Quadratic equations and Inequations(Inequalities)

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SectionC.MCQs with One Correct Answer

31) If one root is square of the other root of the equation $x^2+px+q=0$, then the relationship between p and q is (2004S)
   a) $p^3-q(3p-1)+q^2=0$
   b) $p^3-q(3p+1)+q^2=0$
   c) $p^3+q(3p-1)+q^2=0$
   d) $p^3+q(3p+1)+q^2=0$
32) Let a,b,c be the sides of the triangle where $a\neq b\neq c$ and λR. If the roots of the equation $x^2+2(a+b+c)x+3\lambda(ab+bc+ca)=0$ are real, then (2006-3M,-1)
   a) $\lambda<\frac{4}{3}$
   b) $\lambda>\frac{5}{3}$
   c) $\lambda\left(\frac{1}{3},\frac{5}{3}\right)$
   d) $\lambda\left(\frac{1}{3},\frac{4}{3}\right)$
33) Let α,β be the roots of the equation $x^2-px+r=0$ and $\frac{\alpha}{2},2\beta$ be the roots of the equation $x^2-qx+r=0$. Then the value of r is (2007-1marks)
   a) $\frac{2}{9}(p-q)(2q-p)$
   b) $\frac{2}{9}(q-p)(2p-q)$
   c) $\frac{2}{9}(q-2p)(2q-p)$
   d) $\frac{2}{9}(2p-q)(2q-p)$
34) let p and q be real numbers such that $p\neq 0, p^3\neq q and p^3\neq -q$. If $\alpha and \beta$ are nonzero complex numbers satisfying $\alpha+\beta=-p and \alpha^3+\beta 3=q$,then a quadratic equation having $\frac{\alpha}{\beta} and \frac{\beta}{\alpha}$ as its roots is (2010)
   a) $\left(p^3+q\right)x^2-\left(p^3+2q\right)x+\left(p^3+q\right)=0$
   b) $\left(p^3+q\right)x^2-\left(p^3-2q\right)x+\left(p^3+q\right)=0$
   c) $\left(p^3+q\right)x^2-\left(5p^3-2q\right)x+\left(p^3-q\right)=0$
   d) $\left(p^3+q\right)x^2-\left(5p^3+2q\right)x+\left(p^3-q\right)=0$
35) Let (x_0,y_0) be the solution of the following equatoions
   $(2x)^{ln2}=(3y)^{ln3}$
   $3^{lnx}=2^{lny}$
   then x_0 is (2011)
   a) $\frac{1}{6}$ b) $\frac{1}{3}$ c) $\frac{1}{2}$ d) 6
36) Let $\alpha and \beta$ be the roots of $x^2-6x-2=0$, with $\alpha>\beta$. if $a_n=\alpha^n-\beta n$ for $n\geq 1$,then the value of $\frac{a_{10}-2a_8}{2a_9}$ is (2011)

a) 1 b) 2 c) 3 d) 4

37) A value of b for which the equations
$x^2 + bx - 1 = 0$
$x62 + x + b = 0$
have one root in common is (2011)

a) $-\sqrt{2}$
b) $-i\sqrt{3}$
c) $i\sqrt{5}$
d) $\sqrt{2}$

38) The quadratic equation $p(x) = 0$ with real coefficients has purely imaginary roots. Then the equation$p(p(x)) = 0$ has (JEE Adv,2014)
a) one purely imaginary root
b) all real roots
c) two real roots and two purely imaginary roots
d) neither real nor imaginary roots

39) let $-\frac{\pi}{6} < \theta < -\frac{\pi}{12}$. Suppose $\alpha_1 and \beta_1$ are the roots of the equation $x^2 - 2x\sec\alpha + 1 = 0$ and $\alpha_2 and \beta_2$ are the roots of the equation $x^2 - 2x\tan\theta - 1 = 0$. If $\alpha_1 > \beta_1$ and $\alpha_2 > \beta_2$,then $\alpha_1 + \beta_2$ equals (JEE Adv.2016)
a) $2(\sec\theta - \tan\theta)$
b) $2\sec\theta$
c) $-2\tan\theta$
d) 0

Section D.MCQs with One or More than One Correct

1) for real x, the function $\frac{(x-a)(x-b)}{x-c}$ will assume all real values provided (1984-3Marks)

a) $a > b > c$
b) $a < b < c$
c) $a > c > b$
d) $a < c < b$

2) if S is the set of all real x such that $\frac{2x-1}{2x^3+3x^2+x}$ is positive,then S contains (1996-2Marks)

a) $\left(-infinity, -\frac{3}{2}\right)$
b) $\left(-\frac{3}{2}, -\frac{1}{4}\right)$
c) $\left(-\frac{1}{4}, \frac{1}{2}\right)$
d) $\left(\frac{1}{2}, 3\right)$

3) if a,b and c are distinct positive numbers, then the expression $(b + c - a)(c + a - b)(a + b - c) - abc$ is (1986-2 Marks)
a) positive
b) negative
c) non-positive
d) non-negative
e) none of these

4) if a,b,c,d and p are distinct real numbers such that $\left(a^2 + b^2 + c^2\right)p^2 - 2(ab + bc + cd)p + \left(c^2\right) + c^2 + d^2 \leq 0$ then a,b,c,d (1987-2 Marks)
a) are in A.P.
b) are in G.P.
c) are in H.P.
d) satisfy $ab = cd$
e) satisfy none of these

5) The equation
$x^{3/4\left(\log_2 x\right)^2 + \log_2 x - 5/4} = \sqrt{2}$

has (1989-2 Marks)

a) at least one real solution
b) exactly three solutions
c) exactly one irrational solution
d) complex roots

6) The product of n positive numbers is unity Then their sum is (1991-2 Marks)

a) a positive integer
b) divisible by n
c) equal to $n + \frac{1}{n}$
d) never less than n