cos^2\theta$ **(b)** -1

(c) 0 **(d)** 1

$2 \times \frac{1}{2} \times \frac{1}{2}$

$$\frac{1+\frac{1}{2}-\frac{\sqrt{3}}{2}}{1+\frac{1}{2}+\frac{\sqrt{3}}{2}}+\frac{1+\frac{1}{2}+\frac{\sqrt{3}}{2}}{1+\frac{1}{2}-\frac{\sqrt{3}}{2}}$$

15. If $\frac{(1+\sin\theta-\cos\theta)}{(1+\sin\theta+\cos\theta)}+\frac{(1+\sin\theta+\cos\theta)}{(1+\sin\theta-\cos\theta)}=4$, then which of the following values will be suitable for θ ?

SSC CHSL 13/10/2020 (Afternoon)

(a) 90° (b) 60°

(c) 45° (d) 30°

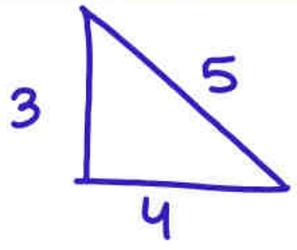
$$= \frac{\frac{3}{2}-\frac{\sqrt{3}}{2}}{\frac{3}{2}+\frac{\sqrt{3}}{2}}+\frac{\frac{3+\sqrt{3}}{2}}{\frac{3-\sqrt{3}}{2}}$$

$$= \frac{\sqrt{3}(\sqrt{3}-1)}{\sqrt{3}(\sqrt{3}+1)}+\frac{\sqrt{3}(\sqrt{3}+1)}{\sqrt{3}(\sqrt{3}-1)}$$

$$= \frac{(\sqrt{3}-1)^2+(\sqrt{3}+1)^2}{3-1} = \frac{3+1-2\sqrt{3}+3+1+2\sqrt{3}}{2} = 4$$

$x = \frac{5}{3} + \frac{4}{5}$

$= \frac{37}{15}$



$y = \frac{5}{3} - \frac{4}{5} = \frac{13}{15}$

16. **If x = cosecA + cosA and y = cosecA – cosA, then find the value of**

$$\left(\frac{2}{x+y}\right)^2 + \left(\frac{x-y}{2}\right)^2 - 1.$$

SSC CHSL 19/10/2020 (Morning)

(a) 3 **(b) 0**

(c) 2 **(d) 1**

$= \left(\frac{2}{\frac{50}{15}}\right)^2 + \left(\frac{\frac{24}{15}}{2}\right)^2 - 1$

$= \left(\frac{2 \times 15}{50}\right)^2 + \left(\frac{24}{15 \times 2}\right)^2 - 1$

$= \frac{9}{25} + \frac{16}{25} - 1$

$= 1 - 1 = 0$

16. If x = cosecA + cosA and y = cosecA – cosA, then find the value of

$$\left(\frac{2}{x+y}\right)^2+\left(\frac{x-y}{2}\right)^2-1.$$

SSC CHSL 19/10/2020 (Morning)

(a) 3 (b) 0

(c) 2 (d) 1

$$\left(\frac{2}{2\,\mathrm{cosec}A}\right)^2+\left(\frac{2\cos A}{2}\right)^2-1$$

$$=(\sin A)^2+(\cos A)^2-1$$

$$=1-1=0$$

$x = \mathrm{cosec}A + \cos A$

$y = \mathrm{cosec}A - \cos A$

A = 45°

17. **The value of $(\tan^2 A + \cot^2 A - 2) - \sec^2 A \operatorname{cosec}^2 A$ is :**

CGL 2019 Tier-II (16/10/2020)

(a) – 4
(b) – 1
(c) 1
(d) 4

$(1+1-2)-(2\times2)$

$0-4$

$$\left(\frac{\frac{3}{5}+\frac{4}{5}-1}{\frac{3}{5}-\frac{4}{5}+1}\right)\times\sqrt{\frac{1+\frac{3}{5}}{1-\frac{3}{5}}}$$

18. **The value of** $\dfrac{\sin\theta+\cos\theta-1}{\sin\theta-\cos\theta+1}\times\sqrt{\dfrac{1+\sin\theta}{1-\sin\theta}}$

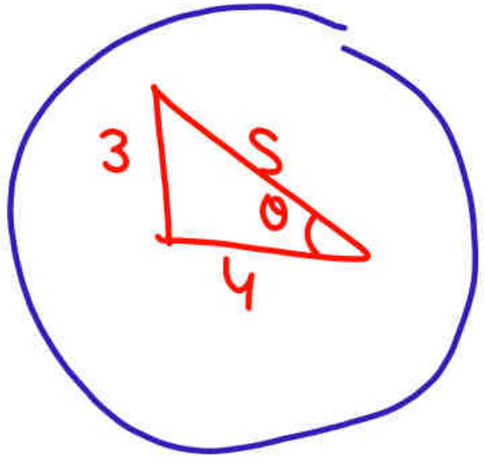
CGL 2019 Tier-II (16/10/2020)

$$=\left(\frac{\frac{7}{5}-1}{-\frac{1}{5}+1}\right)\times\sqrt{\frac{\cdots}{\cdots}}\ 4$$

$$=\frac{\frac{2}{5}}{\frac{4}{5}}\times 2 \quad =\frac{4}{4}=1$$

(a) 1 (b) – 1

(c) – 2 (d) 2



$$\frac{\frac{5}{4}\left(\frac{5}{4}+\frac{3}{4}\right)\times\left(1-\frac{3}{5}\right)}{\left(\frac{4}{5}\right)^2}$$

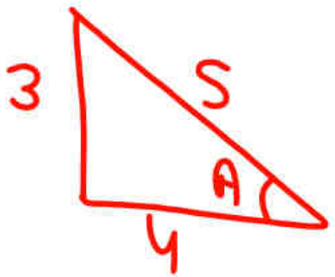
$$= \frac{\frac{5}{4}\times\frac{8}{4}\times\frac{2}{5}}{\frac{4}{5}\times\frac{4}{5}} = \frac{25}{16}$$

19. $\dfrac{\sec A(\sec A+\tan A)(1-\sin A)}{(\operatorname{cosec}^2 A-1)\sin^2 A}$ **is equal to :**

CGL 2019 Tier-II (16/10/2020)

(a) $\sec^2 A = \frac{25}{16}$ **(b)** $\cos^2 A$

(c) $\cot A$ **(d)** $\cos A$



$3(0-1)^4+6(0+1)^2+4(0+1)$

$= 3+6+4$

20. **The value of $3(\sin x - \cos x)^4 + 6(\sin x + \cos x)^2 + 4(\sin^6 x + \cos^6 x)$ is :**

(a) 14 **(b) 11**

(c) 12 **(d) 13**

$x=0^\circ \quad S=0 \quad C=1$

$3(0+1)+2(0+1)+12\times0\times1$

$= 3+2+0$

21. **The value of the following is : $3(\sin^4\theta + \cos^4\theta) + 2(\sin^6\theta + \cos^6\theta) + 12\sin^2\theta.\cos^2\theta$**

(a) 0 **(b) 3**

(c) 2 **(d) 5**

$\theta = 0^\circ \quad S = 0 \quad C = 1$

$\frac{x}{a} = \sin\theta + \cos\theta$

$\Rightarrow \frac{x}{a} = 1$

$\frac{y}{b} = \sin\theta - \cos\theta$

$\frac{y}{b} = -1$

22. If $x = a(\sin\theta + \cos\theta)$, $y = b(\sin\theta - \cos\theta)$, then the value of $\frac{x^2}{a^2} + \frac{y^2}{b^2}$ is :

(a) 0 (b) 1

(c) 2 (d) -2

$1^2 + (-1)^2 = 2$

$\theta = 0^\circ \quad S = 0 \quad C = 1$

$\theta = \phi = 45^\circ$

$x = a \times \sqrt{2} \times \frac{1}{\sqrt{2}} \Rightarrow \frac{x}{a} = 1$

$y = b \times \sqrt{2} \times \frac{1}{\sqrt{2}} \Rightarrow \frac{y}{b} = 1$

$z = c\tan\theta \Rightarrow \frac{z}{c} = 1$

23. If $x = a\sec\theta\cos\phi$, $y = b\sec\theta.\sin\phi$, $z = c\tan\theta$, then the value of $\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2}$ is :

SSC CHSL 15/10/2020 (Evening)

(a) 1
(b) 4
(c) 9
(d) 0

$1 + 1 - 1$

$$(1+\sin\alpha)(1+\sin\beta)(1+\sin\gamma) = k$$

$$(1-\sin\alpha)(1-\sin\beta)(1-\sin\gamma) = k$$

$$(1-\sin^2\alpha)(1-\sin^2\beta)(1-\sin^2\gamma) = k^2$$

$$\Rightarrow \cos^2\alpha \cdot \cos^2\beta \cdot \cos^2\gamma = k^2$$

$$\Rightarrow \boxed{\pm \cos\alpha \cos\beta \cos\gamma = k}$$

$\alpha = \beta = \gamma = 0$

24. If $(1 + \sin\alpha)(1 + \sin\beta)(1 + \sin\gamma) = (1 - \sin\alpha)(1 - \sin\beta)(1 - \sin\gamma)$, then each side is equal to :

(a) $\pm \cos\alpha . \cos\beta . \cos\gamma$

(b) $\pm \sin\alpha . \sin\beta . \sin\gamma$

(c) $\pm \sin\alpha . \cos\beta . \cos\gamma .$

(d) $\pm \sin\alpha . \sin\beta . \cos\gamma$

$\theta = 45^\circ$

$x = \sqrt{2} - \frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}}$

$y = \sqrt{2} - \frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}}$

$x = y$

25. If $\text{cosec}\theta - \sin\theta = x$ and $\sec\theta - \cos\theta = y$, then

$$x^{\frac{2}{3}} y^{\frac{2}{3}} \left(x^{\frac{2}{3}} + y^{\frac{2}{3}} \right) = ?$$

(a) 0 (b) 1

(c) – 1 (d) 2

$x^{\frac{4}{3}} \cdot 2 \cdot x^{\frac{2}{3}} = 2 \cdot x^{\frac{4}{3}} \cdot x^{\frac{2}{3}}$

$= 2 \cdot x^{\frac{4}{3}+\frac{2}{3}}$

$= 2 \cdot x^2 = x \times \frac{1}{x}$

$\theta = 0°$

$x = 0+0 = 0$

$y = 1+1 = 2$

$(x^2+y^2)(x^2+y^2-3)$

$= (0+4)(0+4-3)$

$= 4 \times 1 = 4$

26. If $\sin\theta + \sin 2\theta = x$ and $\cos\theta + \cos 2\theta = y$, then $(x^2 + y^2)(x^2 + y^2 - 3) = ?$

(a) $2y = 4$

(b) $3y = 6$

(c) $-2y = -4$

(d) $4y = 8$

$\sin^2A + \sin^2B + \sin^2C - 2\cos A \cos B \cdot \cos C$

$= 3\sin^2A - 2\cos^3A$

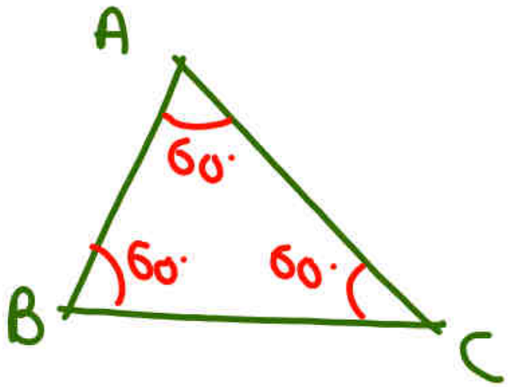
$= 3 \times \frac{3}{4} - 2 \times \frac{1}{8}$ 4

$= \frac{8}{4} = 2$

27. **If A, B, C are the agles of a triangle, then the value of expression$\sin^2A + \sin^2B + \sin^2C - 2\cos A.\cos B.\cos C$ = ?**

(a) 1 **(b) 2**

(c) 3 **(d) 4**



$\sin^2A + \sin^2B + \sin^2C - 2\cos A \cos B \cdot \cos C$

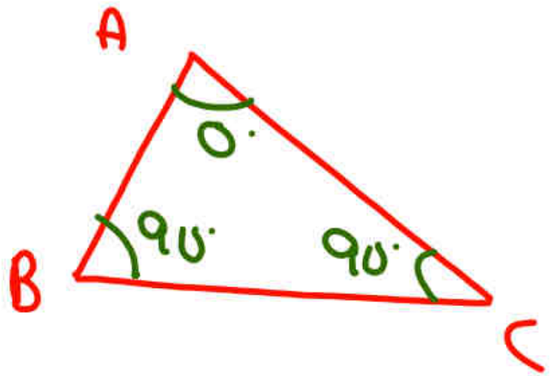
$= 0 + 1 + 1 - 2 \times 1 \times 0 \times 0$

$= 2 - 0$

27. **If A, B, C are the agles of a triangle, then the value of expression $\sin^2A + \sin^2B + \sin^2C - 2\cos A.\cos B.\cos C$ = ?**

(a) 1 (b) 2

(c) 3 (d) 4



$x = 0$

$= 1 + 1 + 1 + 1$

$= 4$

28. $1 + \cos 2x + \cos 4x + \cos 6x = ?$

(a) $2\cos x.\cos 2x.\cos 3x$

(b) $4\sin x.\cos 2x.\cos 3x$

(c) $4\cos x.\cos 2x.\cos 3x$

(d) $\cos x.\cos 2x.\cos 3x$

$A = B = C = D = 0^\circ$

29. What is the value of $\sin(B - C)\cos(A - D) + \sin(A - B)\cos(C - D) + \sin(C - A)\cos(B - D)$?

(a) $\frac{3}{2}$ **(b) -3**

(c) 1 **(d) 0**

$= \sin(B-C)\cdot\cos(A-D) + \sin(A-B)\cos(C-D) + \sin(C-A)\cdot\cos(B-D)$

$0 + 0 + 0$

30. If $P + Q + R = 60°$, then what is the value of $\cos Q.\cos R\,(\cos P - \sin P) + \sin Q.\sin R\,(\sin P - \cos P)$

(a) $\frac{1}{2}$ (b) $\frac{\sqrt{3}}{2}$

(c) $\frac{1}{\sqrt{2}}$ (d) $\sqrt{2}$

$= \frac{1}{2} \times 1 (1 - 0) + \frac{\sqrt{3}}{2} \times 0 \times$ ——

$= \frac{1}{2} + 0$

$X = Y = Z = 45^\circ$

$\frac{\sin 0^\circ + \sin 90^\circ + 2\sin 45^\circ}{\sin 0 + \sin 90 + 2\sin 45^\circ} = 1$

31. What is the value of

$$\frac{[\sin(y - z) + \sin(y + z) + 2\sin y]}{[\sin(x - z) + \sin(x + z) + 2\sin x]}\ ?$$

(a) $\cos x.\sin y$ $\frac{1}{2}$

(b) $\frac{\sin y}{\sin x}$ 1

(c) $\sin z$ $\frac{1}{\sqrt{2}}$

(d) $\sin x.\tan y$ $\frac{1}{\sqrt{2}}$

Note:- $(1+\tan\theta)$ or $(1-\cot\theta)$

Take → $\theta = 135^\circ$

$\tan 135^\circ = \cot 135^\circ = -1$

$\sin 135^\circ = \frac{1}{\sqrt{2}}$

$\cos 135^\circ = -\frac{1}{\sqrt{2}}$

32. If $\frac{\tan\theta}{1-\cot\theta} + \frac{\cot\theta}{1-\tan\theta} = 1 + k$, then k = ?

SSC CGL 7 June 2019 (Evening)

(a) $\cot\theta + \sec\theta$ (b) $\tan\theta.\operatorname{cosec}\theta$

(c) $\tan\theta + \sec\theta$ (d) $\operatorname{cosec}\theta.\sec\theta$

$\sqrt{2}\cdot(-\sqrt{2}) = -2$

$\Rightarrow \frac{-1}{1-(-1)} + \frac{-1}{1-(-1)} = 1+k$

$\Rightarrow -\frac{1}{2} - \frac{1}{2} = 1+k$

$\Rightarrow -1 = 1+k$

$\Rightarrow -2 = k$

$A = 0^\circ \Rightarrow S = 0, C = 1$

$0 = \frac{0}{2}$

33. $\frac{(2\sin A)(1+\sin A)}{1+\sin A+\cos A}$ **is equal to :**

SSC CGL Tier-II (11 September 2019)

$1 + 0 - 1$

(a) $1 + \sin A - \cos A$ (b) $1 - \sin A\cos A$

(c) $1 + \cos A - \sin A$ (d) $1 + \sin A\cos A$

$1 + 1 - 0$

$\varphi = 45^\circ$

34. **The value of $\tan^2\varphi + \cot^2\varphi - \sec^2\varphi.\text{cosec}^2\varphi$ is equal to :** $1 + 1 - 2 \times 2 = -2$

SSC CGL Tier-II (12 September 2019)

(a) – 2 **(b) 1**

(c) 0 **(d) – 1**

$\theta = 45°$

$1 + 1 - (2 + 2)$

$= 2 - 4 = -2$

35. The value of

$$\frac{\sec^2\theta}{\operatorname{cosec}^2\theta} + \frac{\operatorname{cosec}^2\theta}{\sec^2\theta} - (\sec^2\theta + \operatorname{cosec}^2\theta)$$ **is :**

SSC CGL Tier-II (13 September 2019)

(a) 0 (b) – 2

(c) 2 (d) 1

$\theta = 0^\circ$ $S = 0$ $C = 1$

36. The value of

$$\frac{2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta)}{\cos^4\theta - \sin^4\theta - 2\cos^2\theta}$$ **is :**

SSC CGL Tier-II (13 September 2019)

(a) – 1 **(b) – 2**

(c) 2 **(d) 1**

$$= \frac{2(0+1) - 3(0+1)}{1 - 0 - 2\times 1}$$

$$= \frac{2-3}{-1} = \frac{-1}{-1} = 1$$

$\theta = 45^\circ$

37. The expression $3\sec^2\theta.\tan^2\theta + \tan^6\theta - \sec^6\theta$ is equal to :

SSC CGL 4 March 2020 (Afternoon)

(a) – 2 **(b) 1**

(c) 2 **(d) – 1**

$(\sqrt{2})^6$

$= 2^{\frac{1}{2}\times 6}$

$= 2^3$

$= 8$

$3 \times 2 \times 1 + 1 - (\sqrt{2})^6$

$= 7 - 8$

$= -1$

$\theta = 45^\circ$

$$= \frac{(\sqrt{2})^6 - 1 - 3 \times 2 \times 1 + 1}{2 \times \frac{1}{2} + 2}$$

$$= \frac{8 - 1 - 6 + 1}{3} = \frac{2}{3}$$

38. **The value of**

$$\frac{\sec^6\theta - \tan^6\theta - 3\sec^2\theta\tan^2\theta + 1}{\cos^4\theta - \sin^4\theta + 2\sin^2\theta + 2}$$ **is :**

SSC CGL 5 March 2020 (Morning)

(a) $\frac{2}{3}$ **(b)** 1

(c) $\frac{3}{4}$ **(d)** $\frac{1}{2}$

$A = 0^\circ$ $\cos 0^\circ = 1$
$\sec 0^\circ = 1$

39. The value of $4\left[\dfrac{(1-\sec A)^2+(1+\sec A)^2}{1+\sec^2 A}\right]$ **is :**

SSC CGL 6 March 2020 (Evening)

(a) 2 **(b) 4**
(c) 8 **(d) 1**

$$= 4\left[\frac{(1-1)^2+(1+1)^2}{1+1}\right]$$

$$= \frac{4\times 4}{2}$$

40. If $x = \text{cosec}A + \cos A$ and $y = \text{cosec}A - \cos A$, then find the value of $\left(\frac{2}{x+y}\right)^2 + \left(\frac{x-y}{2}\right)^2 - 1$.

Repeat of Q.16

SSC CHSL 19/10/2020 (Morning)

(a) 3
(b) 0
(c) 2
(d) 1

A=45°

41. **The value of $(\tan^2 A + \cot^2 A - 2) - \sec^2 A \operatorname{cosec}^2 A$ is :**

SSC CGL 2019, Tier-II (16/10/2020)

(a) – 4 (b) – 1

(c) 1 (d) 4

$(1+1-2) - 2 \times 2$

$0 - 4$

θ = 45°

H·W

42. If $(\sin\theta + \text{cosec}\theta)^2 + (\cos\theta + \sec\theta)^2 = k + \tan^2\theta + \cot^2\theta$, then the value of k is equal to :

SSC CGL 2019, Tier-II (18/10/2020)

(a) 7
(b) 2
(c) 9
(d) 5