

FINAL ANSWER KEY

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1. Two finite sets A and B have m and n elements, respectively. The total number of subsets of A is 48 more than the number of subsets of B . The values of m and n , respectively, are
- A) 6,3
 - B) 6,4
 - C) 5,6
 - D) 2,6
 - E) 7,1

Correct Answer : Option B

2. Let A and B be subsets of universal set U such that $n(U) = 800, n(A) = 300, n(B) = 200$ and $n(A \cap B) = 100$. Then the number of elements in the set $A' \cap B'$ is
- A) 50
 - B) 100
 - C) 700
 - D) 400
 - E) 200

Correct Answer:-Question Cancelled

3. If $f(x) = \frac{x}{x-1}$ then $\frac{f(a)}{f(a+1)}$ is equal to
- A) $f(a^2)$
 - B) $f(-a)$
 - C) $f(-a^2)$
 - D) $f\left(\frac{1}{a}\right)$
 - E) $f\left(\frac{1}{a^2}\right)$

Correct Answer : Option A

4. If $f: R \rightarrow R$ satisfies the relation $f(x+y) = f(x) + f(y), \forall x, y \in R$ and $f(1) = 3$ then $f(0) + f(1) + f(2) + f(3)$ is equal to
- A) 12
 - B) 14
 - C) 16
 - D) 18
 - E) 22

Correct Answer : Option D

5. If $z = 2 + i, i^2 = -1$, then the value of $z^2 - 4z + 15$
- A) 2
 - B) 6
 - C) 15
 - D) 12
 - E) 10

Correct Answer : Option E

6. The modulus of the complex number $\left(\frac{i-2}{2-i}\right)$ is equal to
- A) $\frac{2}{5}$
 - B) $\frac{5}{4}$
 - C) $\frac{2}{3}$
 - D) $\frac{3}{2}$
 - E) $\frac{5}{2}$

Correct Answer : Option E

7. If the complex number z varies so that the real and imaginary parts of $z - 2 - 3i$ are equal, then the locus of z is
- A) a circle
 - B) a straight line
 - C) a parabola
 - D) an ellipse
 - E) a hyperbola

Correct Answer : Option B

8. If $k = 4n + 3$, where n is an integer and $i^2 = -1$ then i^k is equal to
- A) 0
 - B) 1
 - C) -1
 - D) i
 - E) $-i$

Correct Answer : Option E

9. The sum of first three terms of a G.P. is 14 and the sum of next three terms is 112. Then 100th term of the G.P. is
- A) 2^{99}
 - B) 2^{101}

- C) 2^{100}
- D) $2^{98} - 1$
- E) $2^{99} + 1$

Correct Answer : Option C

- 10.** The product of first four terms of a G.P. is 324 and the product of first three terms of the G.P. is 216. Then the first term is
- A) 3
 - B) 6
 - C) 9
 - D) 16
 - E) 12

Correct Answer : Option E

- 11.** The product of first four terms of a G.P. is $\frac{1}{1024}$. Then the product of second and third terms is,
- A) $\frac{1}{28}$
 - B) $\frac{1}{16}$
 - C) $\frac{1}{64}$
 - D) $\frac{1}{32}$
 - E) $\frac{1}{128}$

Correct Answer : Option D

- 12.** If the A.M. of a and c is 16 and if $a = 8$, then the G.M. of a and c is
- A) $8\sqrt{3}$
 - B) $6\sqrt{3}$
 - C) $5\sqrt{3}$
 - D) $4\sqrt{3}$
 - E) $2\sqrt{3}$

Correct Answer : Option A

- 13.** If ${}^n P_5 = 42^n P_3$ then n is equal to
- A) 3
 - B) 5
 - C) 7
 - D) 12
 - E) 10

Correct Answer : Option E

- 14.** The number of arrangements of the letters of the word INDEPENDENCE such that the first letter is I and the last letter is P, is
- A) 12400
 B) 12420
 C) 12440
 D) 12600
 E) 12620

Correct Answer : Option D

- 15.** If four coins are tossed, then the number of possible ways of getting 2 or 3 heads, is
- A) 12
 B) 10
 C) 8
 D) 6
 E) 4

Correct Answer : Option B

- 16.** The value of $\frac{{}^5C_r}{{}^6C_r}$ when the numerator and denominator take their greatest value, is
- A) 2
 B) $\frac{1}{2}$
 C) 1
 D) $\frac{5}{6}$
 E) $\frac{6}{5}$

Correct Answer : Option B

- 17.** If $(1 + x - 2x^2)^6 = 1 + a_1x + a_2x^2 + \dots + a_{12}x^{12}$ then the sum $a_2 + a_4 + a_6 + \dots + a_{12}$ has the value
- A) 31
 B) 32
 C) 33
 D) 63
 E) 64

Correct Answer : Option A

- 18.** If $A = \begin{bmatrix} 5 & 2 & x \\ y & 2 & -3 \\ 4 & t & -7 \end{bmatrix}$ is a symmetric matrix, then the values of x, y and t , respectively, are
- A) 4,2,3
 B) 4,2,-3
 C) 4,2,-7
 D) 2,4,-7
 E) 4,3,2

Correct Answer : Option B

19. If $A = \begin{bmatrix} & 0 \\ 1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 16 & 0 \\ 5 & 1 \end{bmatrix}$ and if $A^2 = B$ then the value X is equal to

- A) 2
- B) 3
- C) 4
- D) 5
- E) 6

Correct Answer : Option C

20. If $\alpha + \beta + \gamma = 0$, then $\begin{vmatrix} e^\alpha & e^{2\alpha} & e^{3\alpha} - 1 \\ e^\beta & e^{2\beta} & e^{3\beta} - 1 \\ e^\gamma & e^{2\gamma} & e^{3\gamma} - 1 \end{vmatrix} =$

- A) e^{-1}
- B) e
- C) e^2
- D) e^3
- E) 0

Correct Answer : Option E

21. If the points $(2,-3)$, $(x,1)$ and $(0,5)$ are collinear, then the value of x is

- A) 2
- B) -2
- C) -1
- D) 1
- E) 0

Correct Answer : Option D

22. If x satisfies the inequality $\frac{x-3}{x-5} > 3$ then x lies in the interval

- A) (3,8)
- B) (0,5)
- C) (5,6)
- D) $(-\infty, 3)$
- E) (5,8)

Correct Answer : Option C

23. The solution set of the inequation $\left| \frac{1}{x} - 2 \right| < 4$ is

- A) $\left(-\infty, \frac{-1}{2}\right) \cup \left(\frac{1}{6}, \infty\right)$
- B) $\left(-\infty, \frac{-1}{2}\right)$
- C) $\left(\frac{1}{6}, \infty\right)$
- D) $\left(-\infty, \frac{1}{6}\right) \cup \left(\frac{1}{2}, \infty\right)$
- E) $(-\infty, -\infty)$

Correct Answer : Option A

24. If $\cos x = \frac{4}{5}$, where $x \in \left[0, \frac{\pi}{2}\right]$, then the value of $\cos\left(\frac{x}{2}\right)$ is equal to

- A) $\frac{1}{\sqrt{10}}$
- B) $\frac{-1}{\sqrt{10}}$
- C) $\frac{3}{\sqrt{10}}$
- D) $\frac{\sqrt{3}}{1}$
- E) $\frac{-3}{\sqrt{10}}$

Correct Answer : Option C

25. The value of $\sin \frac{5\pi}{12} \sin \frac{\pi}{12}$ is equal to

- A) 1
- B) $\frac{1}{4}$
- C) $\frac{1}{2}$
- D) $\frac{\sqrt{3}}{2}$
- E) 0

Correct Answer : Option B

26. $\frac{1 - \sin^6\theta - \cos^6\theta}{\cos^2 2\theta} =$

- A) $\frac{1}{4} \tan^2 2\theta$
- B) $\frac{1}{2} \tan^2 2\theta$
- C) $\frac{3}{2} \tan^2 2\theta$
- D) $\frac{3}{4} \tan^2 2\theta$
- E) $\tan^2 2\theta$

Correct Answer : Option D

27. If $\frac{\cos A}{\cos B} = \alpha$, then $\frac{\alpha + 1}{\alpha - 1}$ is equal to

- A) $\cot\left(\frac{A+B}{2}\right)\cot\left(\frac{A-B}{2}\right)$
- B) $-\cot\left(\frac{A+B}{2}\right)\tan\left(\frac{A-B}{2}\right)$
- C) $-\tan\left(\frac{A+B}{2}\right)\cot\left(\frac{A-B}{2}\right)$
- D) $-\cot\left(\frac{A+B}{2}\right)\cot\left(\frac{A-B}{2}\right)$
- E) $-\cot\left(\frac{A+B}{2}\right)$

Correct Answer : Option D

28. If $\tan^{-1}2x + \tan^{-1}3x = \frac{\pi}{4}$, then the value of x is equal to

- A) $\frac{1}{6}$
- B) $\frac{1}{4}$
- C) $\frac{1}{3}$
- D) $\frac{1}{2}$
- E) 1

Correct Answer : Option A

29. The domain of the function $f(x) = \cos^{-1}\left(\left[x \right]\right)$ (where $[x]$ denotes the greatest integer function) is

- A) $[-1,2]$
- B) $[-1,2)$
- C) $(-2,2)$
- D) $(-2,1)$
- E) $(-1,1)$

Correct Answer : Option B

30. If $\sin^{-1}\left(\frac{3\sin 2\alpha}{5+4\cos 2\alpha}\right) = \frac{\pi}{2}$, then $3\sin 2\alpha - 4\cos 2\alpha$ is equal to

- A) 3
- B) 6
- C) 4
- D) 1
- E) 5

Correct Answer : Option E

- 31.** If the angle between two lines is $\frac{\pi}{4}$ and the slope of one of the lines is $\frac{1}{2}$, then the slope of other line is
- A) 3 or $\frac{-1}{3}$
 B) 2 or $\frac{-1}{2}$
 C) 1 or -1
 D) -3 or 2
 E) 3 or $\frac{1}{2}$

Correct Answer : Option A

- 32.** If a straight line passes through the points $\left(\frac{-1}{2}, 1\right)$ and $(1, 2)$, then its y -intercept is
- A) 4
 B) 3
 C) -4
 D) $\frac{-4}{3}$
 E) $\frac{4}{3}$

Correct Answer : Option E

- 33.** If the base of an equilateral triangle is along the straight line $2x - y = 1$ and the opposite vertex is $(-1, 2)$, then the length of the side of the triangle is
- A) $\frac{20}{3}$ units
 B) $2\sqrt{\frac{5}{3}}$ units
 C) $\frac{\sqrt{20}}{3}$ units
 D) $\frac{2}{\sqrt{15}}$ units
 E) $\sqrt{\frac{3}{20}}$ units

Correct Answer : Option B

- 34.** A circle passes through $(4, 0)$ and $(0, 2)$ with centre on the y -axis. The radius of the circle is
- A) 5
 B) 10
 C) 15
 D) 20
 E) 25

Correct Answer : Option A

35. If the length of major axis of an ellipse is twice the length of minor axis, then its eccentricity is equal to

- A) $\frac{\sqrt{2}}{3}$
- B) $\frac{\sqrt{3}}{2}$
- C) $\frac{1}{\sqrt{2}}$
- D) $\frac{2}{3}$
- E) $\frac{2\sqrt{2}}{3}$

Correct Answer : Option B

36. The lengths of the transverse axis and conjugate axis of the hyperbola $\frac{x^2}{9} - \frac{y^2}{25} = 1$ respectively, are

- A) 3,5
- B) 4,5
- C) 6,10
- D) 9,25
- E) 6,5

Correct Answer : Option C

37. The equation of the directrix of the parabola $(x - 1)^2 = 2(y - 2)$ is

- A) $2y - 3 = 0$
- B) $2y + 3 = 0$
- C) $3y - 2 = 0$
- D) $3y + 2 = 0$
- E) $2x - 1 = 0$

Correct Answer : Option A

38. The vectors $-\hat{i} + \frac{1}{4}\hat{j} + 2\hat{k}$ and $\hat{i} + \frac{1}{4}\hat{j} + 2\hat{k}$, are the adjacent sides of a parallelogram. The area of the parallelogram is

- A) $\frac{\sqrt{65}}{4}$
- B) $\sqrt{65}$
- C) $\sqrt{\frac{65}{2}}$
- D) $\frac{\sqrt{65}}{2}$
- E) $\frac{\sqrt{65}}{3}$

Correct Answer : Option D

39. Let the vectors \vec{a} and \vec{b} be such that $|\vec{a}| = 3$ and $|\vec{b}| = \frac{\sqrt{2}}{3}$. If $\vec{a} \times \vec{b}$ is a unit vector, then the angle between \vec{a} and \vec{b}
- A) $\frac{\pi}{3}$
 B) $\frac{\pi}{4}$
 C) $\frac{\pi}{6}$
 D) $\frac{\pi}{2}$
 E) $\frac{3\pi}{4}$

Correct Answer:-Question Cancelled

40. The projection of the vector $\vec{a} = 3\hat{i} - \hat{j} - 2\hat{k}$ on $\vec{b} = \hat{i} + 2\hat{j} - 3\hat{k}$ is
- A) $\frac{\sqrt{14}}{2}$
 B) $\frac{14}{\sqrt{2}}$
 C) $\sqrt{14}$
 D) $14\sqrt{2}$
 E) $2\sqrt{14}$

Correct Answer : Option A

41. If $|\vec{a}| = 4$ and $-1 \leq \lambda \leq 3$, then $|\lambda\vec{a}|$ lies in the interval
- A) [1,4]
 B) [1,3]
 C) [4,14)
 D) (3,12)
 E) [4,12]

Correct Answer:-Question Cancelled

42. Question42 :- The angle between the lines $\vec{r} = (3\hat{i} + 2\hat{j} - 4\hat{k}) + \lambda(\hat{i} + 2\hat{j} + 2\hat{k})$ and $\vec{r} = (5\hat{i} - 2\hat{j}) + \mu(3\hat{i} + 2\hat{j} + 6\hat{k})$ is
- A) $\cos^{-1}\left(\frac{9}{13}\right)$
 B) $\cos^{-1}\left(\frac{3}{19}\right)$
 C) $\cos^{-1}\left(\frac{19}{21}\right)$
 D) $\cos^{-1}\left(\frac{13}{17}\right)$
 E) $\cos^{-1}\left(\frac{3}{17}\right)$

Correct Answer : Option C

43. The equation of line joining the points $(-3,4,11)$ and $(1,-2,7)$ is

- A) $\frac{x+3}{2} = \frac{y-4}{3} = \frac{z-11}{4}$
 B) $\frac{x+3}{-2} = \frac{y-4}{3} = \frac{z-11}{2}$
 C) $\frac{x+3}{-2} = \frac{y+4}{3} = \frac{z+11}{4}$
 D) $\frac{x+3}{2} = \frac{y+4}{-3} = \frac{z+11}{2}$
 E) $\frac{x+3}{-2} = \frac{y-4}{-3} = \frac{z-11}{-4}$

Correct Answer : Option B

44. The lines $\frac{x-1}{2} = \frac{y+1}{-3} = \frac{z+10}{8}$ and $\frac{x-4}{1} = \frac{y+3}{k} = \frac{z+1}{7}$ are coplanar. Then the value of k is

- A) 0
 B) -2
 C) 2
 D) 4
 E) -4

Correct Answer : Option E

Which one of the following points lies on the line

45. $\vec{r} = (\hat{i} + 2\hat{j} - 3\hat{k}) + t(4\hat{i} + 5\hat{j} - 7\hat{k}), t \in \mathbb{R}$?

- A) $(9,12,-15)$
 B) $(9,15,12)$
 C) $(12,9,-17)$
 D) $(9,12,-17)$
 E) $(-9,-12,17)$

Correct Answer : Option D

46. If the mean of $12 + x$, $17 + x$, $25 + x$, $34 + x$ is 22 then the mean of $38 + x$, $42 + x$, $52 + x$, $60 + x$ is

- A) 42
 B) 22
 C) 48
 D) 46
 E) 50

Correct Answer : Option C

47. The standard deviation of 3, 8, 6, 10, 12, 9, 11, 10, 12, 7 is 2.71. The standard deviation of 30, 80, 60, 100, 120, 90, 110, 100, 120, 70 is

- A) 2.17
 B) 0.271

- C) 27.1
- D) 271
- E) $2.71\sqrt{10}$

Correct Answer : Option C

48. If A and B are mutually exclusive events and $P(B) = \frac{1}{5}$, $P(A \cup B) = \frac{13}{35}$, then $P(A)$ is equal to
- A) $\frac{1}{35}$
 - B) $\frac{3}{35}$
 - C) $\frac{1}{7}$
 - D) $\frac{6}{35}$
 - E) $\frac{1}{5}$

Correct Answer : Option D

49. If A and B are two independent events and $P(A') = 0.8$, $P(B) = 0.6$, then $P(A \cup B)$ is equal to
- A) 0.86
 - B) 0.8
 - C) 0.68
 - D) 0.52
 - E) 0.48

Correct Answer : Option C

50. $\lim_{x \rightarrow 1} \frac{(x + x^2 + x^3 + x^4 + x^5) - 5}{x - 1} =$
- A) 5
 - B) 12
 - C) 14
 - D) 0
 - E) 15

Correct Answer : Option E

51. $\lim_{x \rightarrow 0} \frac{\sin 2x + 3x}{4x + \sin 6x} =$
- A) 1
 - B) $\frac{1}{4}$
 - C) $\frac{1}{2}$
 - D) 2
 - E) 3

Correct Answer : Option C

- 52.** The domain of $f(x) = \sqrt{|x| - 1} + \sqrt{4 - |x|}$ is
- A) $[-4, -1] \cup (1, 4)$
 - B) $(-4, -1) \cup (1, 4)$
 - C) $[-4, -1]$
 - D) $[-4, -1) \cup (1, 4)$
 - E) $[-4, -1] \cup [1, 4]$

Correct Answer : Option E

- 53.** The range of $f(x) = \sin x + \cos x + 3$
- A) $[-1 + \sqrt{3}, 1 + \sqrt{3}]$
 - B) $[-\sqrt{2} + 3, \sqrt{2} + 3]$
 - C) $[-\sqrt{3} + 3, 3 + \sqrt{3}]$
 - D) $[-\sqrt{2} - 3, 2 + \sqrt{3}]$
 - E) $[-2 + \sqrt{3}, 2 + \sqrt{3}]$

Correct Answer : Option B

- 54.** If $F(x) = -\sqrt{9 - x^2}$, then $\lim_{x \rightarrow 1} \frac{F(x) - F(1)}{x - 1} =$ is equal to
- A) $\frac{1}{2}$
 - B) $\frac{1}{\sqrt{2}}$
 - C) $\frac{-1}{2\sqrt{2}}$
 - D) $\frac{1}{2\sqrt{2}}$
 - E) 1

Correct Answer : Option D

- 55.** If $\log_2 y = x$, then $\frac{dy}{dx}$ is equal to
- A) $2^x \log_e 2$
 - B) 2^x
 - C) x^2
 - D) $2x$
 - E) $\frac{2^x}{\log_e y}$

Correct Answer : Option A

56. The derivative of $y = (x - 1)(2x - 1)(3 - x)(4 - x)$ at $x = \frac{1}{2}$ is equal to
- A) 35
 B) $\frac{-35}{4}$
 C) $\frac{-35}{2}$
 D) $\frac{35}{4}$
 E) $\frac{35}{2}$

Correct Answer : Option B

57. If $f(x) = |\cos x - \sin x|$, then $f'\left(\frac{\pi}{6}\right)$ is equal to
- A) $\frac{-(\sqrt{3} + 1)}{2}$
 B) $\frac{(\sqrt{3} + 1)}{2}$
 C) $\frac{\sqrt{3}}{2}$
 D) $\frac{2}{\sqrt{3}}$
 E) $\frac{2}{\sqrt{3} + 1}$

Correct Answer : Option A

58. Let $f: (0, \infty) \rightarrow R$ and $F(x) = \int_0^x f(t)dt$. If $F(x) = x^2(1 + x)$, then $f(2)$ is equal to
- A) -4
 B) 4
 C) -16
 D) 16
 E) 12

Correct Answer : Option D

59. If $f(x) = |x^2 - 1|$, then $f'\left(\frac{3}{2}\right)$ is equal to
- A) 3
 B) 1
 C) 4
 D) $\frac{3}{2}$
 E) 2

Correct Answer : Option A

60. A critical point of the function $f(x) = \frac{x^3}{3} + 3x^2 - 7x$, is

- A) $\left(1, \frac{-11}{3}\right)$
- B) $(0,0)$
- C) $\left(-1, \frac{29}{3}\right)$
- D) $\left(2, \frac{2}{3}\right)$
- E) $\left(-2, \frac{70}{3}\right)$

Correct Answer : Option A

61. The function $f(x) = 2x^3 + 9x^2 + 12x - 1$ is decreasing in the interval is

- A) $(-1,1)$
- B) $(-3,1)$
- C) $(-2,-1)$
- D) $[-2,1]$
- E) $(-1,3)$

Correct Answer : Option C

62. The radius of a right circular cylinder is increasing at the rate of 2 cm/s and its height is decreasing at the rate of 3 cm/s. The rate of change of volume when radius is 4 cm and height 6 cm, is (in cm^3/s)

- A) 24π
- B) 28π
- C) 42π
- D) 44π
- E) 48π

Correct Answer : Option E

63. The sum of two positive numbers is 12. If the sum of whose square is minimum, then the numbers are

- A) 3,9
- B) 4,8
- C) 5,7
- D) 6,6
- E) 2,10

Correct Answer : Option D

64. $\int \frac{dx}{\sqrt{x} + \sqrt{x-2}}$ is equal to

- A) $\frac{1}{2} \left(x^{3/2} - (x-1)^{3/2} \right) + C$
- B) $\frac{1}{3} \left(x^{3/2} - (x-2)^{3/2} \right) + C$

- C) $\frac{1}{3} \left(x^{2/3} - (1-x)^{2/3} \right) + C$
 D) $\frac{1}{2} \left(x^{2/3} - (1-x)^{2/3} \right) + C$
 E) $\frac{1}{3} \left(x^{2/3} - (x-2)^{2/3} \right) + C$

Correct Answer : Option B

65. $\int \frac{dx}{\cos x \sqrt{2 \sin 2x}} =$
 A) $\frac{1}{2} \sqrt{\tan x} + C$
 B) $\sqrt{\tan x} + C$
 C) $2\sqrt{\tan x} + C$
 D) $4\sqrt{\tan x} + C$
 E) $3\sqrt{\tan x} + C$

Correct Answer : Option B

66. If $f'(x) = 3x^2 - \frac{2}{x^3}$ and $f(1) = 0$, then $f(x) =$
 A) $x^2 + \frac{1}{x^3} + 1$
 B) $x^3 + \frac{1}{x^2} + 1$
 C) $x^3 + \frac{1}{x^2} + 2$
 D) $x^3 + \frac{1}{x^2} - 2$
 E) $x^3 + \frac{1}{x^2} - 1$

Correct Answer : Option D

67. $\int \left[\frac{1}{\log x} - \frac{1}{(\log x)^2} \right] dx =$
 A) $\log x + C$
 B) $x \log x + C$
 C) $\frac{\log x}{x} + C$
 D) $\frac{x}{\log x} + C$
 E) $x + \log x + C$

Correct Answer : Option D

68. $\int \sqrt{x^2 + 2x + 3} dx =$
 A) $(x+1)\sqrt{x^2 + 2x + 3} + \log |(x+1) + \sqrt{x^2 + 2x + 3}| + C$
 B) $\frac{x+1}{2}\sqrt{x^2 + 2x + 3} - \log |(x+1) + \sqrt{x^2 + 2x + 3}| + C$

- C) $\frac{x+1}{2}\sqrt{x^2+2x+3} - \frac{1}{2}\log|(x+1) - \sqrt{x^2+2x+3}| + C$
- D) $\frac{x+1}{2}\sqrt{x^2+2x+3} + \log|(x+1) + \sqrt{x^2+2x+3}| + C$
- E) $\frac{x+1}{2}\sqrt{x^2+2x+3} + \frac{1}{2}\log|(x+1) - \sqrt{x^2+2x+3}| + C$

Correct Answer : Option D

69. $\int_3^5 \frac{e^{(1+x^2)}}{e^{(1+x^2)} + e^{(1+(8-x)^2)}} dx =$

- A) 5
- B) 1
- C) 2
- D) 3
- E) 0

Correct Answer : Option B

70. $\int_{-a}^a (x^3 + x \cos^2 2x + \tan^3 x + 3) dx =$

- A) 2a
- B) 3a
- C) 4a
- D) 6a
- E) a

Correct Answer : Option D

71. The area bounded by the curve $y = 3x - x^2$ and the x -axis is

- A) $\frac{21}{2}$ sq.units
- B) 18 sq.units
- C) $\frac{27}{2}$ sq.units
- D) 9 sq.units
- E) $\frac{9}{2}$ sq.units

Correct Answer : Option E

72. Area of the region bounded by $y = |x|$ and $x = 4$ is

- A) 4 sq.units
- B) 6 sq.units
- C) 8 sq.units
- D) 12 sq.units
- E) 13 sq.units

Correct Answer : Option C

73. The order and degree of differential equation $\sqrt[5]{1 + \frac{d^2y}{dx^2}} = \sqrt[4]{\left(y + \left(\frac{dy}{dx}\right)^5\right)}$, respectively, are
- A) 2,5
 B) 2,4
 C) 2,3
 D) 4,5
 E) 4,4

Correct Answer : Option B

74. The order and degree of differential equation $x \frac{dy}{dx} + y = e^x$ is
- A) $y = \frac{e^x}{x} + Cx$
 B) $y = xe^x + Cx$
 C) $y = \frac{e^x}{x} + C$
 D) $y = \frac{e^x}{x} + \frac{C}{x}$
 E) $y = \frac{1}{x} + Cxe^x$

Correct Answer:-Question Cancelled

75. Let $z = ax + by$, where $a, b > 0$. The corner points of the feasible region determined by the system of linear constraints are $(0, 10)$, $(5, 5)$, $(15, 15)$, $(0, 20)$. Condition on a and b so that the minimum of z occurs at both the points $(15, 15)$ and $(0, 20)$, is
- A) $a = b$
 B) $2a = b$
 C) $a = 2b$
 D) $3a = b$
 E) $a = 3b$

Correct Answer : Option D

76. A distance of 50 cm is measured using a metre stick with the smallest division 1 mm. The percentage error involved in the measurement is
- A) 2%
 B) 0.5%
 C) 0.2%
 D) 0.1%
 E) 5%

Correct Answer : Option C

77. The value of $(200\text{ m} + 200\text{ mm})$ with regard to significant figures is
- A) 200.2 m
 B) 200 m
 C) 202 m
 D) 200.200 m
 E) 202.2 m

Correct Answer : Option B

78. The angle subtended by the vector $\vec{A} = \hat{i} + \hat{j} + \hat{k}$ with the y -axis is

- A) $\cos^{-1}\left(\frac{2}{\sqrt{3}}\right)$
- B) $\sin^{-1}\left(\frac{1}{\sqrt{3}}\right)$
- C) $\cos^{-1}\left(\frac{1}{\sqrt{3}}\right)$
- D) $\sin^{-1}\left(\frac{2}{\sqrt{3}}\right)$
- E) $\frac{\pi}{2}$

Correct Answer : Option C

79. When a body with its initial velocity non-zero, moves with constant retardation, the velocity-time graph is

- A) an oblique straight line with positive slope
- B) a straight line parallel to time axis
- C) a straight line parallel to velocity axis
- D) an oblique straight line with negative slope
- E) a curve with bend upwards

Correct Answer : Option D

80. If two bodies are projected with angles of projection θ and $(90 - \theta)$ with the same speed, then the ratio between their times of flight T_1 and T_2 is

- A) $\cot \theta$
- B) $\cos \theta$
- C) $\sec \theta$
- D) $\sin \theta$
- E) $\tan \theta$

Correct Answer : Option E

81. A machine gun having mass 5 kg fires 40 gram bullet at the rate of 25 bullets per minute at a speed of 300 ms^{-1} . The force required to keep the gun in position is

- A) 7 N
- B) 4 N
- C) 2.5 N
- D) 10 N
- E) 5 N

Correct Answer : Option E

82. A force $\vec{F} = \hat{i} + 2\hat{j} - 2\hat{k}$ applied on a body, accelerates the body with 2 ms^{-2} . Then the mass of the body is
- A) 0.5 kg
 - B) 10 kg
 - C) 5 kg
 - D) 1.5 kg
 - E) 7 kg

Correct Answer : Option D

83. A body moving with kinetic energy E is stopped by applying a stopping force F . The stopping distance is
- A) FE
 - B) $\frac{F}{E}$
 - C) $\frac{E}{F}$
 - D) F^2E
 - E) FE^2

Correct Answer : Option C

84. The work done by the applied force in changing the elongation of a spring of spring constant K , from x_1 to x_2 is
- A) $\frac{1}{2}K(x_2^2 - x_1^2)$
 - B) $\frac{1}{2}Kx_1x_2$
 - C) $\frac{1}{4}K(x_1^2 - x_2^2)$
 - D) $\frac{1}{4}Kx_1x_2$
 - E) $\frac{1}{2}K(x_1^2x_2^2)$

Correct Answer : Option A

85. In the uniform circular motion of a particle, the point about which the angular momentum of the particle is conserved is
- A) on the circumference of the circle
 - B) inside the circle
 - C) outside the circle
 - D) the centre of the circle
 - E) anywhere on the rotation axis

Correct Answer : Option D

86. A wheel of moment of inertia $4 \times 10^{-3} \text{ kgm}^2$ rotates with an angular speed of 25 rev. s^{-1} . The torque (in Nm) required to stop it in 10s is
- A) $4\pi \times 10^{-4}$
 - B) $2\pi \times 10^{-2}$

- C) $6\pi \times 10^{-3}$
- D) $\pi \times 10^{-1}$
- E) $3\pi \times 10^{-5}$

Correct Answer : Option B

- 87.** A force \vec{F} acting on a particle, having position vector \vec{r} exerts a torque $\vec{\tau}$ about the origin on the particle. Then the angle between \vec{r} and $\vec{\tau}$ is
- A) 60°
 - B) 45°
 - C) 0°
 - D) 90°
 - E) 180°

Correct Answer : Option D

- 88.** The gravitational potential energy between two bodies each of mass 1 kg kept at a distance of 1 m is (G - Gravitational constant)
- A) G
 - B) $-G$
 - C) $\frac{-G}{2}$
 - D) $\frac{G}{2}$
 - E) $\frac{-G}{4}$

Correct Answer : Option B

- 89.** If the acceleration due to gravity on the surface of a planet of mass m and radius r is g , then the escape velocity of a body from the surface of the planet is
- A) $\sqrt{2gr}$
 - B) $\sqrt{\frac{2g}{r}}$
 - C) \sqrt{gr}
 - D) gr^2
 - E) $2gr^2$

Correct Answer : Option A

- 90.** The wall between two thermal systems that allows the flow of heat from one to another to bring thermal equilibrium is called
- A) adiabatic wall
 - B) insulated wall
 - C) diathermic wall
 - D) semiconducting wall
 - E) non-conducting wall

Correct Answer : Option C

- 91.** If dV is the change in volume of a liquid of density ρ under the pressure P , then the pressure energy per unit mass of the liquid is
- A) PdV
 B) $\frac{PdV}{\rho}$
 C) $\frac{PdV}{\rho^2}$
 D) $\frac{P}{\rho}$
 E) $P\rho$

Correct Answer : Option D

- 92.** If F_1 is the force exerted by air on a small piston of area of cross-section A_1 in a car lift, then the force F_2 realised on the second piston of area of cross-section A_2 due to the transfer of pressure is
- A) $F_1 \frac{A_1}{A_2}$
 B) $F_1 \frac{A_2}{A_1}$
 C) $F_1 \sqrt{(A_1 A_2)}$
 D) $F_1 \sqrt{\frac{A_1}{A_2}}$
 E) $\sqrt{\frac{A_1}{A_2}}$

Correct Answer : Option B

- 93.** Find the mismatch pair in the thermodynamic process
- A) Isothermal : Absorption or emission of heat
 B) Isobaric : Pressure constant
 C) Isochoric : Volume constant
 D) Irreversible : Loss of heat
 E) Adiabatic : Heat exchange

Correct Answer : Option E

- 94.** In a Carnot engine if the ratio of the heat rejected to the sink to the heat absorbed from the source is 1 : 4, then the efficiency of the engine is
- A) 75 %
 B) 60 %
 C) 50 %
 D) 25 %
 E) 45 %

Correct Answer : Option A

95. The mean free path of a gas is directly proportional to its

- A) pressure
- B) density
- C) molecular diameter
- D) absolute temperature
- E) square of molecular diameter

Correct Answer : Option D

96. The condition for real gases to obey the ideal gas equation $PV = RT$ is that the gases should be at

- A) high pressure
- B) low temperature
- C) low pressure and low temperature
- D) high pressure and low temperature
- E) low pressure and high temperature

Correct Answer : Option E

97. A particle is executing simple harmonic motion with A and B as its extreme positions and O as its mean position. If a and v represent the acceleration and velocity, then

- A) at A , $a = 0$
- B) at B , $a = 0$
- C) at O , a is maximum
- D) at O , a and v are maximum
- E) at O , $a = 0$

Correct Answer : Option E

98. The equation for the displacement x (in m) of a particle executing simple harmonic motion in SI unit is $x(t) = 5\cos 4\pi t$. Its displacement after 3 s is

- A) 2 m
- B) 5 m
- C) 3 m
- D) 4 m
- E) 10 m

Correct Answer : Option B

99. Two sound sources produce 24 beats in 3 s. The difference between the two frequencies of the sources is

- A) 2
- B) 4
- C) 8
- D) 12
- E) 3

Correct Answer : Option C

- 100.** Electric potential due to an electric dipole on its axis at a distance r from its centre is inversely proportional to
- A) r
 - B) r^3
 - C) r^2
 - D) r^{-2}
 - E) r^{-1}

Correct Answer : Option C

- 101.** If the potential difference between two conductors separated by a distance of 2 cm is 4×10^3 V then the electric field between them (in Vm^{-1}) is
- A) $8 \times 10^3Vm^{-1}$
 - B) $4 \times 10^5Vm^{-1}$
 - C) $8 \times 10^5Vm^{-1}$
 - D) $2 \times 10^3Vm^{-1}$
 - E) $2 \times 10^5Vm^{-1}$

Correct Answer : Option E

- 102.** The electrostatic energy density of the electric field E in a capacitor is directly proportional to
- A) E^2
 - B) E
 - C) \sqrt{E}
 - D) E^3
 - E) E^{-2}

Correct Answer : Option A

- 103.** In an electrolyte, the mobile charge carriers are
- A) electrons only
 - B) negative ions only
 - C) positive ions only
 - D) negative and positive ions
 - E) electrons and positive ions

Correct Answer : Option D

- 104.** If both the length and area of cross-section of a linear conductor are halved, its resistance would
- A) be doubled
 - B) remain unchanged
 - C) be halved
 - D) be tripled
 - E) be quadrupled

Correct Answer : Option B

- 105.** The power dissipated in the transmission cables of 0.03Ω resistance, when 11 kW of power is transmitted at 220 V is
- A) 0.025 kW
 - B) 0.050 kW
 - C) 0.075 kW
 - D) 1.075 kW
 - E) 1.025 kW

Correct Answer : Option C

- 106.** If the horizontal and the vertical component of earth's magnetic field are, respectively, $0.26 G$ and $(0.26) \sqrt{3} G$, then the dip angle is
- A) 0°
 - B) 30°
 - C) 45°
 - D) 60°
 - E) 90°

Correct Answer : Option D

- 107.** The maximum torque experienced by a rectangular coil carrying a steady current I placed in a uniform magnetic field B is (l - length; A - area of cross-section)
- A) IBA
 - B) IlB
 - C) IBA^2
 - D) IlB^2
 - E) Il^2B

Correct Answer : Option A

- 108.** In a television, the required magnetic field is produced by a/an
- A) toroid
 - B) electromagnet
 - C) permanent magnet
 - D) circular coil
 - E) solenoid

Correct Answer:-Question Cancelled

- 109.** If the flux linked with the coil of area of cross-section 0.5 m^2 placed in a magnetic field of $16 T$ is 4 Wb , then the angle between the magnetic field and the area vector of the coil is
- A) 0°
 - B) 30°
 - C) 45°
 - D) 60°
 - E) 90°

Correct Answer : Option D

110. The self-inductance of a coil does not depend on

- A) its radius
- B) its number of turns
- C) its area of cross-section
- D) the current through it
- E) permeability of the medium

Correct Answer : Option D

111. Which one of the following proves the transverse nature of electromagnetic waves?

- A) Interference of light
- B) Dispersion of light
- C) Polarization of light
- D) Photoelectric effect
- E) Diffraction of light

Correct Answer : Option C

112. If the angle of a prism A is equal to the angle of minimum deviation, then the refractive index of the material of the prism is

- A) $2\cos\frac{A}{2}$
- B) $\cos\frac{A}{2}$
- C) $2\cos A$
- D) $\cos A$
- E) $\sin\frac{A}{2}$

Correct Answer : Option A

113. According to Huygens Principle, a wavefront is

- A) a single ray of light
- B) a surface of constant phase
- C) a surface of varying phase
- D) a random arrangement of waves
- E) a region where crests and troughs overlap

Correct Answer : Option B

114. In Young's experiment, the wavelength of light is 600 nm , the slit separation is 0.5 mm , and the screen is 2 m away. The fringe width of the interference pattern with the same set up becomes 3 times if the wavelength of light used is

- A) tripled
- B) doubled
- C) halved
- D) made one-third

E) made one-sixth

Correct Answer : Option A

115. If the frequency of the incident radiation f increases above the threshold frequency f_0 of a photo-sensitive material, then the stopping potential

- A) increases linearly with f
- B) decreases linearly with f
- C) is independent of f
- D) increases with intensity of light
- E) decreases with intensity of light

Correct Answer : Option A

116. The emission of electrons from a metal by applying a very strong electric field is called

- A) photoelectric emission
- B) field emission
- C) thermionic emission
- D) beta emission
- E) gamma emission

Correct Answer : Option B

117. The size of a nucleus is of the order of

- A) $10^{-15}m$
- B) $10^{-10}m$
- C) $10^{-5}m$
- D) $10^{-6}m$
- E) $10^{10}m$

Correct Answer:-Question Cancelled

118. The radiations of extremely short wavelength are

- A) alpha rays
- B) beta rays
- C) gamma rays
- D) X rays
- E) ultra-violet rays

Correct Answer : Option C

119. The naturally occurring crystal which was used as a detector of radio waves is

- A) Ruby
- B) Galena
- C) silicon
- D) germanium
- E) zinc selenide

Correct Answer : Option B

- 120.** If n_h and n_e represent the concentrations of holes and electrons, respectively, then in a p-type semiconductor,
- A) $n_e = n_h$
 - B) $n_e \gg n_h$
 - C) $n_h \gg n_e$
 - D) $n_e = 2n_h$
 - E) $n_h + n_e = n_h n_e$

Correct Answer : Option C

- 121.** 149 g of KCl is dissolved in 10 litres of an aqueous solution. The molarity of the solution is (molar mass of $KCl = 74.5$)
- A) 1M
 - B) 0.1M
 - C) 2 M
 - D) 0.2M
 - E) 0.002 M

Correct Answer : Option D

- 122.** Which of the following statement is NOT true?
- A) The energies of the orbitals in the same subshell increases with increase in the atomic number
 - B) The probability density function is zero on the plane where the two lobes touch each other.
 - C) The lower the value of $(n + l)$ for an orbital, the lower is its energy.
 - D) The total number of nodes is given by $(n - 1)$.
 - E) The maximum number of electrons in the shell with principal quantum number ' n ' is equal to ' n^2 '.

Correct Answer : Option E

- 123.** Which of the following quantum numbers determines the orientation of the orbital?
- A) n
 - B) l
 - C) m_l
 - D) m_s
 - E) both n and l

Correct Answer : Option C

- 124.** Which of the following statement is INCORRECT regarding f-block elements?
- A) The elements of the periodic table in which the last electron gets filled up in the f-orbital.
 - B) The f-block elements are from atomic number 58 to 71 and from 90 to 103.
 - C) Actinoid elements are radioactive.
 - D) There are 28 f-block elements in the periodic table.

E) The outer electronic configuration of Actinoids is $(n - 1)f^{1 - 14}(n - 1)d^{0 - 1}ns^2$.

Correct Answer : Option E

125. The H-C-H bond angle in ethene is

- A) 117.6°
- B) 121°
- C) 110°
- D) 105°
- E) 119°

Correct Answer : Option A

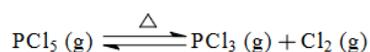
126. For the process to occur under adiabatic conditions, the correct condition is

- A) $\Delta T = 0$
- B) $\Delta P = 0$
- C) $q = 0$
- D) $w = 0$
- E) $\Delta U = 0$

Correct Answer : Option C

For the following gas phase decomposition, the magnitude of ΔH and ΔS is

127.



- A) $\Delta H < 0$ and $\Delta S < 0$
- B) $\Delta H > 0$ and $\Delta S > 0$
- C) $\Delta H > 0$ and $\Delta S < 0$
- D) $\Delta H < 0$ and $\Delta S > 0$
- E) $\Delta H = 0$ and $\Delta S = 0$

Correct Answer : Option B

What is the value of K_c for the following equilibrium, if the value of K_p for the reaction at

128. 1000 K is 8.21×10^{-2} ? ($R = 0.0821$)



- A) 10^{-3}
- B) 10^{-8}
- C) 10^{-9}
- D) 10^{-10}
- E) 10^{-5}

Correct Answer : Option A

129. Which of the following statement is true for the effect of catalyst in equilibrium?

- A) Lowers activation energy for forward reaction only.
- B) Lowers activation energy for reverse reaction only.

- C) When K is small catalyst has greater effect.
- D) It effects to equilibrium composition of reaction mixture.
- E) Lowers activation energy for forward and reverse reaction by same amount.

Correct Answer : Option E

130. Which of the following is INCORRECT for the concept of reduction?

- A) Removal of oxygen
- B) Addition of hydrogen
- C) Addition of electron
- D) Decrease in oxidation number
- E) Removal of an electron

Correct Answer : Option E

131. The conductivity (k) of a decinormal solution of KCl is $0.012 \text{ ohm}^{-1} \text{ cm}^{-1}$. The resistance of a cell containing this solution was found to be 50 ohm at 298 K. The cell constant value is

- A) 0.02 cm^{-1}
- B) 0.5 cm^{-1}
- C) 0.8 cm^{-1}
- D) 0.1 cm^{-1}
- E) 0.6 cm^{-1}

Correct Answer : Option E

132. When 1 g of a non-electrolyte solute dissolved in 50 g of benzene lowered the freezing point of benzene by 0.20 K. The freezing point depression constant of benzene is 5 K kg mol^{-1} . The molar mass (g /mol) of the solute is

- A) 500
- B) 400
- C) 300
- D) 200
- E) 100

Correct Answer : Option A

133. The pre-exponential factor in the Arrhenius equation is called as

- A) probability factor
- B) activation energy
- C) collision frequency
- D) reaction coordinate
- E) frequency factor

Correct Answer : Option E

134. In a first order reaction, $A \rightarrow \text{Products}$, the half-life period is found to be 10 minutes. The rate of the reaction in $\text{mol lit}^{-1} \text{ min}^{-1}$ at $[A] = 0.1 \text{ mol lit}^{-1}$ is

- A) $0.693 \times 10^{-3} \text{ mol lit}^{-1} \text{ min}^{-1}$
 B) $6.93 \times 10^{-3} \text{ mol lit}^{-1} \text{ min}^{-1}$
 C) $69.3 \times 10^{-3} \text{ mol lit}^{-1} \text{ min}^{-1}$
 D) $693.3 \times 10^{-3} \text{ mol lit}^{-1} \text{ min}^{-1}$
 E) $6932 \times 10^{-3} \text{ mol lit}^{-1} \text{ min}^{-1}$

Correct Answer : Option B

The correct statement/s about Cr^{2+} and Mn^{3+} is/are
 [Atomic numbers of Cr = 24 and Mn = 25]

135. (i) Cr^{2+} is a reducing agent
 (ii) Mn^{7+} is an oxidising agent in acidic medium
 (iii) Both Cr^{2+} and Mn^{3+} exhibit d^4 electronic configuration
 (iv) The highest oxide of Mn is Mn_3O_4 .
 (v) Cr^{2+} and Mn^{3+} have the same magnetic moment as both have four unpaired electrons.
- A) Only (i)
 B) (i), (ii) and (iii)
 C) (i), (iv) and (v)
 D) (i) and (v) only
 E) (i), (ii), (iii) and (v)

Correct Answer : Option E

136. Which of the following metal ion is diamagnetic?

- A) Zn^{2+}
 B) Ni^{2+}
 C) Co^{2+}
 D) Cu^{2+}
 E) Mn^{2+}

Correct Answer : Option A

Match the Column-I with Column-II.

- | | Column-I (Catalyst) | (Column-II) Used in |
|------|--|--|
| 137. | (a) $\text{TiCl}_4 + \text{Al}(\text{CH}_3)_3$ | (i) Oxidation of SO_2 in the manufacture of H_2SO_4 . |
| | (b) PdCl_2 | (ii) Hydrogenation of fats |
| | (c) Fe | (iii) Zeigler catalyst |
| | (d) Ni | (iv) Wacker process |
| | (e) V_2O_5 | (v) Haber process |
- A) (a)-(iii), (b)-(iv), (c)-(v), (d)-(ii), (e)-(i)
 B) (a)-(ii), (b)-(iv), (c)-(v), (d)-(iii), (e)-(i)
 C) (a)-(iii), (b)-(ii), (c)-(v), (d)-(iv), (e)-(i)
 D) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii), (e)-(v)
 E) (a)-(iii), (b)-(v), (c)-(iv), (d)-(ii), (e)-(i)

Correct Answer : Option A

138. The common oxidation state of the elements of lanthanoid series is

- A) +1
- B) +2
- C) +3
- D) +4
- E) +5

Correct Answer : Option C

- 139.** The complex ions $[\text{NiCl}_4]^{2-}$ and $[\text{Ni}(\text{CN})_4]^{2-}$ differ by
- (i) Magnetic moment
 - (ii) Geometry
 - (iii) Hybridisation of central metal ion
 - (iv) Oxidation state of nickel
- A) (i), (ii) and (iv)
 - B) (i), (ii) and (iii)
 - C) (ii), (iii) and (iv)
 - D) (ii) and (iii)
 - E) (i), (ii), (iii) and (iv)

Correct Answer : Option B

Four complex ions are given in Column I and the colours of light absorbed are given in Column II. Match the correct answer from the codes given below.

- | 140. Complex | Colour of light absorbed |
|--|---------------------------------|
| (a) $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$ | (i) Blue |
| (b) $[\text{Cu}(\text{H}_2\text{O})_4]^{2+}$ | (ii) Yellow |
| (c) $[\text{CoCl}(\text{NH}_3)_5]^{2+}$ | (iii) Blue green |
| (d) $[\text{Co}(\text{NH}_3)_6]^{3+}$ | (iv) Red |
- A) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
 - B) (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)
 - C) (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)
 - D) (a)-(i), (b)-(iv), (c)-(ii), (d)-(iii)
 - E) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

Correct Answer : Option A

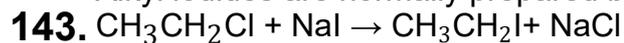
- 141.** The number of α -hydrogens in tertiary butyl chloride, isopropyl chloride, ethyl chloride and methyl chloride are respectively
- A) 0, 1, 2 and 3
 - B) 0, 3, 6 and 9
 - C) 1, 3, 6 and 9
 - D) 9, 6, 3 and 0
 - E) 3, 6, 9 and 12

Correct Answer : Option A

- 142.** The correct order of the rate of β -elimination reaction among the alkyl halides is
- A) Secondary > Tertiary > Primary
 - B) Tertiary > Primary > Secondary
 - C) Tertiary > Secondary > Primary
 - D) Primary > Tertiary > Secondary
 - E) Primary > Secondary > Tertiary

Correct Answer : Option C

Alkyl iodides are normally prepared by the following reaction:

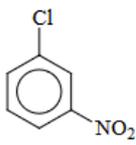
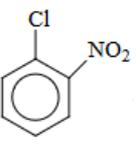
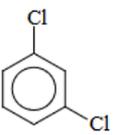
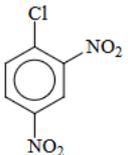


This reaction is known as

- A) Wurtz reaction
- B) Wurtz-Fittig reaction
- C) Williamson synthesis
- D) Finkelstein reaction
- E) Etard reaction

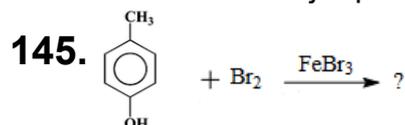
Correct Answer : Option D

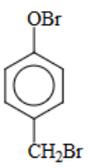
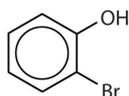
144. Which of the following is most reactive towards nucleophilic aromatic substitution?

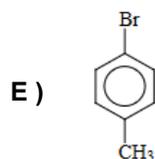
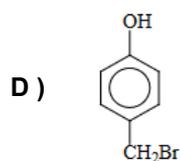
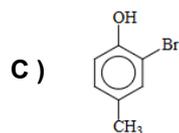
- A) 
- B) 
- C) 
- D) 
- E) 

Correct Answer : Option E

What is the major product of the following reaction?



- A) 
- B) 



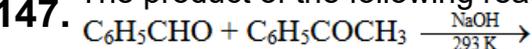
Correct Answer : Option C

146. Benzophenone and Acetophenone are distinguished by treating with

- A) Fehling's reagent
- B) Lucas reagent
- C) Iodine and alkali
- D) Aqueous CrO_3
- E) Tollens' reagent

Correct Answer : Option C

147. The product of the following reaction is



- A) $\text{C}_6\text{H}_5\text{CH}=\text{CHCOC}_6\text{H}_5$
- B) $\text{C}_6\text{H}_5\text{COCH}_2\text{C}_6\text{H}_5$
- C) $\text{C}_6\text{H}_5\text{CH}=\text{CHC}_6\text{H}_5$
- D) $\text{C}_6\text{H}_5\text{CH}(\text{OH})\text{COC}_6\text{H}_5$
- E) $\text{C}_6\text{H}_5\text{COCOC}_6\text{H}_5$

Correct Answer : Option A

148. Which of the following is the strongest acid?

- A) FCH_2COOH
- B) CF_3COOH
- C) $\text{NC-CH}_2\text{COOH}$
- D) $\text{Br-CH}_2\text{COOH}$
- E) CH_3COOH

Correct Answer : Option B

Choose the correct combinations for the column I with column II.

- | Column-I | Column-II |
|---|-----------------------------------|
| 149. (a) Benzenesulphonyl chloride | (i) Carbylamine reaction |
| (b) Conversion of amide to amine | (ii) Secondary amine |
| (c) Conversion of primary amine to isocyanide | (iii) Hinsberg's reagent |
| (d) Diethylamine | (iv) Hofmann's bromamide reaction |

- A) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
- B) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)
- C) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)
- D) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)
- E) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)

Correct Answer : Option C

150. Peptide on hydrolysis gives

- A) glucose
- B) fatty acids
- C) amino acids
- D) ribose sugar, H_3PO_4 and base
- E) heterocyclic base and sugar

Correct Answer : Option C