

FINAL ANSWER KEY

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1. The relation $R = \{(1, 3), (2, 3), (2, 4), (3, 1), (4, 4), (4, 1)\}$ on the set $X = \{1, 2, 3, 4\}$ is
- A) a 1-1 function
 - B) reflexive
 - C) transitive
 - D) not symmetric
 - E) an onto function

Correct Answer : Option D

2. If two sets A and B are having 11 elements in common, then the number of elements common to $A \times B$ and $B \times A$
- A) 121
 - B) 22
 - C) 99
 - D) 11
 - E) 33

Correct Answer : Option A

3. The domain of the function $f(x) = \sqrt{x^2 + x - 2}$ is
- A) $(-\infty, -2) \cup [1, \infty)$
 - B) $(-\infty, -2] \cup (1, \infty)$
 - C) $(-\infty, -2) \cup (1, \infty)$
 - D) $(-\infty, -2] \cup [1, \infty)$
 - E) $(-\infty, 1) \cup [0, \infty)$

Correct Answer : Option D

4. The range of the function $f(x) = \sqrt{x^2 + 4x + 4}$ is
- A) $[0, \infty)$
 - B) $[1, \infty)$
 - C) $[3, \infty)$
 - D) $[2, \infty)$
 - E) $[4, \infty)$

Correct Answer : Option A

5. Let s, t, r be non-zero distinct positive real numbers. If the complex number $z = x + iy$ satisfies $sz + t\bar{z} + r = 0$, then z lies on
- A) imaginary axis
 - B) real axis
 - C) $y = x$
 - D) $y = 2x$
 - E) $x + y = 0$

Correct Answer : Option B

6. Let $z = x + iy$ be a complex number, where $i = \sqrt{-1}$ is the complex unit. Then $|z - 1 + i| = 5$ is a circle with
- A) centre at $(-1, 1)$ and radius 5
 - B) centre at $(1, 1)$ and radius $\sqrt{5}$
 - C) centre at $(-1, -1)$ and radius $\sqrt{5}$
 - D) centre at $(1, 1)$ and radius 25
 - E) centre at $(1, -1)$ and radius 5

Correct Answer : Option E

7. Let z be a complex number such that $z^3 + iz^2 - iz + 1 = 0$ where $i^2 = -1$. Then $|z| =$
- A) 2
 - B) $\frac{1}{2}$
 - C) 1
 - D) $\frac{1}{4}$
 - E) 3

Correct Answer : Option C

8. Real part of $\frac{1 + \sin \frac{2\pi}{27} - i \cos \frac{2\pi}{27}}{1 + \sin \frac{2\pi}{27} + i \cos \frac{2\pi}{27}}$ is equal to
- A) $\cos \frac{2\pi}{27}$
 - B) $\sin \frac{2\pi}{27}$
 - C) $1 + \sin \frac{2\pi}{27}$
 - D) $1 + \cos \frac{2\pi}{27}$
 - E) $\sin \frac{2\pi}{27} + \cos \frac{2\pi}{27}$

Correct Answer : Option B

9. The 25th term of $9, 3, 1, \frac{1}{3}, \frac{1}{9}, \dots$ is

- A) $\frac{1}{3^{24}}$
- B) $\frac{1}{3^{25}}$
- C) $\frac{1}{3^{23}}$
- D) $\frac{1}{3^{22}}$
- E) $\frac{1}{3^{26}}$

Correct Answer : Option D

10. The first three terms in a G.P. are a, b and c where $a \neq b$. Then the fifth term is

- A) $\frac{c^2}{2a}$
- B) $\frac{c}{2a}$
- C) $\frac{c^2}{a}$
- D) $\frac{c^2}{3a}$
- E) $\frac{c}{3a}$

Correct Answer : Option C

11. The sum of first n terms of a G.P. is 1023. If the first term is 1 and the common ratio is 2, then the value of n is

- A) 12
- B) 11
- C) 10
- D) 9
- E) 8

Correct Answer : Option C

12. Let G_1, G_2, G_3 be geometric means between l and n , where l and n are positive real numbers. Then the common ratio is

- A) $\frac{n}{l}$
- B) $\left(\frac{n}{l}\right)^{1/2}$
- C) $\left(\frac{n}{l}\right)^{1/3}$
- D) $\left(\frac{n}{l}\right)^{1/4}$

E) $\frac{n^2}{l^2}$

Correct Answer : Option D

13. 25 distinct objects are divided into 5 groups and each group consists of exactly 5 objects. Then the number of ways of forming such groups, is

A) $\frac{25!}{(5!)^5}$

B) $\frac{25!}{5!}$

C) $\frac{25!}{(5!)^6}$

D) $\frac{25!}{(5!)^4}$

E) $\frac{25!}{(5!)^3}$

Correct Answer : Option C

14. $1 + {}^{100}C_1 + {}^{100}C_2 + \dots + {}^{100}C_{99} + 1 =$

A) 2^{99}

B) 2^{101}

C) 2^{98}

D) 2^{100}

E) 100^2

Correct Answer : Option D

15. The coefficient of x^{10} in $(1 - x^2)(1 - x^3)^9$ is

A) 9C_4

B) $-{}^9C_6$

C) $-{}^9C_4$

D) 9C_6

E) 0

Correct Answer : Option E

16. ${}^{21}C_1 + {}^{21}C_2 + \dots + {}^{21}C_{10} =$

A) 2^{20}

B) 2^{21}

C) $2^{21} - 1$

D) $2^{21} - 2$

E) $2^{20} - 1$

Correct Answer : Option E

17. The constant term in $\left(\frac{\sqrt{x}}{2} + \frac{1}{3x^2}\right)^{10}$ is

A) $\frac{5}{128}$

B) $\frac{9}{128}$

C) $\frac{5}{256}$

D) $\frac{9}{256}$

E) 0

Correct Answer : Option C

18. Let B be a matrix of order 3×2 and C be a matrix of order 3×3 . If A is a matrix such that $BA = C$, then the order of A is

A) 2×2

B) 2×3

C) 3×2

D) 3×4

E) 3×3

Correct Answer : Option B

19. Let $P = \begin{pmatrix} 1 & 1 & 1 \\ 0 & 2 & 2 \\ 0 & 0 & 3 \end{pmatrix}$ and $Q = \begin{pmatrix} 2 & 1 & 2/3 \\ 0 & 4 & 4/3 \\ 0 & 0 & 6 \end{pmatrix}$. Then the $\det(QPQ^{-1})$ is equal to

A) 12

B) 8

C) 48

D) 24

E) 6

Correct Answer : Option E

20. Let $A = \begin{pmatrix} 1 & 3 & 5 \\ -6 & 8 & 3 \\ -4 & 6 & 5 \end{pmatrix}$ and $P = \frac{1}{2}(A + A^T)$. Then

A) $P^T = P$

B) $P^T = -P$

C) $P^T = 2P$

D) $P^T = -2P$

E) $P^T = 3P$

Correct Answer : Option A

21. $\sec^2 x + \operatorname{cosec}^2 x - \sec^2 x \operatorname{cosec}^2 x =$

- A) $\sec^2 x$
- B) $\operatorname{cosec}^2 x$
- C) $\cot^2 x$
- D) 1
- E) 0

Correct Answer : Option E

22. Let x be a real number such that $7x + 4 < 9x + 8$. Then the solution set of the inequality is

- A) $(-\infty, -2)$
- B) $(-\infty, -4)$
- C) $(-2, \infty)$
- D) $[-2, \infty)$
- E) $[-1, \infty)$

Correct Answer : Option C

23. Let x be a real number such that $\frac{3(x+3)}{7} \leq \frac{6(x-1)}{5}$. Then the solution set of the inequality is

- A) $(-\infty, \frac{29}{9})$
- B) $(\frac{29}{9}, \infty)$
- C) $[\frac{29}{9}, \infty)$
- D) $(-\infty, \infty)$
- E) $(\frac{17}{9}, \infty)$

Correct Answer : Option C

24. $\sin 15^\circ \sin 45^\circ \sin 75^\circ =$

- A) $\frac{1}{2\sqrt{2}}$
- B) $\frac{1}{4\sqrt{2}}$

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

Correct Answer : Option B

25. If $\sin \theta = \frac{1}{5}$ and the angle θ is in the second quadrant, then $\sec \theta$ is equal to

- A) $\frac{5}{2\sqrt{6}}$
- B) $\frac{-2\sqrt{6}}{5}$
- C) $\frac{2\sqrt{6}}{5}$
- D) $\frac{\sqrt{6}}{5}$
- E) $\frac{-5}{2\sqrt{6}}$

Correct Answer : Option E

26. $2^2 \sin\left(\frac{x}{2^2}\right) \cos\left(\frac{x}{2}\right) \cos\left(\frac{x}{2^2}\right) =$

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

Correct Answer : Option B

27. $\frac{\cos 75^\circ - \cos 15^\circ}{\cos 75^\circ + \cos 15^\circ}$

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

Correct Answer : Option A

28. $\frac{(2\sin \alpha)(1 + \sin \alpha)}{(1 + \sin \alpha + \cos \alpha)(1 + \sin \alpha - \cos \alpha)}$
- A) $\tan \alpha$
 - B) $\frac{\sin \alpha + 1}{\sin \alpha - 1}$
 - C) 1
 - D) 2
 - E) $\frac{\cos \alpha + 1}{\cos \alpha - 1}$

Correct Answer : Option C

29. If $\sin^{-1}\left(\frac{x}{1+x}\right) = \frac{\pi}{2} - \cos^{-1}\left(\frac{1}{2}\right)$, then x is equal to
- A) $\frac{1}{2}$
 - B) 2
 - C) 3
 - D) 1
 - E) $\frac{1}{4}$

Correct Answer : Option D

30. If $\tan^{-1}x = \tan^{-1}(3) - \frac{\pi}{4}$, then x is equal to
- A) $\frac{1}{2}$
 - B) $\frac{1}{4}$
 - C) 1
 - D) 3
 - E) 2

Correct Answer : Option A

31. If the distance of the line $4x - 3y + k = 0$ from the point $(1, 2)$ is 5 units, then the values of k are
- A) 27, -23
 - B) -27, 23
 - C) 29, -24
 - D) -29, 24
 - E) -28, -25

Correct Answer : Option A

32. Two sides of a parallelogram are along the lines $x + y = 5$ and $x - y = -5$. If the diagonals of the parallelogram intersect at $(3, 6)$ then one of its vertices, is at
- A) $(6,5)$
 - B) $(7,6)$
 - C) $(7,5)$
 - D) $(6,7)$
 - E) $(5,7)$

Correct Answer : Option D

33. Let $ax + by + c = 0$ the equation of a straight line such that $3a + 2b + 4c = 0$. Which one of the following points, lies on the line?
- A) $\left(\frac{3}{4}, \frac{1}{2}\right)$
 - B) $\left(\frac{1}{2}, \frac{3}{4}\right)$
 - C) $\left(\frac{1}{4}, \frac{3}{2}\right)$
 - D) $\left(\frac{3}{2}, \frac{1}{2}\right)$
 - E) $(2,4)$

Correct Answer : Option A

34. If two diameters of a circle are along the lines $2x - 3y = 5$ and $3x - 4y = 7$, then the centre is at
- A) $(1,1)$
 - B) $(-1,1)$
 - C) $(-1,-1)$
 - D) $(1,-1)$
 - E) $(1,-2)$

Correct Answer : Option D

35. Let $y^2 = 8x$ be the equation of a parabola. Which one of the following is an arbitrary point on the parabola?
- A) $(2t, 4t^2), t \in \mathbb{R}$
 - B) $(2t^2, 4t^2), t \in \mathbb{R}$
 - C) $(2t^2, 2t^2), t \in \mathbb{R}$
 - D) $(2t, 2t^2), t \in \mathbb{R}$
 - E) $(2t^2, 4t), t \in \mathbb{R}$

Correct Answer : Option E

36. Let P be any point on the ellipse $4(x + 2)^2 + 9(y - 4)^2 = 144$. If F_1 and F_2 are the Foci of the ellipse, then $F_1P + F_2P =$

- A) 8
- B) 12
- C) 16
- D) 6
- E) 10

Correct Answer : Option B

37. The eccentricity of the hyperbola $\frac{(x-1)^2}{25} - \frac{(y+2)^2}{11} = 1$ is

- A) $\frac{5}{3}$
- B) $\frac{25}{11}$
- C) $\frac{6}{5}$
- D) $\frac{7}{5}$
- E) $\frac{5}{11}$

Correct Answer : Option C

38. Let $\vec{a}, \vec{b}, \vec{c}$ be any three vectors and m, n be scalars. Which one of the following is not true?

- A) $(\vec{a} + \vec{b}) + \vec{c} = \vec{a} + (\vec{b} + \vec{c})$
- B) $m(\vec{a} + \vec{b} + \vec{c}) = m\vec{a} + m\vec{b} + m\vec{c}$
- C) $(m + n)\vec{a} = m\vec{a} + n\vec{a}$
- D) $m(\vec{a} \cdot \vec{b}) = m\vec{a} \cdot m\vec{b}$
- E) $m(\vec{a} \times \vec{b}) = m\vec{a} \times \vec{b}$

Correct Answer : Option D

39. If $\vec{a} \cdot \vec{b} = 12$, then $(3\vec{a}) \cdot (3\vec{b})$ is equal to

- A) 36
- B) 4
- C) 108
- D) 16
- E) 144

Correct Answer : Option C

40. Let $\vec{a} = 3\hat{i} + 2\hat{j} + 2\hat{k}$, $\vec{b} = \hat{i} + 2\hat{j} - 2\hat{k}$. Then $(\vec{a} + \vec{b}) \cdot (\vec{a} - \vec{b}) =$

- A) 6

- B) 7
- C) 8
- D) 9
- E) 10

Correct Answer : Option C

41. $\vec{a}, \vec{b}, \vec{c}, \vec{d}$ be non-zero vectors such that $\vec{a} \times \vec{b} = \vec{c} \times \vec{d}$ and $\vec{a} \times \vec{c} = \vec{b} \times \vec{d}$. Then
- A) $\vec{a} - \vec{d}$ is parallel to $\vec{b} - \vec{c}$
 - B) $\vec{a} - \vec{b}$ is parallel to $\vec{b} - \vec{c}$
 - C) $\vec{b} - \vec{c}$ is parallel to $\vec{b} + \vec{c}$
 - D) $\vec{a} - \vec{c}$ is parallel to $\vec{b} - \vec{c}$
 - E) $\vec{a} + \vec{c}$ is parallel to $\vec{b} + \vec{d}$

Correct Answer : Option A

42. Let $\vec{OP} = 2\hat{j}$ be the position vector a point P. Let $\vec{r} = \hat{j} + \lambda(\hat{i} + \hat{j})$ be a straight line. The distance of the point P from the line is
- A) $\frac{\sqrt{2}}{2}$
 - B) $\frac{\sqrt{3}}{3}$
 - C) $\frac{\sqrt{6}}{3}$
 - D) $\frac{\sqrt{2}}{3}$
 - E) $\frac{\sqrt{2}}{4}$

Correct Answer : Option A

43. The Cartesian equation of the line $\vec{r} = (2\hat{i} - 7\hat{j} + 11\hat{k}) + \lambda(3\hat{i} + 7\hat{j} - 13\hat{k})$ is
- A) $\frac{x-2}{3} = \frac{y+7}{7} = \frac{z-11}{-13}$
 - B) $\frac{x-2}{3} = \frac{y-7}{7} = \frac{z-11}{13}$
 - C) $\frac{x+2}{3} = \frac{y-7}{7} = \frac{z+11}{-13}$
 - D) $\frac{x+2}{3} = \frac{y+7}{7} = \frac{z-11}{-13}$
 - E) $\frac{x+2}{3} = \frac{y}{13} = \frac{z-11}{-7}$

Correct Answer : Option A

44. Which one of the following is a point on the straight line $\vec{r} = (13\hat{i} - 14\hat{j} + 23\hat{k}) + \lambda (5\hat{i} - 7\hat{j} - 9\hat{k}), \lambda \in \mathbb{R}$

- A) (13,-14,-23)
- B) (5,-7,-9)
- C) (23,-28,7)
- D) (23,-28,5)
- E) (13,14,23)

Correct Answer : Option D

45. The point at which the line $\frac{x+3}{11} = \frac{y-2}{-1} = \frac{z+1}{3}$ meets the zx -plane is

- A) (19,2,5)
- B) (19,0,5)
- C) (0,2,-1)
- D) (-3,2,0)
- E) (0,2,-1)

Correct Answer : Option B

46. The mean deviation about the mean from the data 400,410, 420,430,440 is

- A) 14
- B) 10
- C) 20
- D) 12
- E) 16

Correct Answer : Option D

47. An unbiased die is thrown and B is an event showing an odd number on top. Then $P(B)$

- A) $\frac{1}{4}$
- B) $\frac{1}{3}$
- C) $\frac{1}{6}$
- D) $\frac{1}{2}$
- E) $\frac{1}{5}$

Correct Answer : Option D

48. The standard deviation of 1,2,3,...,100 is

- A) $\frac{1}{2}\sqrt{3333}$
- B) $\frac{1}{4}\sqrt{3333}$

- C) $\frac{1}{6}\sqrt{3333}$
- D) $\frac{1}{8}\sqrt{3333}$
- E) $\frac{1}{4}\sqrt{1111}$

Correct Answer : Option A

49. Consider the random experiment that an integer is chosen from the first 100 positive integers. Probability that the chosen number is a multiple of 11, is

- A) $\frac{1}{10}$
- B) $\frac{1}{11}$
- C) $\frac{9}{100}$
- D) $\frac{13}{100}$
- E) $\frac{11}{100}$

Correct Answer : Option C

50. $\lim_{x \rightarrow 0} \frac{\sin x}{2\sqrt{2} \sin \frac{x}{\sqrt{2}}} =$

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

Correct Answer : Option E

51. $\lim_{\theta \rightarrow 0} \frac{\theta \sin 2\theta}{1 - \cos 2\theta}$

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

Correct Answer : Option A

52. The function $f(x) = x(\sqrt{x+2} + \sqrt{x+1})$ is continuous on

- A) $(-\infty, 1]$
- B) $[4, \infty)$
- C) $[-3, \infty)$
- D) $[-1, \infty)$
- E) $(-\infty, \infty)$

Correct Answer : Option D

53. $\lim_{x \rightarrow 2} \frac{\sin x \cos 2 - \cos x \sin 2}{x-2} =$

- A) -1
- B) 1
- C) 4
- D) 2
- E) 0

Correct Answer : Option B

54. Let $f(x) = [x], x \in (0, 6)$, where $[x]$ is the greatest integer function. Then the number of discontinuities of $f(x)$

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

Correct Answer : Option E

55. Let $f(x) = 10 - |x - 5|, x \in \mathbb{R}$, Then $f(x)$ is not differentiable at

- A) $x=10$
- B) $x=15$
- C) $x=-5$
- D) $x=5$
- E) $x=-15$

Correct Answer : Option D

56. For $x \in \mathbb{R}$, let $f(x) = \log 3 - \sin x$ and $g(x) = f(f(x))$ Then $g'(0) =$

- A) $\sin(\log 3)$
- B) $-\sin(\log 3)$
- C) $-\cos(\log 3)$
- D) $2\cos(\log 3)$

E) $\cos(\log 3)$

Correct Answer : Option E

57. If $y = \cos x \cos y$, then $\frac{dy}{dx}$ at $\left(\frac{\pi}{3}, \frac{\pi}{6}\right)$ is

A) $\frac{-3}{5}$

B) $\frac{3}{5}$

C) $\frac{5}{3}$

D) $\frac{-5}{3}$

E) $\frac{-4}{3}$

Correct Answer : Option A

58. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be a function such that $f(x) = x^3 + x^2 f'(1) + x f''(2) + f'''(3)$, then $f'''(3) =$

A) 3

B) 6

C) 9

D) -2

E) $f''(2)$

Correct Answer : Option B

59. If $u = \sec^{-1}(-\sec 2\theta)$ and $v = \cos \theta$, then $\frac{du}{dv}$ at $\theta = \frac{\pi}{4}$, is equal to

A) $\sqrt{2}$

B) $2\sqrt{2}$

C) $\frac{1}{\sqrt{2}}$

D) $\frac{1}{2\sqrt{2}}$

E) $-\sqrt{2}$

Correct Answer : Option B

60. The function $f(x) = e^x - x$ is increasing in the interval

A) $(0, 4)$

B) $(-\infty, 0)$

C) $(-1, 1)$

D) $(-1, 0)$

E) $(0, \infty)$

Correct Answer : Option E

- 61.** Let $f(x) = 10 - |x - 3|$, $x \in \mathbb{R}$ The maximum of $f(x)$ occurs at
- A) $x=0$
 - B) $x=3$
 - C) $x=-3$
 - D) $x=10$
 - E) $x=1$

Correct Answer : Option B

- 62.** The distance travelled by a moving particle is given by $s = \frac{t^2}{2} - 6t + 8$, where t denotes the time in seconds. The velocity becomes zero when t is equal to
- A) 1
 - B) 4
 - C) 3
 - D) 6
 - E) 8

Correct Answer : Option D

- 63.** If $a + b = 10$ and ab is maximum, then the value of a is
- A) 5
 - B) 3
 - C) 6
 - D) 25
 - E) 10

Correct Answer : Option A

- 64.** If $\int \frac{1}{x^7 \left(\frac{1}{x^6} + 1\right)^{2/3}} dx = -\frac{1}{2} \left(\frac{1}{\frac{1}{x^6} + 1}\right)^p + c$, then $p =$

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

D) $\frac{-2}{3}$

E) $\frac{1}{6}$

Correct Answer : Option B

65. $\int \frac{\sec x}{(\sec x + \tan x)^9} dx =$

A) $\frac{1}{9}(\sec x + \tan x)^9 + C$

B) $\frac{-1}{9}(\sec x + \tan x)^9 + C$

C) $\frac{-1}{9}(\sec x + \tan x)^{-9} + C$

D) $\frac{1}{9}(\sec x + \tan x)^{-9} + C$

E) $(\sec x + \tan x)^{-9} + C$

Correct Answer : Option C

66. $\int \frac{(9e^x + 4e^{-x})}{(9e^x - 4e^{-x})} dx =$

A) $9e^x - 4e^{-x} + C$

B) $\log|9e^x + 4e^{-x}| + C$

C) $4e^x - 9e^{-x} + C$

D) $\log|4e^x - 9e^{-x}| + C$

E) $\log|9e^x - 4e^{-x}| + C$

Correct Answer : Option E

67. $\int e^{2\theta} (2 \cos^2 \theta - \sin 2\theta) d\theta =$

A) $e^{2\theta} \cos^2 \theta + C$

B) $e^{2\theta} \sin 2\theta + C$

C) $2e^{2\theta} \cos^2 \theta + C$

D) $e^{2\theta} \sin \theta + C$

E) $e^{2\theta} \cos 2\theta + C$

Correct Answer : Option A

68. $\int e^{\left(\frac{x+1}{x}\right)} \left(\frac{x^2-1}{x^2}\right) dx =$

- A) $x e^{\left(\frac{x+1}{x}\right)} + C$
- B) $e^{\left(\frac{x+1}{x}\right)} + C$
- C) $x + e^{\left(\frac{x+1}{x}\right)} + C$
- D) $x^2 e^{\left(\frac{x+1}{x}\right)} + C$
- E) $e^{\left(\frac{x+1}{x}\right)} + x^2 + C$

Correct Answer : Option B

69. The area bounded by $y = x - 1, 1 \leq x \leq 2, y = 0$ (in sq.units) is

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

Correct Answer : Option C

70. Given that $\int_0^1 \tan^{-1}(t) dt = \frac{\pi}{4} - \frac{1}{2} \log 2$. Then $\int_0^1 \tan^{-1}(1-t) dt =$

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

Correct Answer : Option E

71. $\int_0^{\frac{\pi}{2}} \frac{1}{1 + \sin x} dx =$

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

E) 0

Correct Answer : Option D

72. $\int_{-2}^2 |x+3| dx =$

- A) 14
- B) 16
- C) 8
- D) 10
- E) 12

Correct Answer : Option E

73. If $\frac{dy}{dx} = \frac{1}{8(\sqrt{16+\sqrt{25+\sqrt{x}}})(\sqrt{25+\sqrt{x}})\sqrt{x}}$, then $y =$

- A) $\sqrt{16 + \sqrt{25 + \sqrt{x}}} + C$
- B) $\sqrt{16 + \sqrt{25 + \sqrt{x}}} + x + C$
- C) $\sqrt{16 + \sqrt{25 + \sqrt{x}}} + x^2 + C$
- D) $x \sqrt{16 + \sqrt{25 + \sqrt{x}}} + C$
- E) $x^2 \sqrt{16 + \sqrt{25 + \sqrt{x}}} + C$

Correct Answer : Option A

74. The elimination of arbitrary constants c_1, c_2, c_3 and c_4 from $y = (c_1 + c_2) \sin(x + c_3) - c_4 e^x$ gives a differential equation of order

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

Correct Answer : Option C

75. The maximum value of the objective function $z = 2x + 3y$, when the corner points of the feasible region are $(0, 0), (5, 0), (4, 1)$ and $(0, 2)$, is

- A) 0
- B) 6
- C) 10

- D) 11
- E) 16

Correct Answer : Option D

76. The dimension of X in the equation, $F = 6\pi \eta X$ is
(F – Force; η -Coefficient of viscosity)

- A) $M^0L^2T^{-1}$
- B) ML^2T^{-2}
- C) $M^0L^2T^{-2}$
- D) $M^0L^3T^{-2}$
- E) ML^2T^{-1}

Correct Answer : Option A

77. One torr is

- A) 1 mm of Hg
- B) 1 cm of Hg
- C) 76 mm of Hg
- D) 100 mm of Hg
- E) 76 cm of Hg

Correct Answer : Option A

78. A particle moving with an initial velocity of 1 ms^{-1} has an uniform acceleration of 2 m s^{-2} . The distances travelled by the particle in the first two intervals of 5 s are respectively

- A) 30 m and 110 m
- B) 50 m and 110 m
- C) 40 m and 80 m
- D) 30 m and 80 m
- E) 60 m and 160 m

Correct Answer : Option D

79. When a cricketer hits a ball at an angle of 45° with an initial velocity of 40 ms^{-1} , the ball falls on the ground at a distance of 160 m. If he hits the ball at the same angle with an initial velocity of 50 ms^{-1} the ball will fall at a distance of

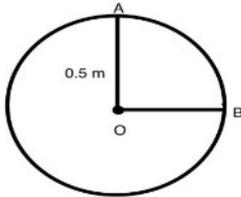
- A) 480 m
- B) 180 m
- C) 280 m
- D) 300 m

E) 250 m

Correct Answer : Option E

A ball moves in a circle of radius 0.5 m from A to B in $\sqrt{2}$ s. The average velocity of the ball is (in mS^{-1})

80.



- A) 0.25
- B) 0.5
- C) 0.75
- D) 1.5
- E) 1.25

Correct Answer : Option B

81. A block of mass m suspended from the ceiling of a lift by an inextensible string of negligible mass. When the lift moves in the upward direction with an acceleration of 0.2 ms^{-2} , the tension acting on the wire is 80 N. Then the mass of the block is

- A) 1 kg
- B) 2 kg
- C) 8 kg
- D) 6 kg
- E) 4 kg

Correct Answer : Option C

82. The force to be applied to a body of mass 200 g to change its velocity by 25 ms^{-1} in 5 s is

- A) 2.5 N
- B) 50 N
- C) 3 N
- D) 30 N
- E) 1 N

Correct Answer : Option E

83. Two bodies having masses in the ratio 1:3 have equal linear momentum. Their respective kinetic energies are in the ratio

- A) 3:1
- B) 1:2
- C) 1:3

- D) 4:1
- E) 2:1

Correct Answer : Option A

- 84.** A particle moving in a horizontal circle of radius 0.5 m completes half rotation. The work done by the centripetal force of 5 N on the particle (in J) is
- A) 2
 - B) 5
 - C) 2.5
 - D) 3
 - E) 1

Correct Answer:-Question Cancelled

- 85.** The moment of inertia and rotational kinetic energy of a rigid body about an axis are respectively 4 kgm^2 and 50 J . The angular velocity of the body (in rad s^{-1}) is
- A) 10
 - B) 20
 - C) 25
 - D) 5
 - E) 15

Correct Answer : Option D

- 86.** If a torque of 1.25 Nm acts on a circular ring for a duration of 4 s , then its angular momentum changes by ($\text{kgm}^2\text{ s}^{-1}$)
- A) 25
 - B) 50
 - C) 15
 - D) 5
 - E) 10

Correct Answer : Option D

- 87.** If the angular displacement made by a rotating wheel in 10 s is 150π radian, then the number of revolutions made by it is
- A) 75
 - B) 100
 - C) 300
 - D) 150
 - E) 50

Correct Answer : Option A

- 88.** Two satellites A and B are orbiting the earth at a height of $2.5R$ and $7.5R$ respectively from the centre of the earth. The ratio of time periods of A and B is
- A) $\sqrt{3}:1$

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

Correct Answer : Option B

89. The orbital velocity v_o of an artificial satellite revolving around the earth at a height R from the surface of the earth in terms of escape velocity v_e from the earth is (R - radius of the earth)

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

Correct Answer : Option A

90. P_a is the atmospheric pressure and P is the absolute pressure at a depth h in an ocean. The gauge pressure at the depth h is

- A) $P + P_a$
- B) $\frac{P - P_a}{2}$
- C) $2P - P_a$
- D) $\frac{P + P_a}{2}$
- E) $P - P_a$

Correct Answer : Option E

91. The principle behind the function of Bunsen burner is

- A) Pascal's law
- B) law of flotation
- C) venturimeter
- D) Toricelli's law
- E) Archimedes' principle

Correct Answer : Option C

92. Bernoulli's principle is applicable to

- A) non-viscous, incompressible fluids in streamline flow
- B) viscous, compressible fluids in streamline flow

- C) viscous, incompressible fluids in streamline flow
- D) non-viscous, incompressible fluids in turbulent flow
- E) non-viscous, compressible fluids in turbulent flow

Correct Answer : Option A

93. Specific heat capacity of a substance depends on the

- A) material of the substance only
- B) volume of the substance only
- C) mass of the substance only
- D) material and temperature of the substance
- E) mass and volume of the substance

Correct Answer : Option D

94. Which one is INCORRECT statement?

- A) In an isochoric process, volume remains constant
- B) In an adiabatic process, there is a heat exchange with the surrounding
- C) In an isobaric process, pressure remains constant
- D) In an isothermal process, temperature remains constant
- E) In a cyclic process, the change in internal energy is zero

Correct Answer : Option B

95. The number of molecules contained in the gas of mass M is (M_o - molar mass, N_A - Avogadro's number)

- A) $\left(\frac{M}{M_o}\right) \frac{1}{N_A}$
- B) $\left(\frac{M_o}{M}\right) N_A$
- C) $(MM_o) N_A$
- D) $(MM_o) \frac{1}{N_A}$
- E) $\left(\frac{M}{M_o}\right) N_A$

Correct Answer : Option E

96. If the mean free path of a gas molecule at 27 °C is $10 \times 10^{-7} m$. Its mean free path at 87 °C is

- A) $12 \times 10^{-7} m$
- B) $8 \times 10^{-7} m$
- C) $6 \times 10^{-7} m$
- D) $10 \times 10^{-7} m$
- E) $14 \times 10^{-7} m$

Correct Answer : Option A

97. If the speed of the transverse wave in a wire under certain tension T is v , then its speed under tension $2T$ (in ms^{-1}) is

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

Correct Answer : Option C

98. A musician hits a drum 90 times in a minute. The time period of hit is

- A) 1.34 s
- B) 1.5 s
- C) 0.33 s
- D) 0.75 s
- E) 0.67 s

Correct Answer : Option E

99. If the time period of a particle executing SHM is 8 s, then the time period of the potential energy of this particle is

- A) 16 s
- B) 4 s
- C) 2 s
- D) 8 s
- E) 32 s

Correct Answer : Option B

100. Which one of the following pairs of charges separated by the same distance r will experience a maximum force?

- A) 0.3 C and 0.7 C
- B) 0.1 C and 0.9 C
- C) 0.2 C and 0.8 C
- D) 0.5 C and 0.5 C
- E) 0.4 C and 0.6 C

Correct Answer : Option D

101. A charge of 5 C is moved from a point P to another point Q by doing a work of 10 J. If the potential at P is 0.5 V, then the potential at Q is

- A) 1.0V
- B) 2.0V
- C) 2.5 V
- D) 1.5V
- E) 3.0V

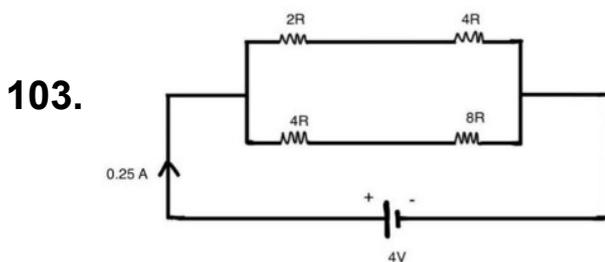
Correct Answer : Option C

102. The equivalent capacitance of n capacitors of equal capacitance when connected in series and parallel are respectively $0.4 \mu\text{F}$ and $10 \mu\text{F}$. The capacitance of each capacitor is

- A) $2 \mu\text{F}$
- B) $4 \mu\text{F}$
- C) $5 \mu\text{F}$
- D) $6 \mu\text{F}$
- E) $1 \mu\text{F}$

Correct Answer : Option A

The value of R in the given circuit is



- A) 0.4Ω
- B) 8Ω
- C) 2Ω
- D) 0.8Ω
- E) 4Ω

Correct Answer : Option E

104. The resistance of a wire at 30°C and 40°C are respectively 5Ω and 6Ω . The temperature coefficient of resistance of the material of the wire (in per degree Celcius) is

- A) 0.04
- B) 0.05
- C) 0.02
- D) 0.03
- E) 0.01

Correct Answer : Option B

105. A wire of 25Ω resistance is cut into n pieces of equal length. If these pieces of wires are connected in parallel, their equivalent resistance is 1Ω , then the value of n is

- A) 3
- B) 6
- C) 8
- D) 5
- E) 4

Correct Answer : Option D

106. A coil having 100 turns and an area of 0.02 m^2 is placed with its plane perpendicular to the magnetic field of 1 Wbm^{-2} . The magnetic flux linked with the coil is

- A) zero
- B) 1 Wb
- C) 2 Wb
- D) 3 Wb
- E) 5 Wb

Correct Answer : Option C

107. Two charged particles of same mass but having charges in the ratio 1: 4 enter a uniform perpendicular magnetic field. The ratio of their time period in their respective circular path is

- A) 1: 4
- B) 1: 8
- C) 8: 1
- D) 4: 1
- E) 2: 1

Correct Answer : Option D

108. Which one is not a ferromagnetic material?

- A) cobalt
- B) tungsten
- C) nickel
- D) gadolinium
- E) iron

Correct Answer : Option B

109. If an inductor coil of self-inductance 2 H stores 25 J of magnetic energy, then the current I passing through it is

- A) 25 A
- B) 10A
- C) 15A
- D) 2 A
- E) 5 A

Correct Answer : Option E

- 110.** When a current passing through a coil changes at the rate of 30 A s^{-1} , the emf induced in the coil is 12 V. The self-inductance of the coil is
- A) 0.4 H
 - B) 0.2 H
 - C) 0.6 H
 - D) 0.3 H
 - E) 0.1 H

Correct Answer : Option A

- 111.** An electromagnetic wave travelling in vacuum has its electric field component, $E = 15 \sin [1.57y + 5.4t]$. The wavelength of the wave is
- A) 4.0 m
 - B) 3.0 m
 - C) 2.5 m
 - D) 2.0 m
 - E) 1.0 m

Correct Answer : Option A

- 112.** Chromatic aberration arises in thick lenses due to
- A) scattering of light
 - B) refraction of light
 - C) interference of light
 - D) reflection of light
 - E) dispersion of light

Correct Answer : Option E

- 113.** An unpolarized light incident on a plane glass surface gets totally polarized on reflection. If the refractive index of glass is $\tan 57^\circ$, then the angle of refraction is
- A) 90°
 - B) 33°
 - C) 13°
 - D) 37°
 - E) 45°

Correct Answer : Option B

- 114.** Light energy is redistributed in
- A) diffraction and interference
 - B) reflection and diffraction
 - C) refraction and interference

- D) reflection and polarisation
- E) polarization and refraction

Correct Answer : Option A

Which one of the following statements is INCORRECT?

115.

In photoelectric effect

- A) Threshold frequency is different for different metals
- B) The same metal gives same response to light of different wavelengths
- C) The emission of photoelectrons is an instantaneous process
- D) Above the threshold frequency the number of photoelectrons emitted per sec is directly proportional to the intensity of incident radiation
- E) The maximum K.E. of the photoelectrons is independent of the intensity of incident radiation

Correct Answer : Option B

116. When an electron is accelerated from rest by a potential of 480 V, the wavelength associated with it is λ . If the electron at rest is accelerated by a potential of 120 V, then the wavelength associated with it is

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

Correct Answer : Option C

117. In hydrogen spectrum, the shortest wavelength of Bracket series is produced during the transition between the states

- A) $n_2 = 5$ and $n_1 = 4$
- B) $n_2 = 4$ and $n_1 = 1$
- C) $n_2 = 4$ and $n_1 = 3$
- D) $n_2 = \infty$ and $n_1 = 4$
- E) $n_2 = 4$ and $n_1 = 2$

Correct Answer : Option D

118. A radioactive element having 6×10^5 atoms initially decays and is left with 0.75×10^5 undecayed atoms in 48 years. The half-life time of this radioactive element is

- A) 16 years
- B) 24 years
- C) 12 years
- D) 6 years
- E) 18 years

Correct Answer : Option A

119. The possible number of energy states in a Ge crystal containing 5×10^3 atoms is

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

Correct Answer : Option B

120. A *pn* junction diode without any voltage biasing acts as a

- A) rectifier
- B) resistor
- C) ac generator
- D) voltage regulator
- E) transformer

Correct Answer : Option B

121. How many moles of methane are required to produce 11 g $\text{CO}_2(g)$ after combustion?
(Molar mass of $\text{CO}_2 = 44 \text{ g mol}^{-1}$)

- A) 0.25
- B) 0.5
- C) 1.5
- D) 2.0
- E) 2.5

Correct Answer : Option A

122. A sub-atomic particle of mass $6.63 \times 10^{-31} \text{ kg}$ is moving with a velocity of $1 \times 10^6 \text{ ms}^{-1}$. What is the de Broglie wave length (in *nm*) associated with it ($h = 6.63 \times 10^{-34} \text{ Js}$)?

- A) 10.0
- B) 1.0
- C) 0.10
- D) 5.0
- E) 0.50

Correct Answer : Option B

123. For hydrogen atom, the orbitals with the lowest energy among the given orbitals are
(i) 4s (ii) $2p_x$ (iii) $3d_{z^2}$ (iv) $2p_y$

- A) (i) & (iii)
- B) (ii) & (iv)

- C) (ii) & (iii)
- D) (ii) only
- E) (i) only

Correct Answer : Option B

Which of the following species will have the largest and the smallest sizes respectively?

124.

Na, Mg, Na⁺, Mg²⁺

- A) Mg and Na⁺
- B) Mg and Mg²⁺
- C) Na and Mg²⁺
- D) Na and Mg
- E) Na⁺ and Mg

Correct Answer : Option C

125. Which of the following statement is INCORRECT?

- A) The dipole moment of BF₃ is zero.
- B) The bond order of CO molecule is the same as the bond order in NO⁺ ion.
- C) In ozone molecule, the two O-O bond lengths are equal.
- D) The dipole moment of NF₃ is much greater than that in NH₃
- E) Carbonate ion has three canonical forms.

Correct Answer : Option D

In which of following reactions entropy decreases?

- 126.**
- (i) $2\text{Pb}(\text{NO}_3)_2(\text{s}) \rightarrow 2\text{PbO}(\text{s}) + 4\text{NO}_2(\text{g}) + \text{O}_2(\text{g})$
 - (ii) $\text{H}_2\text{O}(\text{g}) \rightarrow \text{H}_2\text{O}(\text{l})$
 - (iii) $\text{Br}_2(\text{l}) \rightarrow 2\text{Br}(\text{g})$
 - (iv) $\text{C}_6\text{H}_6(\text{l}) \rightarrow \text{C}_6\text{H}_6(\text{s})$

- A) (ii), (iii) and (iv)
- B) (i) and (iii)
- C) (i) and (iii)
- D) (i) and (iv)
- E) (ii) and (iv)

Correct Answer : Option E

The enthalpy of combustion values of C₂H₄(g), C(graphite,s) and H₂(g) are

127. respectively -1411kJ mol⁻¹, -394 kJ mol⁻¹ and -286 kJ mol⁻¹. What is the value of enthalpy of formation of C₂H₄(g) in kJ mol⁻¹ ?

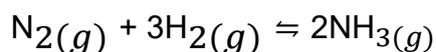
- A) -102

- B) -51
- C) +102
- D) +153
- E) +51

Correct Answer : Option E

The following concentrations were obtained in the formation of $\text{NH}_3(g)$ from $\text{N}_2(g)$ and $\text{H}_2(g)$ at equilibrium at 500 K:

- 128.** $[\text{NH}_3] = 1.5 \times 10^{-2} \text{ M}$, $[\text{N}_2] = 5 \times 10^{-3} \text{ M}$ and $[\text{H}_2] = 0.10 \text{ M}$
Calculate the equilibrium constant for the reaction (in $\text{dm}^6 \text{ mol}^{-3}$) at 500 K.



- A) 0.45
- B) 4.5
- C) 45.0
- D) 4.5×10^{-2}
- E) 4.5×10^{-3}

Correct Answer : Option C

- 129.** Which of the following is a Lewis acid?

- A) HCl
- B) HO^-
- C) H_2O
- D) Co^{3+}
- E) NH_3

Correct Answer : Option D

The EMF of the following cell at 298K is

- 130.** $\text{Mg}(s) | \text{Mg}^{2+}(\text{aq}) (0.10\text{M}) || \text{Ag}^+(\text{aq})(0.001\text{M}) | \text{Ag}(s)$
(Given: $E_{\text{cell}}^0 = 3.17\text{V}$ and $2.303RT/F = 0.06 \text{ V}$)

- A) 3.32V
- B) 2.96V
- C) 3.02V
- D) 3.17V
- E) 3.47V

Correct Answer : Option C

- 131.** The electrolyte used in lead storage battery is

- A) 10% H_2SO_4 aqueous solution

- B) 60% H₂SO₄ aqueous solution
- C) 38% H₂SO₄ aqueous solution
- D) 38% HCl aqueous solution
- E) 60% HCl aqueous solution

Correct Answer : Option C

132. The binary liquid mixture that has positive deviation from Raoult's law is

- A) Chloroform-Acetone
- B) Chloroethane-Bromoethane
- C) Phenol-Aniline
- D) Benzene-Toluene
- E) Ethanol-Acetone

Correct Answer : Option E

133. A first order reaction has a rate constant of $6.93 \times 10^{-4} \text{ s}^{-1}$ at 300 K. What is the half life period of the reaction in seconds at the same temperature?

- A) 693
- B) 6930
- C) 10000
- D) 1000
- E) 500

Correct Answer : Option D

134. Which of the following is true in respect of a zero order reaction?

- A) Plot of [Reactant] against time is a straight line with slope equal to k
- B) Plot of [Reactant] against time is a straight line with slope equal to -k
- C) Plot of [Reactant] against time is a straight line with slope equal to 2.303 k
- D) Plot of [Reactant] against time is a straight line with slope equal to -2.303 k
- E) Plot of [Reactant] against time is a straight line with slope equal to -k/2.303

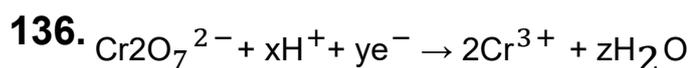
Correct Answer : Option B

135. Which of the following 3d transition metal has +5 state as the more stable state?

- A) Titanium
- B) Vanadium
- C) Manganese
- D) Nickel
- E) Silver

Correct Answer : Option B

In acidic medium, dichromate behaves as an oxidizing agent which can be represented as



The values of x, y and z are respectively

- A) 6, 7 and 14
- B) 7, 6 and 14
- C) 14, 6 and 7
- D) 14, 7 and 6
- E) 6, 12 and 7

Correct Answer : Option C

137. Which of the following is not an interstitial compound?

- A) Sc_2O_3
- B) TiC
- C) Mn_4N
- D) $\text{TiH}_{1.7}$
- E) Fe_3H

Correct Answer : Option A

138. Which of the following transition metal has the highest magnetic moment?

- A) Sc^{3+}
- B) Ti^{3+}
- C) Cr^{2+}
- D) Fe^{2+}
- E) Mn^{2+}

Correct Answer : Option E

139. Which of the following complex is optically active?

- A) $\text{trans} - [\text{CrCl}_2(\text{ox})_2]^{3-}$
- B) $\text{trans} - [\text{PtCl}_2(\text{en})_2]^{2+}$
- C) $\text{cis} - [\text{Pt}(\text{NH}_3)_2]\text{Cl}_2$
- D) $\text{trans} - [\text{Pt}(\text{NH}_3)_2]\text{Cl}_2$
- E) $\text{cis} - [\text{PtCl}_2(\text{en})_2]^{2+}$

Correct Answer : Option E

140. The number of bridging carbonyl groups in $[\text{Mn}_2(\text{CO})_{11}]$ is

- A) 2
- B) 0
- C) 4
- D) 3
- E) 1

Correct Answer : Option B

141. On complete combustion 0.12g of an organic compound gives 0.11g of CO₂. What is the percentage of carbon in the organic compound?

- A) 15%
- B) 20%
- C) 25%
- D) 17.5%
- E) 21.5%

Correct Answer : Option C

142. One mole of an alkene reacts with acidic KMnO₄ to give two moles of ethanoic acid. What is the alkene?

- A) 2-Methylpropene
- B) 1-Butene
- C) 2-Pentene
- D) 2-Butene
- E) 2-Methyl-2-butene

Correct Answer : Option D

143. Which of the following is a vicinal dihalide?

- A) 1,1-Dibromopropane
- B) 1,2-Dibromopropane
- C) 1,3-Dibromopropane
- D) Benzal dibromide
- E) 1,3-Dibromobutane

Correct Answer : Option B

144. S_N1 reaction is most favoured by

- A) Ethyl bromide
- B) 2-methyl-2-bromopropane
- C) 2-bromopropane
- D) 1-bromopropane
- E) 1-bromobutane

Correct Answer : Option B

145. Phenol is treated with $\text{Con. } H_2SO_4$ to give a product 'X' which on treatment with $\text{Con. } HNO_3$ gives compound 'Y'. The compounds 'X' and 'Y' are respectively
- A) Phenol-2-sulphonic acid and 2-nitrophenol
 - B) Phenol-2-sulphonic acid and 4-nitrophenol
 - C) Phenol-2-sulphonic acid, mixture of 2-nitrophenol and 4-nitrophenol
 - D) Phenol-2,4-disulphonic acid, mixture of 2-nitrophenol and 4-nitrophenol
 - E) Phenol-2,4-disulphonic acid and picric acid

Correct Answer : Option E

146. Denatured alcohol with colour and foul smell is made now a days by mixing ethanol with
- A) Methanol
 - B) $ZnSO_4$ and thiophene
 - C) $CuSO_4$ and pyridine
 - D) $FeSO_4$ and furan
 - E) $Fe_2(SO_4)_3$ and hexane

Correct Answer : Option C

147. Benzoyl chloride is converted to benzaldehyde by
- A) Etard reaction
 - B) Stephen reaction
 - C) Gatterman reaction
 - D) Gatterman – Koch reaction
 - E) Rosenmund reaction

Correct Answer : Option E

148. In which of the following liquid inter molecular hydrogen bonding does not exist?
- A) CH_3COOH
 - B) C_2H_5OH
 - C) Phenol
 - D) Diethylether
 - E) Ethylamine

Correct Answer : Option D

149. The IUPAC name of allylamine is
- A) But-2-en-1-amine
 - B) But-1-en-2-amine
 - C) Prop-2-en-1-amine
 - D) Prop-1-en-2-amine
 - E) 2-Amino 1-propene

Correct Answer : Option C

150. The carbohydrate found in yeast is

- A) lactose
- B) starch
- C) cellulose
- D) maltose
- E) glycogen

Correct Answer : Option E