KHAN GLOBAL STUDIES

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Defence (Mathematics)

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Trigonometry DPPS

1. The value of $cos^2(A-B)+cos^2B-2\cos(A-B)\cos A\cos B$ value of is

   (a) $\sin A$ (b) sin^2A

   (c) cos^2A (d) $\cos A$

2. If $\cos 20°-\sin 20°=p$, then $\cos 40°$ is equal to:

   (a) $p^2\sqrt{2-p^2}$ (b) $p\sqrt{2-p^2}$

   (c) $p+\sqrt{2-p^2}$ (d) $p-\sqrt{2-p^2}$

3. If $A+B+C=180^\circ$, then the value of $(\cot B+\cot C)(\cot C+\cot A)(\cot A+\cot B)$ will be

   (a) $\sec A\sec B\sec A$

   (b) $cosec\ A\ cosec\ B\ cosec\ C$

   (c) $\tan A\tan B\tan C$

   (d) 1

4. Which of the following is rational?

   (a) $\sin 15^\circ$ (b) $\cos 15^\circ$

   (c) $\sin 15^\circ\cos 15^\circ$ (d) $\sin 15^\circ\cos 75^\circ$

5. θ eliminant between the equations $x=a\ sec^3\theta, y=b\ tan^3\theta$ is

   (a) $\left(\frac{x}{a}\right)^{2/3}+\left(\frac{y}{b}\right)^{2/3}=1$

   (b) $\left(\frac{x}{a}\right)^{2/3}-\left(\frac{y}{b}\right)^{2/3}=1$

   (c) $\left(\frac{x}{a}\right)^{2/3}-\left(\frac{y}{b}\right)^{\frac{2}{3}}=-1$

   (d) None of these

6. If $\sin\theta+\cos\theta=m$,and $\sec\theta+cosec\ \theta=n$, then

   (a) $2n=m(n^2-1)$ (b) $2m=n(m^2-1)$

   (c) $2n=m(m^2-1)$ (d) None of these

7. If $\cot\theta+\tan\theta=m$ and $\sec\theta-\cos\theta=n$, then which of the following is correct?

   (a) $m(mn^2)^{1/3}-n(nm^2)^{\frac{1}{3}}=1$

   (b) $m(m^2n)^{1/3}-n(nm^2)^{\frac{1}{3}}=1$

   (c) $n(mn^2)^{1/3}-m(nm^2)^{\frac{1}{3}}=1$

   (d) $n(m^2n)^{1/3}-m(m^2n)^{\frac{1}{3}}=1$

8. If $a\cos\theta+b\sin\theta=m$ and $a\sin\theta-b\cos\theta=n$, then $a^2+b^2=$

   (a) $m+n$ (b) m^2-n^2

   (c) m^2+n^2 (d) None of these

9. If $\tan(\alpha+\beta)=\sqrt{3}$, $\tan(\alpha-\beta)=1$ then $\tan 6\beta=$

   (a) -1 (b) 0

   (c) 1 (d) 2

10. If $x=r\cos\theta\cos\emptyset$, $y=r\cos\theta\sin\emptyset$, $z=r\sin\theta$ then $x^2+y^2+z^2=$

    (a) r^2 (b) y^2

    (c) x^2 (d) z^2

11. If $2\ sin^2A-cot^2B=1$ then $\sin A\sin B=$

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

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

12. $\tan\frac{\pi}{24}\tan\frac{3\pi}{24}\tan\frac{5\pi}{24}\tan\frac{7\pi}{24}\tan\frac{9\pi}{24}\tan\frac{11\pi}{24}\tan\frac{16\pi}{24}=$

    (a) 1 (b) -1

(c) $\sqrt{3}$ (d) $-\sqrt{3}$

13. $\cos A, \sin A, \cot A$ are in GP $tan^6A - tan^2A =$

(a) -1 (b) 0

(c) 1 (d) 2

14. $sin^2 5° + sin^2 10° + \cdots + sin^2 180° =$

(a) 18 (b) 27

(c) 1 (d) 0

15. If $\frac{\sin x}{a} = \frac{\cos x}{b} = \frac{\tan x}{c} = k$ then $bc + \frac{1}{ck} + \frac{ak}{1+bk}$ is

(a) $k\left(a + \frac{1}{a}\right)$ (b) $\frac{1}{k}\left(a + \frac{1}{a}\right)$

(c) $\frac{1}{k^2}$ (d) $\frac{a}{k}$

16. If $m\, cos^2A + n\, sin^2A = p$, then $cot^2A =$

(a) $\frac{p+n}{m+p}$ (b) $\frac{p-n}{p-m}$

(c) $\frac{p-n}{m-p}$ (d) $\frac{n+1}{m+p}$

17. If $\sin A - \sqrt{6}\cos A = \sqrt{7}\cos A$, then $\cos A + \sqrt{6}\sin A$ equal to

(a) $\sqrt{6}\sin A$ (b) $-\sqrt{7}\sin A$

(c) $\sqrt{6}\cos A$ (d) $\sqrt{7}\cos A$

18. In a ΔABC, if $\angle A = \frac{\pi}{2}$, then $cos^2B + cos^2C$ equals

(a) -2 (b) -1

(c) 1 (d) 0

19. If $S_n = cos^n\theta + sin^n\theta$, then the value of $3S_4 - 2S_6$ is given by

(a) 4 (b) 0

(c) 1 (d) 7

20. The value of $\tan 67\frac{1}{2}° + \cot 67\frac{1}{2}°$ is

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

(c) $2\sqrt{2}$ (d) $2 - \sqrt{2}$

21. $\cos\frac{\pi}{7}\cos\frac{2\pi}{7}\cos\frac{4\pi}{7} =$

a) 0 b) $\frac{1}{2}$

c) $\frac{1}{4}$ d) $-\frac{1}{8}$

22. $\tan\left(\frac{\pi}{4} + \frac{\theta}{2}\right) + \tan\left(\frac{\pi}{4} - \frac{\theta}{2}\right)$ is equal to

(a) $\sec\theta$ (b) $2\sec\theta$

(c) $\sec\frac{\theta}{2}$ (d) $\sin\theta$

23. If $\cos\theta = \frac{1}{2}\left(a + \frac{1}{a}\right)$, then the value of $\cos 3\theta$ is

(a) $\frac{1}{8}\left(a^3 + \frac{1}{a^3}\right)$ (b) $\frac{3}{2}\left(a + \frac{1}{a}\right)$

(c) $\frac{1}{2}\left(a^3 + \frac{1}{a^3}\right)$ (d) $\frac{1}{3}\left(a^3 + \frac{1}{a^3}\right)$

24. $cos^3\, 110° + cos^3\, 10° + cos^3\, 130° =$

(a) $\frac{3}{4}$ (b) $\frac{3}{8}$

(c) $\frac{3\sqrt{3}}{8}$ (d) $\frac{3\sqrt{3}}{4}$

25. The value of expression $\frac{2(\sin 1° + \sin 2° + \sin 3° + \cdots + \sin 89°)}{2(\cos 1° + \cos 2° + \cdots + \cos 44°) + 1}$ equals

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

(c) $\frac{1}{2}$ (d) 0

26. If A, B, C are the angles of a triangle such that $\cot\frac{A}{2} = 3\tan\frac{C}{2}$, then $\sin A, \sin B, \sin C$ are in

(a) AP (b) GP

(c) HP (d) None of these

27. If A and B are acute positive angles satisfying the equations $3sin^2A + 2sin^2B = 1$ and $2\sin 2A - 2\sin 2B = 0$, then $A + 2B$ is equal to

(a) π (b) $\frac{\pi}{2}$

(c) $\frac{\pi}{4}$ (d) $\frac{\pi}{6}$

28. $\frac{sin^2A - sin^2B}{\sin A\cos A - \sin B\cos B}$ is equal to

(a) $\tan(A - B)$ (b) $\tan(A + B)$

(c) $\cot(A - B)$ (d) $\cot(A + B)$

29. If $a = \frac{\pi}{18}$ rad, then $\cos a + \cos 2a + \cdots + \cos 18a$ is equal to

(a) 0 (b) -1

(c) 1 (d) ± 1

30. If $\sin x + sin^2 x = 1$, then $cos^{12} x + 3cos^{10} x + 3sin^8 x + cos^6 x$ is equal to

(a) 1 (b) 2

(c) 3 (d) 0

31. If $\tan A, \tan B, \tan C$ are the roots of the cubic equation $x^3 - 7x^2 + 11x - 7 = 0$ then $A + B + C =$

(a) $\frac{\pi}{2}$ (b) π

(c) $3\frac{\pi}{2}$ (d) None of these

32. $sin^2 \frac{A}{2} + sin^2 \frac{B}{2} + sin^2 \frac{C}{2} =$

(a) $1 - 2\cos\frac{A}{2}\cos\frac{B}{2}\cos\frac{C}{2}$

(b) $1 - 2\sin\frac{A}{2}\sin\frac{B}{2}\sin\frac{C}{2}$

(c) $1 + \cos\frac{A}{2}\cos\frac{B}{2}\cos\frac{C}{2}$

(d) $1 + \sin\frac{A}{2}\sin\frac{B}{2}\sin\frac{C}{2}$

33. If $A = 35°$, $B = 15°$ and $C = 40°$, then $\tan A \tan B + \tan B \tan C + \tan C \tan A$ is equal to

(a) 0 (b) 1

(c) 2 (d) 3

34. If $\cos(\theta - \alpha) = a$ and $\cos(\theta - \beta) = b$, then $sin^2(\alpha - \beta) + 2ab\cos(\alpha - \beta)$ is equal to

(a) $a^2 + b^2$ (b) $a^2 - b^2$

(c) $b^2 - a^2$ (d) $-a^2 - b^2$

35. If $\tan A = 2\tan B + \cot B$, then $2\tan(A - B)$ is equal to

(a) $\tan B$ (b) $2\tan B$

(c) $\cot B$ (d) $2\cot B$

36. If $\cos(A - B) = \frac{3}{5}$ and $\tan A \tan B = 2$, then which one of the following is correct?

(a) $\sin(A + B) = \frac{1}{5}$ (b) $\sin(A + B) = -\frac{1}{5}$

(c) $\cos(A - B) = \frac{1}{5}$ (d) $\cos(A + B) = -\frac{1}{5}$

37. If $\cos\alpha = \frac{3}{5}$, $\cos\beta = \frac{4}{5}$, $\alpha, \beta > 0$ and are acute angles, then $\cos\frac{\alpha - \beta}{2}$ is

(a) $\frac{7}{2}\sqrt{5}$ (b) $\frac{35}{2}$

(c) $\frac{3\sqrt{5}}{2}$ (d) None of these

38. If $\tan\theta = \frac{1}{\sqrt{3}}$, then the value of $\sqrt{3}\cos 2\theta + \sin 2\theta$ is

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

(c) $1 + \sqrt{3}$ (d) None of these

39. The value of $\cos\left(\frac{\pi}{13}\right) + \cos\left(\frac{2\pi}{13}\right) + \cdots + \cos\left(\frac{12\pi}{13}\right)$ is equal to

(a) 0 (b) 1

(c) 9 (d) None of these

40. $\cos\frac{\pi}{5}\cos\frac{2\pi}{5}\cos\frac{4\pi}{5}\cos\frac{8\pi}{5} =$

a) $\frac{1}{16}$ b) 0

c) $\frac{-1}{8}$ d) $\frac{-1}{16}$

41. If $\tan A - \tan B = \frac{1}{2}$ and $\cot A - \cot B = \frac{1}{3}$, then $\cot(A - B)$ is equal to:

(a) 1 (b) -1

(c) 5 (d) -5

42. If $2\cos\theta + \sin\theta = 1$, $\left(\theta \neq (4k+1)\frac{\pi}{2}, k \in I\right)$ then $7\cos\theta + 6\sin\theta$ is equal to:

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

(c) $\frac{11}{2}$ (d) $\frac{46}{5}$

43. If $0 < x < \pi$, and $\sin x + \cos x = \frac{1}{3}$, then a possible value of $\tan x$ is

(a) $\frac{1}{8}(-9 + \sqrt{17})$ (b) $\frac{1}{8}(9 - \sqrt{17})$

(c) $-\frac{1}{5}(9 + \sqrt{5})$ (d) $\frac{1}{5}(9 - \sqrt{5})$

44. If $\cos 2B = \frac{\cos(A+C)}{\cos(A-C)}$, then $\tan A$, $\tan B$, $\tan C$ are in

(a) AP (b) GP

(c) HP (d) None of these

45. The value of $\tan 6° \tan 42° \tan 66° \tan 78°$ is

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

(c) $\frac{1}{4}$ (d) $\frac{1}{8}$

46. In triangle ABC, if angle C is 90° and the area of triangle 30 sq. units, then the minimum possible value of the hypotenuse c is equal to

(a) $30\sqrt{2}$ (b) $60\sqrt{2}$

(c) $120\sqrt{2}$ (d) $2\sqrt{30}$

47. If $\sin\theta + \cos\theta = \frac{1}{5}$ and $0 \le \theta < \pi$, then $\tan\theta$ is

(a) $-\frac{4}{3}$ (b) $-\frac{3}{4}$

(c) $\frac{3}{4}$ (d) $\frac{4}{3}$

48. If $x = \frac{2\sin\theta}{1+\cos\theta+\sin\theta}$, then $\frac{1-\cos\theta+\sin\theta}{1+\sin\theta}$ is equal to

(a) $1+x$ (b) $1-x$

(c) x (d) $\frac{1}{x}$

49. If $secx + sec^2x = 1$, then the value of $tan^8x - tan^4x - 2tan^2x + 1$ is equal to

(a) 0 (b) 1

(c) 2 (d) 3

50. If $x = a\,cos^3\theta, y = b\,sin^3\theta$, then

(a) $\left(\frac{a}{x}\right)^{2/3} + \left(\frac{b}{y}\right)^{2/3} = 1$

(b) $\left(\frac{b}{x}\right)^{2/3} + \left(\frac{a}{y}\right)^{2/3} = 1$

(c) $\left(\frac{x}{a}\right)^{2/3} + \left(\frac{y}{b}\right)^{2/3} = 1$

(d) $\left(\frac{x}{b}\right)^{2/3} + \left(\frac{y}{a}\right)^{2/3} = 1$

51. If $\tan\theta + \sin\theta = m$ and $\tan\theta - \sin\theta = n$, then

(a) $m^2 - n^2 = 4mn$

(b) $m^2 + n^2 = 4mn$

(c) $m^2 - n^2 = m^2 + n^2$

(d) $m^2 - n^2 = 4\sqrt{mn}$

52. If $x = \sec\emptyset - \tan\emptyset$, $y = cosec\,\emptyset + \cot\emptyset$, then

(a) $x = \frac{y+1}{y-1}$ (b) $x = \frac{y-1}{y+1}$

(c) $y = \frac{1-x}{1+x}$ (d) None of these

53. Find the value of $\cos\left(\frac{29\pi}{3}\right)$.

(a) 1 (b) 0

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

54. If $\sin\theta = \frac{2t}{1+t^2}$ and θ lies in second quadrant, then $\cos\theta$ is

(a) $\frac{1-t^2}{1+t^2}$ (b) $\frac{t^2-1}{1+t^2}$

(c) $\frac{-|1-t^2|}{1+t^2}$ (d) $\frac{1+t^2}{1-t^2}$

55. The value of $cos^2\frac{\pi}{16} + cos^2\frac{3\pi}{16} + cos^2\frac{5\pi}{16} + cos^2\frac{7\pi}{16}$ is

(a) 2 (b) 1

(c) 0 (d) None of these

56. The maximum value of $\sin\theta + \cos\theta$ in $\left[0, \frac{\pi}{2}\right]$ is

(a) $\sqrt{2}$ (b) 0

(c) 0 (d) $-\sqrt{2}$

57. The maximum value of $4\,sin^2x + 3\,cos^2x$ is

(a) 4 (b) 3

(c) 7 (d) 5

58. If $A + B = 45°$, then $(\cot A - 1)(\cot B - 1)$ is equal to

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

(c) -1 (d) 2

59. If $\tan\theta + \sec\theta = e^x$, then $\cos\theta$ equals

(a) $\frac{(e^x+e^{-x})}{2}$ (b) $\frac{2}{(e^x+e^{-x})}$

(c) $\frac{(e^x-e^{-x})}{2}$ (d) $\frac{(e^x-e^{-x})}{(e^x+e^{-x})}$

60. The value of $sin^3 10^\circ + sin^3 50^\circ - sin^3 70^\circ$ is equal to

(a) $-\frac{3}{2}$ (b) $\frac{3}{4}$

(c) $-\frac{3}{4}$ (d) $-\frac{3}{8}$

61. If $f(\theta) = (\sin\theta + cosec\,\theta)^2 + (\cos\theta + \sec\theta)^2$ then minimum value of $f(\theta)$ is

(a) 7 (b) 8

(c) 9 (d) None of these

62. $\frac{sin^2 3A}{sin^2 A} - \frac{cos^2 3A}{cos^2 A} =$

(a) $\cos 2A$ (b) $8\cos 2A$

(c) $\frac{1}{8}\cos 2A$ (d) None of these

63. If $a = \cos 3$ and $b = \sin 8$ then

(a) $a > 0, b > 0$ (b) $ab < 0$

(c) $a > b$ (d) $ab > 0$

64. If $\sqrt{\frac{1-\sin A}{1+\sin A}} = \sec A - \tan A$ then A lies in the quadrants

(a) I,II (b) II,III

(c) I,IV (d) I,III

65. If $\sin\theta + \cos\theta = m$ and $\sec\theta + cosec\,\theta = n$, then n $(m+1)(m-1) =$

(a) m (b) n

(c) $2m$ (d) $2n$

66. If $1 + \sin x + sin^2 x + \cdots \text{to}\ \infty = 4 + 2\sqrt{3}$, $0 < x < \pi$ and $x \neq \frac{\pi}{2}$ then $x =$

(a) $30^\circ, 60^\circ$ (b) $60^\circ, 120^\circ$

(c) $90^\circ, 120^\circ$ (d) $30^\circ, 45^\circ$

67. $\frac{\pi}{2} < \alpha < \pi \Rightarrow \sqrt{\frac{1-\cos\alpha}{1+\cos\alpha}} + \sqrt{\frac{1+\cos\alpha}{1-\cos\alpha}} =$

(a) $2\sec\alpha$ (b) $-2\sec\alpha$

(c) $2\,cosec\,\alpha$ (d) $-2\,cosec\,\alpha$

68. If $\sin\beta$ is the G.M. between $\sin\alpha$ and $\cos\alpha$ then $(\cos\alpha - \sin\alpha)^2 - 2\,cos^2\beta$

(a) 0 (b) 1

(c) 2 (d) -1

69. $\cos\theta + cos^2\theta = 1$, $a\,sin^{12}\theta + b\,sin^{10}\theta + c\,sin^8\theta + d\,sin^6\theta = 1 \Rightarrow \frac{b+c}{a+d} =$

(a) 2 (b) 3

(c) 4 (d) 6

70. In a ΔABC, if $\tan A : \tan B : \tan C = 3 : 4 : 5$, then the value of $\sin A \,.\, \sin B \,.\, \sin C$ is equal to

(a) $\frac{2}{\sqrt{5}}$ (b) $\frac{2\sqrt{5}}{7}$

(c) $\frac{2\sqrt{5}}{9}$ (d) $\frac{2}{3\sqrt{5}}$

71. If $\cos\theta_1 = 2\cos\theta_2$, then $\tan\frac{\theta_1-\theta_2}{2}\tan\frac{\theta_1+\theta_2}{2}$ is equal to

(a) $\frac{1}{3}$ (b) $-\frac{1}{3}$

(c) 1 (d) -1

72. Let α and β be such that $\pi < \alpha - \beta < 3\pi$. If $\sin\alpha + \sin\beta = -\frac{21}{65}$ and $\cos\alpha + \cos\beta = -\frac{27}{65}$, then the value of $\cos\frac{\alpha-\beta}{2}$ is

(a) $-\frac{3}{\sqrt{130}}$ (b) $\frac{3}{\sqrt{130}}$

(c) $\frac{6}{65}$ (d) $-\frac{6}{65}$

73. If $\alpha = \frac{\pi}{14}$, then the value of $(\tan\alpha\tan 2\alpha + \tan 2\alpha\tan 4\alpha + \tan 4\alpha\tan\alpha)$ is

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

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

74. If $2\sec 2\alpha = \tan\beta + \cot\beta$, then one of the values of $\alpha + \beta$ is

(a) $\frac{\pi}{4}$ (b) $\frac{\pi}{2}$

(c) π (d) 2π

75. $sin^2(3°) + sin^2(6°) + sin^2(9°) + \cdots sin^2(84°) + sin^2(87°) + sin^2(90°) =$

(a) $\frac{31}{2}$ (b) $\frac{39}{2}$

(c) $\frac{59}{2}$ (d) 36

76. $\frac{\sqrt{3}}{\sin(20°)} - \frac{1}{\cos(20°)} =$

(a) 2 (b) $\frac{2\sin 20°}{\sin 40°}$

(c) 4 (d) $\frac{4\sin 20°}{\sin 40°}$

77. If α is a root of $25cos^2\theta + 5\cos\theta - 12 = 0$ and $\frac{\pi}{2} < \alpha < \pi$, then $\sin 2\alpha$ is equal to

(a) $\frac{24}{25}$ (b) $\frac{-24}{25}$

(c) $\frac{13}{18}$ (d) $\frac{-13}{18}$

78. If $cosec\,\theta = \frac{p+q}{p-q}$, then $\cot\left(\frac{\pi}{4} + \frac{\theta}{2}\right) =$

(a) $\sqrt{\frac{p}{q}}$ (b) $\sqrt{\frac{q}{p}}$

(c) $\sqrt{pq}$ (d) pq

79. If $90° < A < 180°$ and $\sin A = \frac{4}{5}$, then $\tan\frac{A}{2}$ is equal to

(a) $\frac{1}{2}$ (b) $\frac{3}{5}$

(c) $\frac{3}{2}$ (d) 2

80. If θ is an acute angle and $\sin\frac{\theta}{2} = \sqrt{\frac{x-1}{2x}}$, then $\tan\theta$ is equal to

(a) $x^2 - 1$ (b) $\sqrt{x^2 - 1}$

(c) $\sqrt{x^2 + 1}$ (d) $x^2 + 1$

81. If $\cos A = \frac{3}{4}$ then value of $32\sin\left(\frac{A}{2}\right)\sin\left(\frac{5A}{2}\right)$ is equal to

(a) $\sqrt{11}$ (b) $-\sqrt{11}$

(c) 11 (d) -11

82. If $\sin x + \cos y = a$ and $\cos x + \sin y = b$, then $\tan\frac{x-y}{2}$ is equal to

(a) $a + b$ (b) $a - b$

(c) $\frac{a+b}{a-b}$ (d) $\frac{a-b}{a+b}$

83. If $2\tan\alpha + \cot\beta = \tan\beta$, then the value of $\tan(\beta - \alpha)$ is

(a) $\tan\alpha$ (b) $\cot\alpha$

(c) $\tan\beta$ (d) $\cot\beta$

84. $\cos\frac{2\pi}{15}\cos\frac{4\pi}{15}\cos\frac{8\pi}{15}\cos\frac{16\pi}{15} =$

a) $\frac{1}{2}$ b) $\frac{1}{4}$

c) $\frac{1}{8}$ d) $\frac{1}{16}$

85. In any triangle ABC, $sin^2A - sin^2B + sin^2C$ is always equal to

(a) $2\sin A\sin B\cos C$ (b) $2\sin A\cos B\sin C$

(c) $2\sin A\cos B\cos C$ (d) $2\sin A\sin B\sin C$

86. If $\sin\theta = \frac{12}{13}$, $\left(0 < \theta < \frac{\pi}{2}\right)$ and $\cos\emptyset = -\frac{3}{5}$, $\left(\pi < \emptyset < \frac{3\pi}{2}\right)$, then $\sin(\theta + \emptyset)$ will be

(a) $\frac{-56}{61}$ (b) $\frac{-56}{65}$

(c) $\frac{1}{65}$ (d) -56

87. If $\frac{\pi}{2} < \alpha < \pi$, $\pi < \beta < \frac{3\pi}{2}$; $\sin\alpha = \frac{15}{17}$ and $\tan\beta = \frac{12}{5}$, then the value of $\sin(\beta - \alpha)$ is

(a) $\frac{-171}{221}$ (b) $\frac{-21}{221}$

(c) $\frac{21}{221}$ (d) $\frac{171}{221}$

88. If $f_k(x) = \frac{1}{k}(sin^kx + cos^kx)$ where $x \in R$, $k \geq 1$ then $f_4(x) - f_6(x) =$

(a) $\frac{1}{6}$ (b) $\frac{1}{3}$

(c) $\frac{1}{9}$ (d) $\frac{1}{12}$

89. The expression $\frac{\tan A}{1-\cot A} + \frac{\cot A}{1-\tan A}$ can be written as

(a) $\sin A\cos A + 1$ (b) $\sec A\ cosec\ A + 1$

(c) $\tan A + \cot A$ (d) $\sec A + cosec\ A$

90. In a ΔPQR, if $3\sin P + 4\cos Q = 6$ and $4\sin Q + 3\cos P = 1$ then the acute angle 'R' is equal to

(a) $\frac{\pi}{4}$ (b) $\frac{3\pi}{4}$

(c) $\frac{5\pi}{6}$ (d) $\frac{\pi}{6}$

91. Which of the following is correct?

(a) $\sin 1^\circ > \sin 1$ (b) $\sin 1^\circ < \sin 1$

(c) $\sin 1^\circ = \sin 1$ (d) $\sin 1^\circ = \frac{\pi}{180}\sin 1$

92. $cos^2 5^\circ + cos^2 10^\circ + cos^2 15^\circ + \cdots + cos^2 360^\circ =$

(a) 18 (b) 27

(c) 36 (d) 45

93. If $x = a\,cos^2\theta \sin\theta$ and $y = a\,sin^2\theta \cos\theta$, then $\frac{(x^2+y^2)^3}{x^2y^2} =$

(a) a (b) a^3

(c) a^2 (d) a^5

94. $a\sec\theta + b\tan\theta = 1$, $a\sec\theta - b\tan\theta = 5 \Rightarrow a^2(b^2+4) =$

(a) $3b^2$ (b) $9b^2$

(c) b^2 (d) $4b^2$

95. If α and β are acute such that $\tan(\alpha+\beta)$ and $\tan(\alpha-\beta)$ satisfy the equation $x^2 - 4x + 1 = 0$, then (α, β)

(a) $\left(30^\circ, 60^\circ\right)$ (b) $\left(45^\circ, 45^\circ\right)$

(c) $\left(45^\circ, 30^\circ\right)$ (d) $\left(60^\circ, 45^\circ\right)$

96. If $\frac{\cos x}{a} = \frac{\sin x}{b}$ then $|a\cos 2x + b\sin 2x|$ is equal to

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

(c) $\frac{b^2}{|a|}$ (d) None of these

97. If $tan^2 x + \sec x - a = 0$, has at least one solution then, complete set of values of $'a'$ is

(a) $(-\infty, 1]$ (b) $(-\infty, 1]$

(c) $[-1, 1]$ (d) $[-1, \infty)$

98. The least value of $3sin^2\theta + 4cos^2\theta$ is

(a) 2 (b) 3

(c) 0 (d) 1

99. If $A = sin^2 x + cos^4 x$, then for all real x

(a) $\frac{13}{16} \le A \le 1$ (b) $1 \le A \le 2$

(c) $\frac{3}{4} \le A \le \frac{13}{16}$ (d) $\frac{3}{4} \le A \le 1$

100. The maximum value of $f(x) = \sin x\,(1 + \cos x)$ is

(a) $\frac{3\sqrt{3}}{4}$ (b) $\frac{3\sqrt{3}}{2}$

(c) $3\sqrt{3}$ (d) $\sqrt{3}$

101. If $P = \frac{1}{2}sin^2\theta + \frac{1}{3}cos^2\theta$, then

(a) $\frac{1}{3} \le P \le \frac{1}{2}$ (b) $P \ge \frac{1}{2}$

(c) $2 \le P \le 3$ (d) $-\frac{\sqrt{13}}{6} \le P \le \frac{\sqrt{13}}{6}$

102. If $\sin A + \cos A = m$ and $sin^3 A + cos^3 A = n$, then

(a) $m^3 - 3m + n = 0$

(b) $n^3 - 3n + 2m = 0$

(c) $m^3 - 3m + 2n = 0$

(d) $m^3 + 3m + 2n = 0$

103. The value of $\cos 480° \sin 150° + \sin 600° \cos 390°$ is

(a) 0 (b) 1

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

104. $sec^2\theta = \frac{4xy}{(x+y)^2}$ is true, if and only if

(a) $x + y \neq 0$ (b) $x = y, x \neq 0, y \neq 0$

(c) $x = y$ (d) $x \neq 0, y \neq 0$

105. If $\alpha + \beta + \gamma = \pi$, then $sin^2\alpha + sin^2\beta - sin^2\gamma$ is equal to

(a) $2\sin\alpha\sin\beta\cos\gamma$

(b) $2\cos\alpha\cos\beta\cos\gamma$

(c) $2\sin\alpha\sin\beta\sin\gamma$

(d) None of these

106. The maximum value of $4\sin^2 x - 12\sin x + 7$ is

(a) 25 (b) 4

(c) does not exist (d) None of these

107. If $A + B + C = \pi$, then $\sin 2A + \sin 2B + \sin 2C$ is equal to

(a) $4\sin A \sin B \sin C$ (b) $4\cos A \cos B \cos C$

(c) $2\cos A \cos B \cos C$ (d) $2\sin A \sin B \sin C$

108. The minimum value of $f(x) = sin^4 x + cos^4 x, 0 \le x \le \frac{\pi}{2}$ is

(a) $\frac{1}{2\sqrt{2}}$ (b) $\frac{1}{4}$

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

109. If $12\,cot^2\theta - 31\,cosec\,\theta + 32 = 0$, then the value of $\sin\theta$ is

(a) $\frac{3}{4}$ or 1 (b) $\frac{2}{3}$ or $-\frac{2}{3}$

(c) $\frac{4}{5}$ or $\frac{3}{4}$ (d) $\pm\frac{1}{2}$

110. The expression $\frac{1}{\tan 3A - \tan A} - \frac{1}{\cot 3A - \cot A}$ equals

(a) $\cot 2A$ (b) $\tan 2A$

(c) $\cot 3A$ (d) $\tan 3A$

111. The value of $\cos 15^\circ - \sin 15^\circ$ is equal to

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

(c) $-\frac{1}{\sqrt{2}}$ (d) 0

112. The value of $cos^4\left(\frac{\pi}{8}\right) + cos^4\left(\frac{3\pi}{8}\right) + cos^4\left(\frac{5\pi}{8}\right) + cos^4\left(\frac{7\pi}{8}\right)$ is

(a) 0 (b) $\frac{1}{2}$

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

113. $\log\tan 17^\circ + \log\tan 37^\circ + \log\tan 53^\circ + \log\tan 73^\circ =$

(a) 0 (b) 1

(c) 2 (d) 3

114. $\sin 10^\circ + \sin 20^\circ + \sin 30^\circ + \cdots + \sin 360^\circ =$

(a) 0 (b) -1

(c) 1 (d) 2

115. $8sin^2 x + 3cos^2 x = 5 \Rightarrow \cot x$

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

(c) $\pm\sqrt{\frac{3}{2}}$ (d) $\pm\sqrt{\frac{2}{3}}$

116. $sin^2\frac{\pi}{18} + sin^2\frac{2\pi}{18} + sin^2\frac{4\pi}{18} + sin^2\frac{8\pi}{18} + sin^2\frac{7\pi}{18} + sin^2\frac{5\pi}{18} =$

(a) 1 (b) 2

(c) 3 (d) 4

117. If $\tan\alpha + \cot\alpha = 2$ then $\sqrt{\tan\alpha} + \sqrt{\cot\alpha} =$

(a) $\sqrt{2}$ (b) $2\sqrt{2}$

(c) 2 (d) $4\sqrt{2}$

118. If $k = (\sec A + \tan A)(\sec B + \tan B)(\sec C + \tan C) = (\sec A - \tan A)(\sec B - \tan B)(\sec C - \tan C)$ then $k =$

(a) 0 (b) ± 1

(c) ± 3 (d) ± 4

119. If $\sin\theta$ and $\cos\theta$ are the roots of $px^2 + qx + r = 0$ then $q^2 - p^2 =$

(a) 0 (b) $-2pr$

(c) $2qr$ (d) $2rp$

120. If $0 \le x \le \pi$, $4^{sin^2 x} + 4^{cos^2 x} = 5$, then $x =$

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{3}$

(c) $\frac{\pi}{4}$ (d) $\frac{\pi}{2}$

121. $tan^2\alpha = 1 - p^2$, then $\sec\alpha + tan^2\alpha\, cosec\,\alpha =$

(a) $(2 + p^2)^{\frac{3}{2}}$ (b) $(1 + p^2)^{\frac{3}{2}}$

(c) $(2 - p^2)^{\frac{3}{2}}$ (d) $(1 - p^2)^{\frac{3}{2}}$

122. If $\cos(A - B) = \frac{3}{5}$ and $\tan A \tan B = 2$, then

(a) $\cos A \cos B = \frac{1}{5}$ (b) $\sin A \sin B = -\frac{2}{5}$

(c) $\cos A \cos B = -\frac{1}{5}$ (d) $\sin A \sin B = -\frac{1}{5}$

123. If $A = \sin 45° + \cos 45°$ and $B = \sin 44° + \cos 44°$, then

(a) $A > B$ (b) $A < B$

(c) $A = B$ (d) None of these

124. Let $\frac{\sin(\theta-\alpha)}{\sin(\theta-\beta)} = \frac{a}{b}$ and $\frac{\cos(\theta-\alpha)}{\cos(\theta-\beta)} = \frac{c}{d}$ then $\frac{ac+bd}{ad+bc} =$

(a) $\cos(\alpha - \beta)$ (b) $\sin(\alpha - \beta)$

(c) $\sin(\alpha + \beta)$ (d) None of these

125. If $\cos\alpha + \cos\beta = 0 = \sin\alpha + \sin\beta$, then $\cos 2\alpha + \cos 2\beta$ is equal to

(a) $-2\sin(\alpha + \beta)$ (b) $-2\cos(\alpha + \beta)$

(c) $2\sin(\alpha + \beta)$ (d) $2\cos(\alpha + \beta)$

126. Value of $\frac{3+\cot 80° \cot 20°}{\cot 80° + \cot 20°}$ is equal to

(a) $\cot 20°$ (b) $\tan 50°$

(c) $\cot 20°$ (d) $\cot\sqrt{20°}$

127. If $\sin\theta_1 - \sin\theta_2 = a$ and $\cos\theta_1 + \cos\theta_2 = b$, then

(a) $a^2 + b^2 \geq 4$ (b) $a^2 + b^2 \leq 4$

(c) $a^2 + b^2 3 \geq$ (d) $a^2 + b^2 \leq 2$

128. Let $A = sin^8\theta + cos^{14}\theta$; then for all real θ

(a) $A \geq 1$ (b) $0 < A \leq 1$

(c) $\frac{1}{2} < A \leq \frac{3}{2}$ (d) None of these

129. Minimum value $y = 256\, sin^2 x + 324\, cosec^2 x \;\forall\; x \,\epsilon R$ of is

(a) 432 (b) 504

(c) 576 (d) 776

130. $(1 + \tan\alpha \tan\beta)^2 + (\tan\alpha - \tan\beta)^2 =$

(a) $tan^2\alpha\, tan^2\beta$ (b) $sec^2\alpha\, sec^2\beta$

(c) $tan^2\alpha\, cot^2\beta$ (d) $sec^2\alpha\, cos^2\beta$

131. If $\frac{x}{\cos\theta} = \frac{y}{\cos\left(\theta-\frac{2\pi}{3}\right)} = \frac{z}{\cos\left(\theta+\frac{2\pi}{3}\right)}$, then $x + y + z$ is

(a) 1 (b) 0

(c) -1 (d) None of these

132. If $\theta = \frac{11\pi}{6}$, then $\cos\theta + \sin\theta =$

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

(c) $\frac{\sqrt{3}-1}{2}$ (d) $\frac{\sqrt{3}+1}{2}$

133. If $\sin\theta + \cos\theta = p$ and $sin^3\theta + cos^3\theta = q$ then $p(p^2 - 3) =$

(a) q (b) $2q$

(c) $-q$ (d) $-2q$

134. If $0 \leq x \leq \pi$, $81^{sin^2 x} + 81^{cos^2 x} = 30$ then $x =$

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{4}$

(c) $\frac{\pi}{15}$ (d) $\frac{\pi}{8}$

135. If $\tan A . \tan B = \frac{1}{2}$, then $(5 - 3\cos 2A)(5 - 3\cos 2B) =$

(a) 2 (b) 8

(c) 12 (d) 18

136. If $\frac{3-tan^2\frac{\pi}{7}}{1-tan^2\frac{\pi}{7}} = k\cos\frac{\pi}{7}$ then the value of k is

(a) 1 (b) 2

(c) 3 (d) 4

137. If $\tan\theta = \sqrt{n}$, where $n \,\epsilon\, N$, ≥ 2, then $\sec 2\theta$ is always

(a) a rational number

(b) an irrational number

(c) a positive integer

(d) a negative integer

138. $sin^2\alpha + cos^2(\alpha + \beta) + 2\sin\alpha \sin\beta \cos(\alpha + \beta)$ is independent of

(a) α (b) β

(c) both α and β (d) None of these

139. The value of $\cos 12° + \cos 84° + \cos 156° + \cos 132°$ is

(a) $\frac{1}{8}$ (b) $-\frac{1}{2}$

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

140. If $\cos\theta = \cos\alpha\cos\beta$, then $\tan\frac{\theta+\alpha}{2}\tan\frac{\theta-\alpha}{2}$ is equal to

(a) $tan^2\left(\frac{\alpha}{2}\right)$ (b) $tan^2\left(\frac{\beta}{2}\right)$

(c) $tan^2\left(\frac{\theta}{2}\right)$ (d) $cot^2\left(\frac{\beta}{2}\right)$

141. If $\sin 2\theta = \cos 3\theta$ and θ is an acute angle, then $\sin\theta$ equals

(a) $\frac{\sqrt{5}-1}{4}$ (b) $-\left(\frac{\sqrt{5}-1}{4}\right)$

(c) $\frac{\sqrt{5}+1}{4}$ (d) $\frac{-\sqrt{5}-1}{4}$

142. If $\sin x + \cos x = \frac{\sqrt{17}}{2}$, where $x \epsilon 1^{st}$ quadrant, then $\tan\frac{x}{2}$ is equal to

(a) $\frac{3-\sqrt{7}}{3}$ (b) $\frac{\sqrt{7}-2}{3}$

(c) $\frac{4-\sqrt{7}}{4}$ (d) None of these

143. If $\frac{\tan 3A}{\tan A} = k$ $(k \neq 1)$ then which of the following is not true?

(a) $\frac{\cos A}{\cos 3A} = \frac{k-1}{2}$ (b) $\frac{\sin 3A}{\sin A} = \frac{2k}{k-1}$

(c) $\frac{\cot 3A}{\cot A} = \frac{1}{k}$ (d) None of these

144. If $\tan\theta$, $2\tan\theta + 2$, $3\tan\theta + 3$ are in GP then the value of $\frac{7-5\cot\theta}{9-4\sqrt{sec^2\theta-1}}$ is

(a) $\frac{12}{5}$ (b) $\frac{-33}{28}$

(c) $\frac{33}{100}$ (d) $\frac{12}{13}$

145. In a triangle ABC, $C = 90^\circ$, then the equation whose roots are $\tan A$, $\tan B$ is

(a) $abx^2 + c^2x + ab = 0$

(b) $abx^2 + c^2x - ab = 0$

(c) $abx^2 - c^2x - ab = 0$

(d) $abx^2 - c^2x + ab = 0$

146. $\tan A = a\tan B$, $\sin A = b\sin B \Rightarrow \frac{b^2-1}{a^2-1} =$

(a) sin^2A (b) sin^3A

(c) cos^2A (d) cos^3A

147. If $\cos\alpha + \cos\beta = a$, $\sin\alpha + \sin\beta = b$ and $\alpha - \beta = 2\theta$, then $\frac{\cos 3\theta}{\cos\theta} =$

(a) $a^2 + b^2 - 2$ (b) $a^2 + b^2 - 3$

(c) $3 - a^2 - b^2$ (d) $\frac{(a^2+b^2)}{4}$

148. The solution set of the equation $\tan(\pi\tan x) = \cot(\pi\cot x)$ is

(a) $\{0\}$ (b) $\left\{\frac{\pi}{4}\right\}$

(c) $\emptyset$ (d) None of these

149. $\frac{\tan A}{1+\sec A} + \frac{1+\sec A}{\tan A}$ is equal to

(a) $2\sin A$ (b) $2\cos A$

(c) $2\,cosec\,A$ (d) $2\sec A$

150. $\cos 1° + \cos 2° + \cos 3° + \cdots + \cos 180°$ is equal to

(a) 1 (b) 0

(c) 2 (d) -1

151. If $\cos A = m\cos B$ and $\cot\left(\frac{A+B}{2}\right) = \lambda.\tan\left(\frac{B-A}{2}\right)$ then λ is equal to

(a) $\frac{m}{m-1}$ (b) $\frac{m+1}{m}$

(c) $\frac{m+1}{m-1}$ (d) None of these

152. The maximum value of $5\cos\theta + 3\cos\left(\theta + \frac{\pi}{3}\right) + 3$ is

(a) 5 (b) 11

(c) 10 (d) -1

153. If $5\cos x + 12\cos y = 13$, then the maximum value $5\sin x + 12\sin y$ is

(a) 12 (b) $\sqrt{120}$

(c) $\sqrt{20}$ (d) 13

154. The maximum value of the function $3\cos x - 4\sin x$ is

(a) 2 (b) 3

(c) 4 (d) 5

155. If $\sin\theta + \cos\theta = a$, then $sin^4\theta + cos^4\theta =$

(a) $1 - \frac{1}{2}(a^2+1)^2$ (b) $1 - \frac{1}{2}(a^2-1)^2$

(c) $1 + \frac{1}{2}(a^2+1)^2$ (d) $1 + \frac{1}{2}(a^2-1)^2$

156. If $\sec\theta + \cos\theta = 2$ then $sin^2\theta + tan^2\theta =$

(a) 0 (b) 1

(c) 2 (d) 4

157. If $e^{(1+sin^2x+sin^4x+\cdots\infty)\log 2} = 16$, then $tan^2x =$

(a) 1 (b) 2

(c) 3 (d) 4

158. If x, y, z are in AP, then $\frac{\sin x - \sin z}{\cos z - \cos x}$ is equal to

(a) $\tan y$ (b) $\cot y$

(c) $\sin y$ (d) $\cos y$

159. $\frac{\sqrt{2} - \sin\alpha - \cos\alpha}{\sin\alpha - \cos\alpha}$ is equal to

(a) $\sec\left(\frac{\alpha}{2} - \frac{\pi}{8}\right)$ (b) $\cos\left(\frac{\pi}{8} - \frac{\alpha}{2}\right)$

(c) $\tan\left(\frac{\alpha}{2} - \frac{\pi}{8}\right)$ (d) $\cot\left(\frac{\alpha}{2} - \frac{\pi}{2}\right)$

160. If $\sin(y+z-x)$, $\sin(z+x-y)$, $\sin(x+y-z)$ are in AP, then $\tan x$, $\tan y$, $\tan x$ are in

(a) AP (b) GP

(c) HP (d) None of these

161. If $x + \frac{1}{x} = 2\cos\alpha$, then $x^n + \frac{1}{x^n} =$

(a) $2^n \cos\alpha$ (b) $2^n \cos n\alpha$

(c) $2i \sin n\alpha$ (d) $2\cos n\alpha$

162. If $\sin 2\theta + \sin 2\emptyset = \frac{1}{2}$ and $\cos 2\theta + \cos 2\emptyset = \frac{3}{2}$, then $cos^2(\theta - \emptyset) =$

(a) $\frac{3}{8}$ (b) $\frac{5}{8}$

(c) $\frac{3}{4}$ (d) $\frac{5}{4}$

163. $\cos 2\alpha = \frac{3\cos 2\beta - 1}{3 - \cos 2\beta}$, then $\tan\alpha =$

(a) $\sqrt{2}\tan\beta$ (b) $\frac{\tan\beta}{\sqrt{2}}$

(c) $\frac{tan^2\beta}{\sqrt{2}}$ (d) $\tan\beta$

164. $2\sin A\ cos^3A - 2\ sin^3A\cos A =$

(a) $\sin 4A$ (b) $\frac{1}{2}\sin 4A$

(c) $\frac{1}{4}\sin 4A$ (d) $\frac{1}{8}\sin 4A$

165. If A, B, C are angles of a triangle such that A is obtuse then

(a) $\tan A \tan B > 1$ (b) $\tan B \tan C < 1$

(c) $\tan C \tan A > 1$ (d) $\tan A \tan B \tan C > 1$

166. If $\frac{cos^2\theta}{a} = \frac{sin^2\theta}{b}$ then $\frac{cos^4\theta}{a} = \frac{sin^4\theta}{b} =$

(a) $\frac{1}{a+b}$ (b) $\frac{1}{(a+b)^2}$

(c) $\frac{1}{a^2} + \frac{1}{b^2}$ (d) $a + b$

167. $cos^4\alpha - sin^4\alpha = a$ then $\frac{1-a}{1+a} =$

(a) $tan^2\alpha$ (b) $cot^2\alpha$

(c) $-tan^2\alpha$ (d) $-cot^2\alpha$

168. $a = \frac{1+\sin x}{1-\cos x+\sin x} \Rightarrow \frac{1+\cos x+\sin x}{2\sin x}$

(a) a (b) $\frac{1}{a}$

(c) a^2 (d) $\frac{1}{a^2}$

169. If $sin^2\theta = \frac{x^2+y^2+1}{2x}$, then x must be

(a) -3 (b) -2

(c) 1 (d) None of these

170. If $\sin\theta + cosec\,\theta = 2$, the value of $sin^{10}\theta + cosec^{10}\theta$ is

(a) 2 (b) 2^{10}

(c) 2^9 (d) 10

171. If $A = 130^0$ and $x = \sin A + \cos A$, then

(a) $x > 0$ (b) $x < 0$

(c) $x = 0$ (d) $x \geq 0$

172. If $\frac{3\pi}{4} < a < \pi$, then $\sqrt{cosec^2\alpha + 2\cot\alpha}$

(a) $1 + \cot\alpha$ (b) $1 - \cot\alpha$

(c) $-1 - \cot\alpha$ (d) $-1 + \cot\alpha$

173. If $\tan x = \frac{3}{4}$, $\pi < x < \frac{3\pi}{2}$ then the value of $\cos\frac{x}{2}$ is

(a) $-\frac{1}{\sqrt{10}}$ (b) $\frac{3}{\sqrt{10}}$

(c) $\frac{1}{\sqrt{10}}$ (d) $-\frac{3}{\sqrt{10}}$

174. The value of $\cos 15° \cos 7\frac{1}{2}° \sin 7\frac{1}{2}°$ is

(a) $\frac{1}{2}$ (b) $\frac{1}{8}$

(c) $\frac{1}{4}$ (d) $\frac{1}{16}$

175. The value of expression $\frac{1}{\cos 290°} + \frac{1}{\sqrt{3}\sin 250°}$ is

(a) $\frac{\sqrt{3}}{4}$ (b) $\frac{4}{\sqrt{3}}$

(c) $\frac{2}{\sqrt{3}}$ (d) $\frac{\sqrt{3}}{2}$

176. If $\sec\theta + \tan\theta = p$, then $\tan\theta$ is equal to

(a) $\frac{2p}{p^2-1}$ (b) $\frac{p^2-1}{2p}$

(c) $\frac{p^2+1}{2p}$ (d) $\frac{2p}{p^2+1}$

177. $5\sin x + 4\cos x = 3 \Rightarrow 4\sin x - 5\cos x =$

(a) 4 (b) $4\sqrt{2}$

(c) $3\sqrt{2}$ (d) $\sqrt{2}$

178. Which one of the following is possible?

(a) $\sin\theta = \frac{a^2+b^2}{a^2-b^2}, (a \neq b)$

(b) $\sec\theta = \frac{4}{5}$

(c) $\tan\theta = 45$

(d) $\cos\theta = \frac{7}{3}$

179. $\log\sin 1^\circ . \log\sin 2^\circ \ldots . \log\sin 179^\circ$

(a) 0 (b) 0

(c) -1 (d) 2

180. If θ lies in the first quadrant and $5\tan\theta = 4$, then $\frac{5\sin\theta - 3\cos\theta}{\sin\theta + 2\cos\theta} =$

(a) $\frac{5}{14}$ (b) $\frac{3}{14}$

(c) $\frac{1}{14}$ (d) 0

181. If $a\,sin^2\theta + b\,cos^2\theta = c$, then $tan^2\theta =$

(a) $\frac{b-c}{a-c}$ (b) $\frac{c-b}{a-c}$

(c) $\frac{a-c}{b-c}$ (d) $\frac{a-c}{c-b}$

182. $\sin 4530^\circ =$

(a) $\frac{1}{2}$ (b) $-\frac{1}{2}$

(c) $\frac{\sqrt{3}}{2}$ (d) $-\frac{\sqrt{3}}{2}$

183. The value of $\tan 20° + 2\tan 50° - \tan 70°$ is

(a) 1 (b) 0

(c) $\tan 50°$ (d) None of these

184. $\sin 12° \sin 48° \sin 54°$ is equal to

(a) $\frac{1}{16}$ (b) $\frac{1}{32}$

(c) $\frac{1}{8}$ (d) $\frac{1}{4}$

185. If $\tan\theta + \tan\left(\theta + \frac{\pi}{3}\right) + \tan\left(\theta + \frac{2\pi}{3}\right) = 3$, then which of the following is equal to1?

(a) $\tan 2\theta$ (b) $\tan 3\theta$

(c) $tan^2\theta$ (d) $tan^3\theta$

186. If $\frac{\sin x}{\sin y} = \frac{1}{2}$, $\frac{\cos x}{\cos y} = \frac{3}{2}$, where x, $y \in \left(0, \frac{\pi}{2}\right)$, then value of $\tan(x + y)$ is equal to

(a) $\sqrt{13}$ (b) $\sqrt{14}$

(c) $\sqrt{17}$ (d) $\sqrt{15}$

187. If $\cos(\alpha - \beta) = 3\sin(\alpha + \beta)$, then $\frac{1}{1-3\sin 2\alpha} + \frac{1}{1-3\sin 2\beta} =$

(a) $\frac{1}{2}$ (b) $\frac{-1}{2}$

(c) $\frac{1}{4}$ (d) $\frac{-1}{4}$

188. The value of $cos^2 10° - \cos 10° \cos 50° + cos^2 50°$ is equal to

(a) $\frac{4}{3}$ (b) $\frac{1}{3}$

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

189. If $tan^2\theta = 2tan^2\emptyset + 1$, then $\cos 2\theta + sin^2\emptyset$ equals

(a) -1 (b) 0

(c) 1 (d) None of these

190. If $x\, sin^3\theta + ycos^3\theta = \sin\theta \cos\theta$ and $x \sin\theta = y \cos\theta$ then $x^2 + y^2$ is equal to

(a) 2 (b) 0

(c) 3 (d) 1

191. If $\sin\theta = 3\sin(\theta + 2\alpha)$, then the value of $\tan(\theta + \alpha) + 2\tan\alpha$ is

(a) 3 (b) 2

(c) -1 (d) 0

192. If $\alpha, \beta \in \left(0, \frac{\pi}{2}\right)$, $\sin\alpha = \frac{4}{5}$ and $\cos(\alpha + \beta) = -\frac{12}{13}$, then $\sin\beta$ is equal to

(a) $\frac{63}{65}$ (b) $\frac{61}{65}$

(c) $\frac{3}{5}$ (d) $\frac{5}{13}$

193. If $\cos A = \cos B \cos C$ and $A + B + C = \pi$, then the value of $\cot B \cot C$ is

(a) 1 (b) 2

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

194. If $x = X\cos\theta - Y\sin\theta$, $y = X\sin\theta + Y\cos\theta$ and $x^2 + 4xy + y^2 = AX^2 + BY^2$, $0 \le \theta \le \frac{\pi}{2}$, then

(a) $\theta = \frac{\pi}{6}, A = 4$ (b) $\theta = \frac{\pi}{4}, A = 3$

(c) $A = 3, \pi = \frac{\pi}{3}$ (d) None of these

195. If $0 < x < \frac{\pi}{2}$ and $sin^n x + cos^n x \ge 1$, $n \in R$, then

(a) $2 \le n \le \infty$ (b) $-\infty < n \le 2$

(c) $-1 \le n \le 2$ (d) None of these

196. If $\sin(\alpha + \beta) = 1, \sin(\alpha - \beta) = \frac{1}{2}$ then $\tan(\alpha + 2\beta)\tan(2\alpha + \beta) =$

(a) 1 (b) -1

(c) 0 (d) 2

197. $2\, cos^2 B - 1 = tan^2 A$, then $\cos A \cos B =$

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

(c) $\pm\frac{1}{\sqrt{2}}$ (d) ± 1

198. Which of the following is not possible?

(a) $\sin\theta = \frac{5}{7}$ (b) $\cos\theta = \frac{1+a^2}{1-a^2}, |a| \ne 1$

(c) $\tan\theta = 100$ (d) $\sec\theta = \frac{5}{2}$

199. If $5\left(tan^2 x - cos^2 x\right) = 2\cos 2x + 9$, then the value of $\cos 4x$ is

(a) $-\frac{7}{9}$ (b) $-\frac{3}{5}$

(c) $\frac{1}{3}$ (d) $\frac{2}{9}$

200. The value of $\frac{\cot x - \tan x}{\cot 2x}$ is

(a) 1 (b) 2

(c) -1 (d) 4

201. If $0 < \theta < \frac{\pi}{2}$, and $f(\theta) = (1 + \cot\theta - cosec\,\theta)(1 + \tan\theta + \sec\theta)$, then $f\left(\frac{\pi}{4}\right)$ is equal to

(a) 0 (b) 1

(c) 2 (d) $2 + \sqrt{2}$

202. If $\cot A = \tan\left((n-1)A\right)$, where $n \epsilon N$, then a value of A can be

(a) $\frac{\pi}{2n}$ (b) $\frac{\pi}{n}$

(c) $\frac{2\pi}{n}$ (d) $\frac{\pi}{4n}$

203. If $x = a\cos^2\theta\sin\theta$ and $y = a\sin^2\theta\cos\theta$, then $(x^2+y^2)^3$ is

(a) $\frac{a^2x^2}{y^2}$ (b) $a^2x^2y^2$

(c) $a^2(x^2-y^2)$ (d) None of these

204. The difference between the greatest and least values of the function $f(x) = \cos x + \frac{1}{2}\cos 2x - \frac{1}{3}\cos 3x$ is

(a) $\frac{2}{3}$ (b) $\frac{8}{7}$

(c) $\frac{9}{4}$ (d) $\frac{3}{8}$

205. A, B, C are the angles of a triangle, then $\sin^2A + \sin^2B + \sin^2C - 2\cos A\cos B\cos C$ =

(a) 1 (b) 2

(c) 3 (d) 4

206. For all values of θ, the value $3 - \cos\theta + \cos\left(\theta + \frac{\pi}{3}\right)$ lies in the interval

(a) $[-2,3]$ (b) $[-2,1]$

(c) $[2,4]$ (d) $[1,5]$

207. ΔABC is right angled at C, then $\tan A + \tan B$ is equal to

(a) $\frac{b^2}{ac}$ (b) $a+b$

(c) $\frac{a^3}{bc}$ (d) $\frac{c^2}{ab}$

208. The value of $\tan 1^0 \tan 2^0 \tan 3^0 \ldots \tan 89^0$ is equal to

(a) -1 (b) 2

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

209. If $\sin A = \sin^2 B$ and $2\cos^2 A = 3\cos^2 B$ then the triangle ABC is

(a) right angled (b) obtuse angled

(c) isosceles (d) equilateral

210. The value of $\cos\frac{\pi}{7} + \cos\frac{2\pi}{7} + \cos\frac{3\pi}{7} + \cos\frac{4\pi}{7} + \cos\frac{5\pi}{7} + \cos\frac{6\pi}{7}\cos\frac{7\pi}{7}$ is

(a) 1 (b) -1

(c) 0 (d) None of these

211. The value of the expression $(2\sin^2 91^\circ - 1)(2\sin^2 92^\circ - 1)\ldots(2\sin^2 180^\circ - 1)$ is equal to

(a) 0 (b) 1

(c) 2^{90} (d) $2^{90} - 90$

212. Given then $\cos\left(\frac{\alpha-\beta}{2}\right) = 2\cos\left(\frac{\alpha+\beta}{2}\right)$, then $\tan\frac{\alpha}{2}\tan\frac{\beta}{2}$ is equal to

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

(c) $\frac{1}{4}$ (d) $\frac{1}{8}$

213. If $\tan(A+B) = p$, $\tan(A-B) = q$, then the value of $\tan 2A$ in terms of p and q is

(a) $\frac{p+q}{p-q}$ (b) $\frac{p-q}{1+pq}$

(c) $\frac{p+q}{1-pq}$ (d) $\frac{1+pq}{1-q}$

214. If $\cos(\alpha+\beta) = \frac{3}{5}$, $\sin(\alpha-\beta) = \frac{5}{13}$ and $0 < \alpha, \beta < \frac{\pi}{4}$, then $\tan(2\alpha)$ is equal to

(a) $\frac{63}{52}$ (b) $\frac{63}{16}$

(c) $\frac{21}{16}$ (d) $\frac{33}{52}$

215. $\log(\tan 1^\circ)\log(\tan 2^\circ)\log(\tan 3^\circ)\ldots\log(\tan 45^\circ) =$

(a) 0 (b) 1

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

216. $\operatorname{cosec}^2\alpha = \frac{4xy}{(x+y)^2}$ $[(x,y) \neq (0,0)]$ is

(a) Possible for $x = y$

(b) Impossible for $x = y$

(c) Possible for $x = -y$

(d) Not possible

217. If $a\sin^3 x + b\cos^3 x = \sin x\cos x$ and $a\sin x = b\cos x$ then $a^2 + b^2 =$

(a) 0 (b) 1

(c) 2 (d) 3

218. If $a\sin^2 x + b\cos^2 x = c$, $b\sin^2 y + a\cos^2 y = d$ and $a\tan x = b\tan y$ then $\frac{a^2}{b^2} =$

(a) $\frac{(a-d)(c-a)}{(b-c)(d-b)}$ (b) $\frac{(b-c)(b-d)}{(a-c)(a-d)}$

(c) $\frac{(b-c)(d-b)}{(a-d)(c-a)}$ (d) $\frac{(d-a)(c-a)}{(b-c)(d-b)}$

219. If $\sin A + \sin B = \sqrt{3}(\cos B - \cos A)$, then $\sin 3A + \sin 3B$ is equal to

(a) 0 (b) 2

(c) 1 (d) -1

220. The value of $\cos^2\left(\frac{\pi}{4}+\theta\right) - \sin^2\left(\frac{\pi}{4}-\theta\right)$ is

(a) 0 (b) $\cos 2\theta$

(c) $\sin 2\theta$ (d) $\cos\theta$

221. If $\sqrt{\frac{1+\cos A}{1-\cos A}} = \frac{x}{y}$, then the value of $\tan A$ is

(a) $\frac{x^2+y^2}{x^2-y^2}$ (b) $\frac{2xy}{x^2+y^2}$

(c) $\frac{2xy}{x^2-y^2}$ (d) $\frac{2xy}{y^2-x^2}$

222. The minimum value of $a\tan^2 x + b\cot^2 x$ equals the maximum value of $a\sin^2\theta + b\cos^2\theta$ where $a > b > 0$. Then $\frac{a}{b}$ is

(a) 2 (b) 4

(c) 6 (d) 8

223. Range of $f(\theta) = \cos^2\theta(\cos^2\theta + 1) + 2\sin^2\theta$ is

(a) $\left[\frac{3}{4}, 1\right]$ (b) $\left[\frac{3}{16}, 1\right]$

(c) $\left[\frac{3}{4}, \frac{7}{4}\right]$ (d) $\left[\frac{7}{4}, 2\right]$

224. If $0 < \theta < \pi$, then minimum value of $3\sin\theta + \operatorname{cosec}^3\theta$ is

(a) 4 (b) 3

(c) 5 (d) 6

225. $\cos 5^\circ + \cos 24^\circ + \cos 175^\circ + \cos 204^\circ + \cos 300^\circ =$

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

(c) $\frac{3}{2}$ (d) 2

226. $\tan 20^\circ + \tan 40^\circ + \tan 60^\circ + \cdots + \tan 180^\circ =$

(a) 0 (b) 1

(c) 2 (d) 3

227. $(\sin\alpha + \operatorname{cosec}\alpha)^2 + (\sec\alpha + \cos\alpha)^2 = k + \tan^2\alpha + \cot^2\alpha \Rightarrow k =$

(a) 9 (b) 7

(c) 5 (d) 3

228. The value of $\sin\frac{31}{3}\pi$ is

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

(c) $\frac{-\sqrt{3}}{2}$ (d) $\frac{-1}{\sqrt{2}}$

229. At $x = \frac{5\pi}{6}$, the value of $2\sin 3x + 3\cos 3x$ is

(a) 0 (b) 1

(c) -1 (d) None of these

230. $\tan 75° - \cot 75° =$

(a) $2\sqrt{3}$ (b) $2 + \sqrt{3}$

(c) $2 - \sqrt{3}$ (d) $-2\sqrt{3}$

231. The value of $\sin 1° + \sin 2° + \cdots + \sin 359°$ is equal to

(a) 1 (b) 180

(c) 0 (d) -1

232. If $8\cos 2\theta + 8\sec 2\theta = 65$, $0 < \theta < \frac{\pi}{2}$, then the value of $4\cos 4\theta$ is equal to

(a) $-\frac{33}{8}$ (b) $-\frac{31}{8}$

(c) $-\frac{31}{32}$ (d) $-\frac{33}{32}$

233. Let $f(\theta) = (1+\cos\theta)(1+\cos 3\theta)(1+\cos 5\theta)(1+\cos 7\theta)$ then $f\left(-\frac{\pi}{8}\right)$ is equal to:

(a) $-\frac{1}{8}$ (b) $\frac{1}{4}$

(c) $-\frac{1}{4}$ (d) $\frac{1}{8}$

234. If $A+B+C=\frac{3\pi}{2}$, then $\cos 2A+\cos 2B+\cos 2C$ is equal to

(a) $1-4\cos A\cos B\cos C$

(b) $4\sin A+\sin B+\sin C$

(c) $1+2\cos A\cos B\cos C$

(d) $1-4\sin A\sin B\sin C$

235. If $\tan(\alpha-\beta)=\frac{\sin 2\beta}{3-\cos 2\beta}$, then

(a) $\tan\alpha=2\tan\beta$ (b) $\tan\beta=2\tan\alpha$

(c) $2\tan\alpha=3\tan\beta$ (d) $3\tan\alpha=2\tan\beta$

236. $\frac{\cos 9^\circ+\sin 9^\circ}{\cos 9^\circ-\sin 9^\circ}=$

(a) $\tan 54^\circ$ (b) $\tan 36^\circ$

(c) $\tan 18^\circ$ (d) $\tan 9^\circ$

237. If $A-B=\frac{\pi}{4}$, then $(1+\tan A)(1-\tan B)=$

(a) 4 (b) 3

(c) 1 (d) 2

238. If $p=\frac{2\sin\theta}{1+\cos\theta+\sin\theta}$, and $q=\frac{\cos\theta}{1+\sin\theta}$, then

(a) $pq=1$ (b) $\frac{q}{p}=1$

(c) $q-p=1$ (d) $p+q=1$

239. If $\tan\theta-\cot\theta=a$ and $\sin\theta+\cos\theta=b$, then $(b^2-1)^2(a^2+4)$ is equal to

(a) 2 (b) -4

(c) ± 4 (d) 4

240. Minimum value of $\frac{1}{3\sin\theta-4\cos\theta+7}$ is

(a) $\frac{1}{12}$ (b) $\frac{5}{12}$

(c) $\frac{7}{12}$ (d) $\frac{1}{6}$

241. In a triangle ABC the value of $\sin A+\sin B+\sin C$ is

(a) $4\sin\frac{A}{2}\sin\frac{B}{2}\sin\frac{C}{2}$ (b) $4\cos\frac{A}{2}\cos\frac{B}{2}\cos\frac{C}{2}$

(c) $4\cos\frac{A}{2}\sin\frac{B}{2}\sin\frac{C}{2}$ (d) $4\cos\frac{A}{2}\sin\frac{B}{2}\cos\frac{C}{2}$

242. In a triangle $\tan A+\tan B+\tan C=6$ and $\tan A\tan B=2$, then the values of $\tan A$, $\tan B$ and $\tan C$ are

(a) $\frac{1}{2},4,\frac{3}{2}$ (b) 2,1,3

(c) 1,2,0 (d) None of these

243. Maximum value of $\frac{1}{3\sin\theta-4\cos\theta+7}$ is

(a) $\frac{1}{12}$ (b) $\frac{1}{6}$

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

244. The value of $\sin 36^\circ\sin 72^\circ\sin 108^\circ\sin 144^\circ$ is

(a) $\frac{1}{4}$ (b) $\frac{1}{16}$

(c) $\frac{3}{4}$ (d) $\frac{5}{16}$

245. The maximum value of $cos^2\left(\frac{\pi}{3}-x\right)-cos^2\left(\frac{\pi}{3}+x\right)$ is

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

(c) $\frac{\sqrt{3}}{2}$ (d) $\frac{3}{2}$

246. $log\ tan\,1^0+\log\ tan2^0+\ldots+log\ tan\,8\,9^0$ is

(a) 1 (b) 0

(c) $\pi/4$ (d) None of these

247. If $y=(1+\tan A)(1-\tan B)$, where $A-B=\frac{\pi}{4}$, then $(y+1)^{y+1}$ is equal to

(a) 9 (b) 4

(c) 27 (d) 81

248. If $\cos x=\frac{2\cos y-1}{2-\cos y}$, where $x,\ y\,\epsilon\,(0,\pi)$, then $\tan\frac{x}{2}\cot\frac{y}{2}$ is equal to

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

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

249. $\cot 16^\circ\cot 44^\circ+\cot 44^\circ\cot 76^\circ-\cot 76^\circ\cot 16^\circ=$

(a) 1 (b) 2

(c) 3 (d) 4

250. If $\tan x = \frac{b}{a}$, then $\sqrt{\frac{(a+b)}{(a-b)}} + \sqrt{\frac{(a-b)}{(a+b)}}$ is equal to

(a) $\frac{2\sin x}{\sqrt{\sin 2x}}$ (b) $\frac{2\cos x}{\sqrt{\cos 2x}}$

(c) $\frac{2\cos x}{\sqrt{\sin 2x}}$ (d) $\frac{2\sin x}{\sqrt{\cos 2x}}$

251. If $\tan\alpha = k\cot\beta$, then $\frac{\cos(\alpha-\beta)}{\cos(\alpha+\beta)}$ is equal to

(a) $\frac{1+k}{1-k}$ (b) $\frac{1-k}{1+k}$

(c) $\frac{k+1}{k-1}$ (d) $\frac{k-1}{k+1}$

252. The value of $\cos\frac{\pi}{15}\cos\frac{2\pi}{15}\cos\frac{4\pi}{15}\cos\frac{8\pi}{15}$ is

(a) $\frac{1}{16}$ (b) $-\frac{1}{16}$

(c) 1 (d) 0

253. If $\frac{\cos A}{3} = \frac{\cos B}{4} = \frac{1}{5}$, $-\frac{\pi}{2} < (A, B) < 0$, then value of $2\sin A + 4\sin B$ is

(a) 4 (b) -2

(c) -4 (d) 0

254. If $\tan\alpha = \left(1+2^{-x}\right)^{-1}$, $\tan\beta = \left(1+2^{x+1}\right)^{-1}$, then $\alpha+\beta$ equals

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{4}$

(c) $\frac{\pi}{3}$ (d) $\frac{\pi}{2}$

255. If $(1+\tan\alpha)(1+\tan 4\alpha) = 2$, $\alpha \in \left(0, \frac{\pi}{16}\right)$, then α is equal to

(a) $\frac{\pi}{20}$ (b) $\frac{\pi}{30}$

(c) $\frac{\pi}{40}$ (d) $\frac{\pi}{60}$

256. $(1+\sin A)(1+\sin B)(1+\sin C) = (1-\sin A)(1-\sin B)(1-\sin C) = k \Rightarrow k =$

(a) $+\sin A\sin B\sin C$

(b) $\pm\cos A\cos B\cos C$

(c) $\pm\sec A\sec B\sec C$

(d) $\pm cosec\ A\ cosec\ B\ cosec\ C$

257. If $sec^4\theta + sec^2\theta = 10 + tan^4\theta + tan^2\theta$, then $sin^2\theta =$

(a) $\frac{2}{3}$ (b) $\frac{3}{4}$

(c) $\frac{4}{5}$ (d) $\frac{5}{6}$

258. If $f(x) = sin^6x + cos^6x$, then range of $f(x)$ is

(a) $\left[\frac{1}{4}, 1\right]$ (b) $\left[\frac{1}{4}, \frac{3}{4}\right]$

(c) $\left[\frac{3}{4}, 1\right]$ (d) None of these

259. The set of value of $\lambda \epsilon R$ such that $sin^2\theta + \cos\theta = \lambda\, cos^2\theta$ holds for some θ, is

(a) $(-\infty, 1]$ (b) $(-\infty, -1]$

(c) $\emptyset$ (d) $[-1, \infty)$

260. If $\cos 28° + \sin 28° = k^3$, then $\cos 17°$ is equal to

(a) $\frac{k^3}{\sqrt{2}}$ (b) $-\frac{k^3}{\sqrt{2}}$

(c) $\pm\frac{k^3}{\sqrt{2}}$ (d) None of these

261. Let $f(\theta) = \frac{\cot\theta}{1+\cot\theta}$ and $\alpha+\beta = \frac{5\pi}{4}$, then the value of $f(\alpha)f(\beta)$ is

(a) $\frac{1}{2}$ (b) $-\frac{1}{2}$

(c) 2 (d) None of these

Answer Key

1	B	16	C	31	B	46	D	61	C
2	B	17	B	32	B	47	A	62	B
3	B	18	C	33	B	48	C	63	B
4	C	19	C	34	A	49	C	64	C
5	B	20	C	35	C	50	C	65	C
6	B	21	D	36	D	51	D	66	B
7	A	22	B	37	D	52	B	67	C
8	C	23	C	38	A	53	D	68	D
9	C	24	C	39	A	54	C	69	B
10	A	25	A	40	D	55	A	70	B
11	B	26	A	41	B	56	A	71	B
12	D	27	B	42	B	57	A	72	A
13	C	28	B	43	A	58	D	73	A
14	A	29	B	44	B	59	B	74	A
15	B	30	A	45	A	60	D	75	A

76	C	91	B	106	D	121	C	136	D
77	B	92	C	107	A	122	A	137	A
78	B	93	C	108	D	123	A	138	A
79	D	94	A	109	C	124	A	139	B
80	B	95	C	110	A	125	B	140	B
81	C	96	D	111	A	126	B	141	A
82	D	97	D	112	C	127	B	142	B
83	D	98	B	113	A	128	B	143	B
84	D	99	D	114	A	129	C	144	B
85	B	100	A	115	C	130	B	145	D
86	B	101	D	116	C	131	B	146	C
87	D	102	C	117	C	132	C	147	B
88	D	103	D	118	B	133	D	148	C
89	B	104	B	119	D	134	A	149	C
90	D	105	A	120	D	135	D	150	D

151	C	166	A	181	B	196	A	211	A
152	C	167	A	182	B	197	C	212	B
153	B	168	A	183	B	198	B	213	C
154	D	169	C	184	C	199	A	214	B
155	B	170	A	185	B	200	B	215	A
156	A	171	A	186	D	201	C	216	A
157	C	172	C	187	D	202	A	217	B
158	B	173	A	188	C	203	B	218	A
159	C	174	B	189	B	204	C	219	A
160	A	175	B	190	D	205	B	220	A
161	D	176	B	191	D	206	C	221	C
162	B	177	B	192	A	207	D	222	B
163	A	178	C	193	D	208	D	223	D
164	B	179	B	194	B	209	B	224	A
165	B	180	A	195	B	210	B	225	A

226	A	241	B	256	B
227	B	242	B	257	C
228	A	243	C	258	A
229	D	244	D	259	D
230	A	245	C	260	A
231	C	246	B	261	A
232	B	247	C		
233	D	248	B		
234	B	249	A		
235	C	250	B		
236	A	251	A		
237	D	252	B		
238	D	253	C		
239	D	254	B		
240	A	255	A		

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