MATHEMATICS

1. Three non-zero complex numbers z1, z2, z3 satisfying

|z1|2+ |z2|2+ |z3|2

= |z1z2| + |z2z3| + |z3z1| lie on a circle with centre

(A) (0, 0) (B) (1, 1)

(C) (i, i) (D) none of these

2. Number of values of ,2,2which satisfies the equation sin2 2cos cos2 2sinis equal to

(A) 0 (B) 1

(C) 2 (D) 4

3. Im(z) is equal to (A) (z z)i21(B) (z z)21(C) (z z)i21

(D) none of these

4. The value of (i8+ i)3+ (i8– i)6is

(A) 1 + i (B) -2 + 10i

(C) 1 + 3i (D) 1 – i

5. If abc = 8 and a, b, c > 0, then the minimum value of (2 + a) (2 + b) (2 + c) is

(A) 32 (B) 64

(C) 8 (D) 10

6. The sum of 19 terms of an A.P., whose nth terms is 2n + 1 is

(A) 390 (B) 399

(C) 499 (D) none of these

7. If the first term of a G.P. is 1 and the sum of the third and fifth terms is 90. Then the

common ratio if G.P. is

(A) 1 (B) 2

(C) 3 (D) 4

8. The total number of real roots of the equation 2x4

+ 5x2

+ 3 = 0 is

(A) 4 (B) 0

(C) 2 (D) 3

9. Let , , , are the roots of equation x4+ x2+ 1 = 0 then the equation chose roots are 2, 2, 2, 2is

(A) (x2– x + 1)2= 0 (B) (x2+ x + 1)2= 0(C) x4– x2+ 1 = 0 (D) x2+ x + 1 = 0

10. The number of real roots of the equation

2x 7x 723= 9 is

(A) 0 (B) 2

(C) 1 (D) 4

CHEMISTRY

1. 5 moles of a gas in a closed vessel was heated from 300K to 600K. The pressure of the gas doubled. The no. of moles of the gas at 600 K

(A) 5 (B) 2.5

(c) 10 (D) 20

2, If 5 L of H2O2 produces 50 L of O2 at NTP, H2O2 is:

(A) '50V' (B) '10V'

(C) '5V' (D) None

3. 500 ml of a 0.1 N solution of AgNO3 is added to 500mL of a 0.1N KCl solution. The concentration of nitrate in the resulting mixture is:

(A) 0.1 N (B) 0.05 N

(C) 0.01N (D) 0.2N

4 One faraday of current was passed through the electrolytic cells placed in series containing solution of Ag+

, Ni2+and Cr3+ respectively. The ratio of amounts of Ag, Ni and Cr deposited

will be: (At. wt. of Ag = 108, Ni = 59, Cr = 52)

(A) 108 : 29.5 : 17.4 (B) 17.4 : 29.5 : 108

(C) 1 : 2 : 3 (D) 3 : 2 :1

5. In the electrolysis of H2O, 11.2 L of H2 was liberated at cathode at NTP. How much O2 will be liberated at anode under the same condition?

(A) 11.2L (B) 22.4L

(C) 5.6 L (D) 2.8L

6. Which of the following is disproportionation reaction:

(A) $2CrO_4^{2-} + 2H^+ \rightarrow Cr_2O_7^{2-} + H_2O$ (B) $2ClO_3^- \rightarrow 2Cl^- + 3O_2$

(C) $CaCO_3 + 2H^+ \rightarrow Ca^{2+} + H_2O + CO_2$ (D) none of these

7. A radioactive isotope having a half life of 3 days was received after 12 days. It was found that there were 3 gm of the isotope in the container. The initial weight of the isotope when it was packed: (antilog 1.203 = 16)

(A) 12 gm (B) 24 gm

(C) 36 gm (D) 48 gm

8. The ratio of the difference in energy between the first and second Bohr orbit to that between the second and third Bohr orbit is:

(A) 21(B) 2(C) 9(D) 527

9. A sample of rock from moon contains equal number of atoms of uranium and lead ($t_{1/2}$ for U = 4.5 109 Yrs).The age of rock would be:

(A) 4.5 109yrs (B) 9 109yrs.(C) 13.5 109yrs. (D) 2.25 109yrs.

10. For a d-electron, the orbital angular momentum is

(A) 62h(B) 2h

(C) 2h(D) 2

PHYSICS

1. A body falls from rest, in the last second of its fall, it covers half of the total distance. Then the total time of its fall is

(A) 2 + 2sec (B) 2 - 2sec (C) 2 2(D) 4 sec

2. A force of 6 kgf and another force of 8 kg f can be applied to produce the effect of a single force equal to

(A) 1 kgf (B) 16 kgf

(C) 10 kgf (D) 0 kgf

3. From the top of the tower two bodies are projected horizontally with velocities 10 m/sec and 20 m/sec. They hit the ground in t1 and t2 seconds respectively. Then

(A) t1 = 2t2 (B) t2 = 2t1

(C) t1 =t2 (D) t1 = 2t2

4. A stone is tied at the end of a string 4m long and whirled in a circle in a vertical plane. The minimum speed of the stone at the lowest point for the circular motion to be just completed is

(A) 14 m/sec (B) 7 m/sec

(C) 6.3 m/sec (D) 28 m/sec

5. A particle P is moving in a circle of radius a with a uniform speed V, C is the center of the circle and AB is diameter. The angular velocity of P about A and C are in the ratio

(A) 1 : 1 (B) 1 : 2

(C) 2 : 1 (D) 4 : 1

6. A bird sits on a stretched telegraph wire. The additional tension produced in the wire is

(A) zero (B) less than weight of the bird

(C) equal to weight of the bird (D) greater than the weight of the bird

7. A block of mass 2 kg rests on a rough inclined plane making an angle of 300 with frictional coefficient between the block and the plane is 0.7. The frictional force on the block is

(A) 9.8 N (B) 0.7 9.8 3N

(C) 9.8 3N (D) 9.8 0.7 N

8. A man of mass 60 kg records his weight on a weighing machine placed inside a lift. The ratio of weight of man recorded when lift is ascending up with a uniform speed of 2 m/sec to when it is descending down with a uniform speed 4 m/sec will be

(A) 0.5 (B) 1

(C) 2 (D) none

9. The potential energy of a particle executing linear simple harmonic motion is given V(x) = 2kx2 , where k is force constant and is equal to 0.5 N/m. The amplitude of particle if its total energy is equal to 1 Joule

(A) 22meter (B) 2meter(C) 2meter (D) none of these

10. The period of revolution of a satellite around a planet of radius R is T. Period of revolution around another planet whose radius is 3R is

(A) T (B) 3T

(C) 9T (D) 33T2