1.The slit width, when a light of wavelength 6500Å is incident on a slit, if first minima for red light is at 300
a) 1×10^{-6}m b) 5.2×10^{-6}m c) 1.3×10^{-6}m d)
 2.6×10^{-6}m
2.Newton's rings are observed by keeping a spherical surface of 100cm radius on a plane glass plate.
The wave length of light used is 5880Å.If the diameter of the 15th bright ring is 0.59cm, the diameter of the 5th ring is
a) 0.226cm b) 0.446cm c) 0.336cm d)
 0.556cm
3.The resulting intensity after interference of two coherent waves represented by $y_1a_1\cos t$ and $y_2a_2\cos 2t$ will be
a) a_1-a_2 b) a_1+a_2 c) $a_1^2-a_2^2$ d)
 $a_1^2+a_2^2$
4.In a young's experiment, one of the slit is covered with a transparent sheet of thickness 3.6×10^{-3}cm due to which position of central fringe shifts to a position originally occupied by 30th bright fringe. The refractive index of the sheet, if $\lambda=6000$Å is
a) 1.5 b) 1.2 c) 1.3 d) 1.7
5.In young's double slit experiment with monochromatic light of wave length 600nm, the distance between slits is 10^{-3}m. For changing fringe width by 3×10^{-5}m
a) the screen is moved away from the slits by 5cm b) the screen is moved by
5cm towards the slits c) the screen is moved by 3cm towards the slits d)
 both (a) and (b) are correct
6.When two coherent monochromatic light beams of intensities I and 4I are superimposed, what are the maximum and minimum possible intensities in the resulting beams?
a) 5I and I b) 5I and 3I c) 9I and I d) 9I and
3I
7.In young's double slit experiment when violet light of wave length 4358Å is used, then 84 fringes are seen in the field of view, but when sodium light of certain wave length is used, then 62 fringes are seen in the field of view, the wave length of sodium light is
a) 6893Å b) 5904Å c) 5523Å d) 6429Å
8.In an interference pattern the position of zeroth order maxima is 4.8mm from a certain point P on the screen. The fringe width is 0.2mm. The position of second maxima from point P is
a) 5.1 mm b) 5 mm c) 40 mm d) 5.2 mm
9.If young's double slit experiment is performed in water,
a) the fringe width will decreases b) the fringe width will increase c)
 the fringe width will remain unchanged d) there will be no fringe
10.The first diffraction minimum due to single slit diffraction is θ, for a light of wave length 5000Å. If the width of the slit is 1×10^{-4}cm, then the value of θ is
300 b) 450 c) 600 d) 150
10. The number of ways in which four letters can be selected from the word 'APSARA'
(A) 2 (B) 7
(C) 5 (D) 10

1. Number of ways of selecting 7 players out of 12 players when 2 of them are always included
(A) 10C6 (B) 10C5
(C) 12C7 (D) 10C7
2 The coefficient of x5
in the expansion of $(1 + x)^{21} + (1 + x)^{22} + \ldots\ldots + (1 + x)^{30}$ is
(A) 51C5 (B) 9C5
(C) 31C6 -
21C6 (D) 30C5 + 20C5.
3. If the coefficients of x
7
and x8
in
n
3

$\frac{x}{2}$

are equal then n is
(A) 56 (B) 55
(C) 45 (D) 15.

4. The sum of all the coefficients in the binomial expansion of $(x^2 + x - 3)^{319}$ is
(A) 1 (B) 2
(C) – 1 (D) 0.

5. The smallest positive integer n, for which $n! < \left(\frac{n}{2}\right)^{n}$

n 1

holds, is
(A) 1 (B) 3
(C) 2 (D) 4

6. If $x^a = x^{b/2} z$
$= x^{b/2} z$
$b/2 = z^c$
, then a, b, c are in
(A) A.P. (B) G.P.
(C) H.P. (D) none of these

7. If $x^{18} = y^{21} = z^{28}$, then 3, 3 $\log_y x$, 3$\log_z y$, 7$\log_x z$ are in
(A) A.P. (B) G.P.
(C) H.P. (D) none of these

8. The least value of 'a' for which $5^{1 + x} + 5^{1 – x}$

, ,

$\frac{a}{2}$

$25^x + 25^{-x}$

are three consecutive terms of an
A.P. is
(A) 10 (B) 5
(C) 12 (D) none of these

29. If $A = 1 + r^a + r^{2a} + r^{3a} + \ldots$ and $B = 1 + r^b + r^{2b} + r^{3b} + \ldots$, then a/b is equal to
(A) $\log_{1 - B}(1 - A)$ (B)

A

A 1

log

B

B 1(C) $\log_B A$ (D) none of these

30. If $a_1, a_2, a_3, \ldots$ is an A.P. such that $a_1 + a_5 + a_{10} + a_{15} + a_{20} + a_{24} = 225$ then $a_1 + a_2 + a_3 + \ldots + a_{23} + a_{24}$ is equal to
(A) 909 (B) 75
(C) 750 (D) 900

1. $K_w(H_2O)$ at 25^0C is 1×10^{-14}. Dissociation constant of
$2H_2O \rightleftharpoons H_3O^+ + OH^-$
is
(A) 1.8×10^{-16} (B) 10^{-14}
(C) 55.5 (D) 18

2. For an ideal gas a plot of (PV/RT) v/s T will look like

T
RT
PV T

T
RT
PV T

T
RT
PV

T
T
RT
PV
T

(A) (B)
(C) (D)

3. The pairs of compounds which cannot exist together in solution is
(A) $NaHCO_3$ and $NaOH$ (B) Na_2CO_3 and $NaOH$
(C) Na_2CO_3 and $NaHCO_3$ (D) $NaHCO_3$ and $NaCl$

4. The hydration energy of Mg^{2+} is greater than
(A) Al^{3+} (B) Na^+
(C) Be^{2+} (D) Mg^{3+}

O CH2 CH CH2
100.
*
$AlCl_3$
?
OH
CH2 CH CH2
*
(A) *
OH
CH2 CH CH2
(B)
OH
CH2 CH CH2
*
(C) (D) none

6. The reaction of
H3CHC CH OH
with HBr gives
(A) CHCH3 C H2 OH
Br
(B) CH3 C H2 C H OH
Br
(C) HC C H2 Br
Br
H3C (D) C H3C H2 C H Br
Br

27. The structure shows
CH3
C
H3C
C
H

H
COOH
CH3
(A) geometrical isomerism (B) optical isomerism
(C) geometrical and optical isomerism (D) tautomerism
8. The standard reduction potential values of three metallic cations X, Y & Z are 0.52, -3.03 and
-1.18 V respectively. The order of reducing power of corresponding metals is
(A) Y > Z > X (B) X > Y > Z(C) Z > Y > X (D) Z > X > Y
9.
$14C6$ is a beta – active nucleus. A sample of $14CH4$ gas kept in a closed vessel shows
increase in pressure with time. This is due to the
(A) formation of $14NH3$ and $H2$ (B) formation of $11BH3$ and $H2$
(C) formation of $14C2H4$ and $H2$ (D) formation of $12CH3$,
$14NH2$ and $H2$
10. pKa (NH4
+
) = 9.26. 500 mL of 0.01 M NH4OH solution will have pH = 8.26 if X mol of
(NH4)2SO4 is added. X is
(A) 005 mol (B) 0.005 mol
(C) 0.025 mol (D) 0.10 mol