K.S.G.M. COLLEGE

Nirsha, Dhanbad

Sem-VI | **Internal Exam.-2021** | **D.S.E.-3**

Theory of Equation

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1. The number of roots of the equation of nth degree is
   (i) $n+1$ (ii) n^2 (iii) n (iv) $n-1$

2. The sum of the roots of the equation
   $x^7 + 6x^5 - 7x^4 + 11x^3 - 2x^2 + 9x + 11 = 0$ is
   (i) -6 (ii) 7 (iii) 0 (iv) None of these

3. If $2+3i$ be on root of the equation
   $x^2 - 4x + 13 = 0$ then the other root is
   (i) 2 (ii) $2+3i$ (iii) $2-3i$ (iv) None of these

4. Every polynomial equation of an odd degree has
   (i) No real root
   (ii) At least one real root
   (iii) All roots real
   (iv) All roots imaginary

5. The maximum number of +ve roots of the equation
   $x^7 - 11x^5 + x^3 - 7x^2 + 3x + 10 = 0$ is
   (i) 4 (ii) 5 (iii) 2 (iv) None of these

6. When n is even, the equation
   $x^n - 1 = 0$ has only
   (i) Two real roots
   (ii) One real root
   (iii) Three real roots
   (iv) None of these

7. Let α, β, γ be the root of the cubic
   $a_0x^3 + 3a_1x^2 + 3a_2x + a_3 = 0$
   if discriminant $G^2 + 4H^3 < 0$ then
   (i) roots of the cubic are all real.
   (ii) The cubic has a pair of imaginary roots.
   (iii) The cubic has two equal roots.
   (iv) None of these.

8. When The cubic $a_0x^3 + 3a_1x^2 + 3a_2x + a_3 = 0$ reduces to $z^3 + 3xz + G = 0$ then H is

(i) $a_0a_2 - {a_1}^2$ (ii) $a_0a_1 - {a_2}^2$

(ii) $a_1a_2 - {a_0}^2$ (iv) None of these

9. If α, β, γ be the root of the equation $x^3 + px^2 + qx + r = 0$ then $\sum \alpha^2$ is

(i) $p^2 - 2q$ (ii) $q^2 - 2p$

(iii) $r^2 - 2p$ (iv) None of these

10. If $\alpha, \beta, \gamma, \delta$ be the roots of the equation $x^4 + px^3 + qx^2 + rx + s = 0$ then $\sum \alpha^2 \beta$ is

(i) $3r - pq$ (ii) $3p - qr$

(iii) $3q - pr$ (iv) None of these

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MATH D.S.E IV U.G Sem VI (2018-21)

Answer all questions (10 X 2 = 20 marks)

1) If three forces acting in one plane upon a rigid body keep it equilibrium, they must
   (a) meet at a part only (b) be parallel only
   (c) both (a) and (b) (d) none of these

2) The virtual work done by the tension T of a string is.
   (a) T. δl (b) -T. δl (c) 0 (d) none of these

3) An example of stable equilibrium is.
   (a) a pendulum in the rest position. (b) an egg standing on one end.
   (b) a hook placed flat anywhere in the table (d) all of these

4) Cartesian of a common catenary is.
   (a) S= e tan y (b) $y = c \sin h\frac{x}{c}$ (c) y = c sec y (d) y = c cos h$\frac{x}{c}$

5) For forces in three dimensions (X, Y, Z, L, M, N), the pitch p is given by.
   (a) $\frac{R}{K}$ (b)$\frac{K}{R}$ (c) K.R (d) none of these

6) The representative equation of S.H.M is given by.
   (a) $\frac{d^2x}{dt^2} = \mu x$ (b) $\frac{d^2x}{dt^2} = -\mu x$ (c) $\frac{d^2x}{dt^2} = \frac{-u}{x}$ (d) none of these

7) If a particle moves along a circle of radius a then radical velocity is given by.
   (a) 0 (b) a (c) not possible (d) ∞

8) A particle moves from a fixed point in such a way that velocities in the fixed direction are aest & definite.
   … its acceleration is given by
   (a) a (b) 0 (c) non-zero constant (d) 1

9) In an elliptic orbit about the centre the apsidal angle is.
   (a) π (b) 2 π (c) $\frac{\pi}{4}$ (d) $\frac{\pi}{2}$

10) The maximum displacement of a particle from mean position is called.
   (a) amplitude of the oscillation.
   (b) phase of the particle.
   (c) time period of the oscillation.
   (d) frequency of the oscillation.

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MATH(GEN) Sem VI (2018-21)

Answer all questions (10 X 2 = 20 marks)

1) The region of an argand plane defined by $|Z-1|+|Z| \leq \mu$ is
   (a) Interior of an ellipse (b) exterior of an ellipse
   (c) interior & boundary of an ellipse (d) none of these

2) The least positive integer n which will reduce to $(\frac{1+i}{1-i})^n$ to unity is

   (a) 2 (b) 4 (c) 8 (d) 12

3) The complex numbers z_1, z_2, z_3 are the vertices A,B,C of a parallelogram ABCD then the fourth vertex D Is.

   (a) $z_1 + z_2 - z_3$ (b) $z_2 + z_3 - z_1$ (c) $z_1 + z_3 - z_2$ (d) all of the above

4) If $u = x^3-3xy+3x^2+3y^2+1$ then the analytic Function f(Z) is.

   (a) $Z^3 - 3Z^2+C$ (b) Z^3+3Z^2+C (c) Z^2+3Z^3+C (d) Z^2-3Z^3+C

5) The function $ff(Z) = |Z|^2$ is

   (a) everywhere analytic (b) nowhere analytic

   © analytic at Z=0 (d) none of these

6) If f(Z) is analytic in a domain D then.

   (a) $f^n(Z) = 0$ for all $Z \in 0$ (b) $f^n(Z)$ exist in

   (c) $f^n(Z)$ does not exist in 0 (d) none of these

7) which of the following function f(Z) = u + iv don not satisfy C-R equation.

   (a) sin Z (b) (c) $\bar{Z}$ (d)) Z^n

8) $\lim_{z\to 0} \frac{\bar{z}}{z}$ is equal to

   (a) 0 (b) 1 (c) ½ (d) does not exist

9) The function $f(Z) = \frac{1}{Z^2+4}$ is

   (a) analytic for all Z (b) analytic for Z = -2

   (c) not analytic of $Z = \pm Z_i$ (d) none of these

10) Cauchy- Rienmann equation for $f(Z)^2 = 4 + i$ to be analytic.

   (a) $\frac{\partial u}{\partial x} = \frac{-\partial v}{\partial y}, \frac{\partial u}{\partial y} = \frac{\partial v}{\partial x}$

   (b) $\frac{\partial u}{\partial x} = \frac{\partial v}{\partial y}, \frac{\partial u}{\partial y} = \frac{-\partial v}{\partial x}$

   (c) $\frac{\partial u}{\partial x} = \frac{\partial v}{\partial y}, \frac{\partial u}{\partial y} = \frac{\partial v}{\partial x}$

   (d) none of these