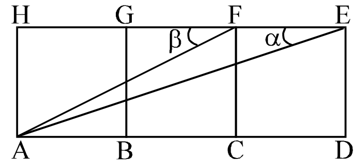
Class:XI **Time: 45 Min.** **M.M:40** **DPP. NO.-11**

[STRAIGHT OBJECTIVE TYPE] **[3 × 3 = 9]**

Q.1 The angles α and β are such that $\tan\alpha = m + 2$ and $\tan\beta = m$ where m is a constant. If $\sec^2\alpha - \sec^2\beta = 16$ then the value of $\cot(\alpha - \beta)$ is equal to

(A) 2 (B) 4 (C) 6 (D) 8

Q.2 In the given figure ABGH, BCFG and CDEF are all squares with the same side length. If $\alpha = \angle AEH$ and $\beta = \angle AFH$ then $(\alpha + \beta)$ equals



(A) $\pi/6$ (B) $\pi/4$

(C) $\pi/3$ (D) $\pi/2$

Q.3 $\sqrt[3]{5^{\frac{1}{\log_7 5}} + \frac{1}{\sqrt{-\log_{10}(0.1)}}}$ simplifies to

(A) 1 (B) $\sqrt{2}$ (C) 2 (D) 8

[REASONING TYPE] **[2 × 3 = 6]**

Q.4 Statement-1: If $N = \left(\frac{1}{0.4}\right)^{20}$ then N contains 7 digits before decimal.

Statement-2: Characteristic of the logarithm of N to the base 10 is 7.

(A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
(B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
(C) Statement-1 is true, statement-2 is false.
(D) Statement-1 is false, statement-2 is true.
[Use: $\log_{10}2 = 0.3010$]

Q.5 **Statement-1:** If $\alpha > \beta > 1$, then $\frac{\alpha^{\sqrt{\log_\alpha \beta}}}{\beta^{\sqrt{\log_\beta \alpha}}}$ is greater than 1.

Statement-2: $\log_c b = \frac{\log_a b}{\log_a c}$, if $0 < a , b, c \neq 1$.

(A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
(B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
(C) Statement-1 is true, statement-2 is false.
(D) Statement-1 is false, statement-2 is true.

[MATCH THE COLUMN] **[3+3+3+3=12]**

Q.6

	Column-I		Column-II
(A)	When the repeating decimal 0.363636............. is written as a rational fraction in the simplest form, the sum of the numerator and denominator is	(P)	4
(B)	Given positive integer p, q and r with $p = 3^q \cdot 2^r$ and $100 < p < 1000$. The difference between maximum and minimum values of (q + r), is	(Q)	8
(C)	If $\log_8 a + \log_8 b = (\log_8 a)(\log_8 b)$ and $\log_a b = 3$, then the value of 'a' is	(R)	15
(D)	Let $N = (2 + 1)(2^2 + 1)(2^4 + 1) \ldots\ldots (2^{32} + 1) + 1$ then $\log_{256} N$ equals	(S)	16

[SUBJECTIVE]

Q.7 If $N = \text{antilog}_7\left(\log_3\left(\text{antilog}_{\sqrt{3}}\left(\log_3 81\right)\right)\right)$, then $\log_3 N$ lies between two successive integers a and b. Find (a + b). **[4]**

Q.8 Let $a = (\log_7 81)(\log_{6561} 625)(\log_{125} 216)(\log_{1296} 2401)$

b denotes the sum of the roots of the equation $x^{\log_2 x} = (2x)^{\log_2 \sqrt{x}}$

and c denotes the sum of all natural solution of the equation $|x+1| + |x-4| = 7$.

Find the value of $(a + b) \div c$. **[6]**