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Class: X
Subject: Mathematics
Topic: Polynomials
No. of Questions: 20
Duration: 60 Min
Maximum Marks: 60

Q1. If α,β are zeroes of the polynomial f(x) = x2 + px + q, then polynomial having 1/α and 1/β as its zeroes is

(a) x2 + qx + p
(b) x2 – px + q
(c) qx2 + px + 1
(d) px2 + qx + 1

Sol: 1(C) $\alpha + B =$ - P

αB = q For polynomial having 1/α and 1/B as roots

$$\text{Sum} = \frac{1}{\alpha} + \frac{1}{b} = \frac{\alpha+B}{\alpha B} = \frac{-P}{q} = \frac{-coefficient\ of\ x}{coefficient\ of\ x2}$$

$$\text{Product} = \frac{1}{\alpha} + \frac{1}{b} = \frac{1}{\alpha} = \frac{constant\ fesm}{coefficient\ of\ x2}$$

→ Quadractic equation = qx^2 + px+1

(Shortcut when roots are inverse replace x by 1/x to get the equation)

Q2. If α and β are zeroes of x2 – 4x + 1, then 1/α + 1/β – αβ is

(a) 3 (b) 5 (c) –5 (d) –3

Sol: 2(A) x+B = 4 x/3 = 1

$$\frac{1}{x} + \frac{1}{b} - x/B \quad = \frac{x+B}{xB} - xB = 4 - 1 = 3$$

Q3. The quadratic polynomial having zeroes as 1 and –2 is :

(a) x2 – x + 2
(b) (b) x2 – x – 2
(c) (c) x2 + x – 2
(d) (d) x2 + x + 2

Sol:3(C) Sum of roots = - 1

Product = - 2

Quadratic equation = $x^2 + x - 2$

Q4. If α, β are zeroes of x2 – 6x + k, what is the value of k if 3α+2β=20?

A. (a)–16
B. (b) 8
C. (c) 2
D. –8

Sol:4(A) $x + B = 6$

$xB = K$

$3x + 2B = 20$

$2x + 2B + x = 2(x + B) + x = 20$

$= 12 + x = 20$

x=8

B= -2

xB = - 16

Q5. If one zero of $2x^2 - 3x + k$ is reciprocal to the other, then the value of k is

A. 2
B. −23
C. −32
D. –3

Sol:5(A) Roots x, 1/ x

Product $\alpha x \frac{1}{\alpha} = 1 = \frac{R}{2}$

R = 2

Q6. The quadratic polynomial whose sum of zeroes is 3 and product of zeroes is –2 is

A. $x^2 + 3x - 2$
B. $x^2 - 2x + 3$
C. $x^2 - 3x + 2$
D. $x^2 - 3x - 2$

Sol:6 (D) Sum of zoos = 3

Product = - 2

equation x^2 -3 x-2

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Q7. If (x + 1) is a factor of $x^2 - 3ax + 3a - 7$, then the value of a is :

A. (a)1
B. (b) –1
C. (c) 0
D. –2

Sol: 7(A) $P(x) = x^2$- 32 x+32-7

x+1 is factor of P(x) Using factor theorem

P(-1) = 0 = 1-3a(-1)+3a-7

= -616a

a=1

Q8. The number of polynomials having zeroes –2 and 5 is :

A. (a)1
B. (b) 2
C. (c)3
D. (d) more than 3

Sol:8(D) More have than 3 as any number of polymomials can have roots -2,5 and additional roots

Q9. The quadratic polynomial p(y) with –15 and–7 as sum and one of the zeroes respectively is :

A. y2 – 15y – 56
B. y2 – 15y + 56
C. y2+ 15y + 56
D. y2 + 15y – 56

Sol:9(C) Sum = - 15

$x = B = -15$

$x = -7$ $B = -8$ Product = 56 Polynomial – y^2 +15y + 56

Q10.The degree of the polynomial $(x + 1)(x^2 - x - x^4 + 1)$ is :

A. 2
B. 3
C. 4
D. 5

Sol: 10(d)$(x + 1)(x^2 - x - x^4 + 1)$

$x^2 - x^2 - x^5 + x + x^2 - x^{-}x^4 + 1$

-$x^5 + x^4 + x^3 + 1$

Q11. If sum of the squares of zeroes of the quadratic polynomial f(x) = $x^2 - 8x + k$ is 40, the value of k is :

A. 10
B. 12
C. 14
D. (d) 16

Sol: 11(b) let roots be α, B

$$\alpha^2 + B^2 = 40$$

$$(\alpha + B)^2 - 2\alpha B = 40$$

64-2R =40

24=2R

R=12

Q12. Find a cubic polynomial when the zeroes are 3, -1, -$\frac{1}{3}$

A. $3x^3 - 5x^2 - 11x - 3$
B. $3x^3 + 5x^2 + 11x - 3$
C. $3x^3 - 5x^2 + 11x + 3$
D. None of these

Sol: (12)(D) Find sum of geroes sum of geroes taken two at a time product of geroes and then just simple

rule of forming equation

Q13. The quotient and remainder are x -2 and -2x+4 respectively. If the polynomial x^3-3x^2+x+2

Is divided by g(x). Find g(x)

A. x^2+x+1
B. x^2-x-1
C. x^2-x+1
D. none of these

Sol: 13(c) $\mathrm{P}(x) = g(x)q(x) + \alpha(x)$

Diridend divisor quotient remainder

$$q(x) = \frac{p(x) - \alpha(x)}{q(x)}$$

Substitute and get the answer

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Q14. If the quotient and remainder were 3y – 5 and 9y + 10, on dividing $3y^3+y^2+2y+5$by g(y).Find g(y)

A. y^2-2y+1
B. y^2+2y+1
C. y^2-2y-1
D. $2y^2-2y-1$

Sol:14(b)

Q15.if two of the zeroes are $2+\sqrt{3}\, and\ 2-\sqrt{3}$. Find the other zeroes of $t^4-6t^3-26t^2+138t-35$

A. 7and 5
B. 7and-5
C. (-6,7)
D. (-5and-7)

Sol: (15)b$2+\sqrt{3}\,, 2-\sqrt{3}\ are\ gewes$

$x-2-\sqrt{3}\ ,x-2+\sqrt{3}\ are\ factor$

$(x-2-\sqrt{3})(x-2+\sqrt{3})$is a factor

$$(x-2)^2-\left(\sqrt{3}\right)^2$$

$$x^2+4-4\,x-3=x^2-4x+1$$

Diride the poly normal gnen in question by factor obtamed if will be reduced to quadratic

Poly normal from which other roots can be found

Q16. Find the sum and product of the zeroes of polynomial x^2-51x

A. 0,51
B. 0,-51
C. 2,51
D. -2,51

Sol: (16) Sum =51

Product = 0

Q17. If p and q are the zeroes of the polynomial x^2-5x-k. Such that p – q = 1, find the value of K

A. 6
B. 7
C. 8
D. 9

Sol: (17)a$p+q=5\ \ pq=-R$

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$$(p-q)=1$$

$(p-q)^2=1$ (Squating both sides)

$$(p+q)^2-4pq=1$$

$$5^2-4(-R)=1$$

24=-4R

R=-6

Q18. Find the remainder when $y^3+4y^2-3y+10$ is divided by y +4

A. 22
B. -22
C. 21
D. 20

Sol: (18)a Simply use remaindes theorem

Q19. If the product of zeroes of the quadratic polynomial $mx^2+6x+(2m-1)$ is – 1, then find the value of m

A. $\frac{1}{3}$
B. 3
C. $-\frac{1}{3}$
D. -3

Sol: (19)a$\frac{2m-1}{m}=-1$

2m-1=-m

3m= 1

M=1/3

Q20. Find the quotient and remainder when y^4+y^2+1 is divided by y^2+y+1

A. y^2-y+1,0
B. y^2+y+1,1
C. y^2-y-1,0
D. None

Sol: (20)D Use lons division Method