Ramsaday College,Amta(Howrah)

Subject: Theory of equation,Inequality,Integers

Mathematics Class Test 2018

Full Marks: 30, Time: 60 minutes

Date: 20/03/2018

Answer the following questions.

1. The equation x^n-nqx +(n-1)r=0 will have a pair of equal roots if (i) $q^{n-1}=r^n$ (ii)$q^n+(-1)^n r^{n-1}$ =0.(iii) $q^n=r^{n-1}$.(iv) $q^{n-1}=r^{n-2}$.
2. What is the relation between q and r in order that x^3+ qx+ r =0 may be put in the form $x^4=(x^2+ax+b)^2$? (i) $8q^2+r^3$ =0 (ii) $8q^3+r^2$=0 (iii) $8r^2+q^3$=0 (iv) $q^3=8r^2$.
3. If α be a multiple root of order 3 of the equation x^4+bx^2+cx+ d =0,(d≠ 0) then α is equal to (i) -$\frac{8b}{3c}$ (ii)-$\frac{8d}{3c}$ (iii) -$\frac{8c}{3d}$ (iv) $\frac{8d}{3c}$.
4. If one of the roots of the equation x^3+ax^2+bx+c=0 equals the sum of the other two ,then (i) a^3+8c-8ab=0 (ii) a^3+8c-4ab=0 (iii) a^3-8c-4ab=0 (iv) none.
5. If an integer m is a multiple root of order p of the equation x^5-5x^3+5x^2-1=0,then (i) p=5 (ii)p=2 (iii)p=3 (iv) p=4.
6. The unit digit in 7^{99} is (i) 2.(ii) 3 (iii) 1 (iv) 4.
7. The last two digit in 33^{100} is (i) 10 (ii) 11 (iii)01 (iv)61.
8. Two integers u and v satisfying 54u+24v =30 is (i)u=5,v=-10 (ii) u=-10, v=5 (iii)u=-5,v=10 (iv) u=7, v=10.
9. The remainder when 1! + 2! +3! +……+50! Is divided by 15 is (i) 3 (ii) 4 (iii)5 (iv) 6.
10. The least positive residue in 2^{41}(mod23) is (i) 2 (ii) 3 (iii) 4 (iv) 5.
11. If a ,b are positive and a+b=4 then $(a+\frac{1}{a})^2+(b+\frac{1}{b})^2 \geq$ (i)$\frac{17}{2}$ (ii) $\frac{25}{2}$ (iii)$\frac{49}{4}$ (iv) $\frac{9}{2}$.
12. If x> 0 and a is known positive numbers ,then the least value of ax +$\frac{a}{2x}$ is (i)a (ii) $\frac{a}{\sqrt{2}}$(iii) $\sqrt{2}$ a(iv)a^2
13. Let x_1,x_2,……,x_n be n positive numbers such that $x_1.x_2$……x_n=1 ,then x_1+x_2+…….+$x_n$is (i)>n+$\frac{1}{n}$ (ii)<n+$\frac{1}{n}$ (iii) >1 +$\frac{1}{n}$ (iv) none.
14. If a+b+c=0(a,b,c>0) then ab+bc+ca (i) <0 (ii) >0(iii) ≥ 1 (iv) none.
15. The maximum value of $(4-x)^3(2+x)^6$ is (i) 2^9 (ii) 2^{16} (iii) 2^{15} (iii) 2^{12} .