उचित विकल्प चुनिए।
by selecting the **most appropriate** option.

91. The value of $9^{\frac{1}{3}} \times 9^{\frac{1}{9}} \times 9^{\frac{1}{27}} \times \ldots\ldots\infty$ is :

(1) 1

(2) 9

(3) 3

(4) 6

92. If $f(x) = x^{100} + x^{99} + \ldots\ldots + x + 1$, then $f'(1)$ is equal to :

(1) 5000

(2) 5051

(3) 5050

(4) 5049

93. If the angle between the vectors $5\hat{i}+3\hat{j}+4\hat{k}$ and $6\hat{i}-8\hat{j}-\hat{k}$ is θ, then $\cos\theta$ is equal to :

(1) -1

(2) $\frac{8}{75}$

(3) $\frac{\sqrt{2}}{5\sqrt{101}}$

(4) $\frac{1}{\sqrt{2}}$

94. If $\vec{a}=\hat{i}+\hat{j}+2\hat{k}$ and $\vec{b}=3\hat{i}+2\hat{j}-\hat{k}$, then $(\vec{a}+3\vec{b}).(2\vec{a}-\vec{b})=?$

(1) 10

(2) -15

(3) 3

(4) 12

95. Evaluate : $\int_{-1}^{1}\frac{1}{x^2+2x+5}dx=?$

(1) $\frac{\pi}{8}$

(2) 0

(3) -1

(4) $\frac{\pi}{2}$

Space For Rough Work

96. What is the modulus of complex number $\frac{i-1}{\cos\frac{\pi}{3}+i\sin\frac{\pi}{3}}$?

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

(2) $\sqrt{2}$

(3) $\frac{\sqrt{3}}{2}$

(4) $\frac{1}{\sqrt{3}}$

97. If the points $(-1, -1, 2)$, $(2, m, 5)$ and $(3, 11, 6)$ are collinear, then what is the value of m ?

(1) 2

(2) 5

(3) 8

(4) -1

98. The solution set of the inequation $|x+2| \leq 5$ is :

(1) $(-7, 5)$

(2) $[-5, 5]$

(3) $[-7, 3]$

(4) $(-7, 6)$

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99. Function $f(x)=\frac{3}{x}+7$ for $x \in R-\{0\}$ is :

(1) Decreasing

(2) Increasing

(3) Neither increasing nor decreasing

(4) None of the above

100. What is the equation of the hyperbola, whose length of latus rectum is 8 and eccentricity is $3/\sqrt{5}$?

(1) $\frac{x^2}{4}-\frac{y^2}{9}=-1$

(2) $\frac{x^2}{25}-\frac{y^2}{20}=1$

(3) $\frac{x^2}{9}-\frac{y^2}{7}=1$

(4) $\frac{x^2}{\sqrt{3}}-\frac{y^2}{\sqrt{2}}=1$

ace For Rough Work

101. In what ratio, the line joining (–1, 1) and (5, 7) is divided by the line $x + y = 4$?

(1) 1 : 1

(2) 1 : 2

(3) 3 : 2

(4) 4 : 1

102. Evaluate : $\Delta = \begin{vmatrix} 10! & 11! & 12! \\ 11! & 12! & 13! \\ 12! & 13! & 14! \end{vmatrix}$

(1) 0

(2) $10! \times 11! \times 12!$

(3) $2(10! \times 11! \times 12!)$

(4) $10! \times 11!$

103. If 7th and 13th terms of an Arithmetic progression be 34 and 64 respectively, then its 18th term is :

(1) 87 (2) 88

(3) 89 (4) 90

104. What is the coefficient of x^6y^3 in the expansion of $(x+2y)^9$?

(1) 1365

(2) 672

(3) 5040

(4) 185

105. What is the area of the region bounded by the curve $y = x^3$ and the lines $y = x+6$ and $x = 0$?

(1) 20 sq. units

(2) 10 sq. units

(3) $\frac{1}{3}$ sq. units

(4) $\frac{21}{2}$ sq. units

106. If $f(x)=\begin{cases} 1, & \text{if } x \le 3 \\ ax+b, & \text{if } 3 < x < 5 \\ 7, & \text{if } 5 \le x \end{cases}$

determine the values of a and b, so that $f(x)$ is continuous :

(1) $a = 2, b = 8$

(2) $a = 1, b = 1$

(3) $a = 0, b = -2$

(4) $a = 3, b = -8$

107. If the origin is the centroid of the triangle with vertices $P(2a, 2, 6)$, $Q(-4, 3b, -10)$ and $R(8, 14, 2c)$, what will be the values of a, b and c ?

(1) $a = -2, b = \frac{-16}{3}, c = 2$

(2) $a = 4, b = -2, c = 6$

(3) $a = 3, b = -2, c = -1$

(4) $a = 4, b = -5, c = 1$

108. Evaluate : $\lim_{x \to 2} \frac{x-2}{\sqrt[3]{x} - \sqrt[3]{2}}$

(1) $(2)^{1/3}$

(2) $3(2^{2/3})$

(3) $3^{2/3}.2$

(4) 0

109. If $y = \sqrt{\sin x + \sqrt{\sin x + \sqrt{\sin x + \ldots\ldots\infty}}}$,

then $\frac{dy}{dx} = ?$

(1) $\frac{\sin x}{1-2y}$

(2) $\frac{\cos x}{1-2x}$

(3) $\frac{\cos x}{2y-1}$

(4) $\frac{\sin x}{2x-1}$

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110. The value of $\frac{i^5 + i^6 + i^7 + i^8 + i^9}{(1+i)}$ is :

(1) $\frac{1}{2}(1+i)$

(2) $\frac{1}{2}(1-i)$

(3) 1

(4) $\frac{1}{2}$

111. How many permutations of the letter of the word 'APPLE' are there ?

(1) 60

(2) 50

(3) 55

(4) 100

112. Evaluate : $\lim_{n\to\infty} \frac{1+2+3+.....+n}{n^2}$

(1) $\frac{1}{2}$

(2) 0

(3) $\frac{3}{2}$

(4) $\frac{1}{3}$

113. What is the sum of series $\frac{1}{2}+\frac{1}{3^2}+\frac{1}{2^3}+\frac{1}{3^4}+\frac{1}{2^5}+\frac{1}{3^6}+\ldots\ldots\infty$?

(1) $\frac{2}{3}$

(2) $\frac{1}{8}$

(3) 1

(4) $\frac{19}{24}$

114. What is the centre of circle $x^2+y^2+6x-4y+4=0$?

(1) (0, –2)

(2) (3, –3)

(3) (1, –2)

(4) (–3, 2)

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Space For Rough Work

115. The foci of an ellipse are $(\pm 2, 0)$ and its eccentricity is $\frac{1}{2}$. What is the equation of ellipse, if it is given that its centre is at origin and axes are along the coordinate axes ?

(1) $\frac{x^2}{36}+\frac{y^2}{11}=1$

(2) $\frac{x^2}{9}+\frac{y^2}{25}=1$

(3) $\frac{x^2}{16}+\frac{y^2}{12}=1$

(4) $\frac{x^2}{36}+\frac{y^2}{20}=1$

116. If $A = [a_{ij}]$ is a scalar matrix of order $n \times n$ such that $a_{ij} = k$ for all i, then trace of A is equal to :

(1) $n + k$

(2) n/k

(3) n^2

(4) nk

e For Rough Work

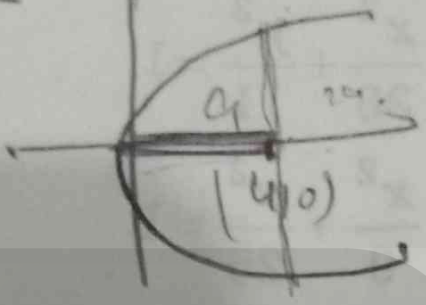
117. The focal distance of a point on the parabola $y^2 = 12x$ is 4. What is the abscissa of this point ?

(1) 1

(2) 0

(3) 2

(4) –2



118. If the straight line $2x + 3y + 4 + k(6x - y + 12) = 0$ is perpendicular to the line $7x + 5y - 4 = 0$, then what is the value of k ?

(1) $\frac{-29}{37}$

(2) $\frac{-7}{5}$

(3) –3

(4) $\frac{1}{\sqrt{3}}$

119. Evaluate : $\int_{-1}^{1}(x-[x])dx = ?$

$[x]$ = greatest integer function.

(1) x

(2) $x-1$

(3) 0

(4) 1

120. What is the rate of change of volume of a sphere with respect to its surface area, when the radius is 2 cm ?

(1) 2

(2) 1

(3) 0

(4) 5

121. Let $A = \{x : x \in R,\ x > 4\}$ and $B = \{x \in R : x < 5\}$, then $A \cap B = ?$

(1) $(4, 5]$

(2) $(4, 5)$

(3) $[4, 5)$

(4) $[4, 5]$

122. A solid is in the form of a cone mounted on a hemisphere. The radius and height of the cone are 3 m and 4 m. Find the volume of the given solid :

(1) $93.2\ m^3$

(2) $94.2\ m^3$

(3) $84.2\ m^3$

(4) $82.2\ m^3$

123. If a, b are the roots of equation $x^2 + x + 1 = 0$, then $\alpha^2 + \beta^2 = ?$

(1) 1

(2) -1

(3) 2

(4) 3

Space For Rough Work

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124. Let $f : R \to R$ be a function defined by $f(x) = [x]$, where $[x]$ is greatest integer function, then :

(1) f is one-one

(2) f is onto

(3) f is one-one and onto

(4) f is neither one-one nor onto

125. Solve :

$(a-b)^3 + (b-c)^3 + (c-a)^3 = ?$

(1) $(a+b+c)(a^2+b^2+c^2-ab-bc-ca)$

(2) $(a-b)(b-c)(c-a)$

(3) $3(a-b)(b-c)(c-a)$

(4) abc

126. The numerical value of a standard deviation can **never** be :

(1) Negative

(2) Zero

(3) Larger than variance

(4) None of the above

ce For Rough Work

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127. If the length of the shadow of a vertical tower is $\frac{1}{\sqrt{3}}$ times of its height, then the angle of elevation of the sun is :

(1) 45°
(2) 30°
(3) 90°
(4) 60°

128. Find :

$\cos 510° \cos 330° + \sin 390° \cos 120° = ?$

(1) 0
(2) –1
(3) $\frac{3}{4}$
(4) 1

129. The pair of equations $3x - 5y = 7$ and $-6x + 10y = 7$ have :

(1) A unique solution
(2) Infinitely many solutions
(3) No solution
(4) Two solutions

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130. If the mean of 10 numbers is 96 and one of the number is 150, then what is the mean of the remaining nine numbers ?

(1) 60 (2) 75

(3) 81 (4) 90

131. Every point on a number line represents :

(1) A unique real number

(2) A natural number

(3) A rational number

(4) An irrational number

132. What is the mean deviation from the mean of the numbers 10, 9, 21, 16, 24 ?

(1) 5.0 (2) 4.5

(3) 3.5 (4) 5.2

133. If a cylinder is covered by two hemispheres shaped lid of equal shape, then the total curved surface area of new object will be :

(1) $4\pi rh + 2\pi r^2$

(2) $4\pi rh - 2\pi r^2$

(3) $2\pi rh + 4\pi r^2$

(4) $2\pi rh + 4\pi r$

134. There is a triangle ABC in which a median AD is drawn from A to side BC. Find out the area of the triangle ABC, if the length of sides AB, BC and AD are respectively 10 cm, 18 cm and $\sqrt{41}$ cm :

(1) $40\sqrt{2}$ cm^2

(2) $20\sqrt{2}$ cm^2

(3) 60 cm^2

(4) 30 cm^2

135. A man is known to speak truth 3 out of 4 times. He throws a die and reports that it is a six. What is the probability that the number on the die is actually 6 ?

(1) $\frac{3}{8}$

(2) $\frac{5}{8}$

(3) $\frac{2}{7}$

(4) $\frac{1}{8}$

136. If a set contains n-elements, then what are the number of elements in its power set ?

(1) n

(2) 2^{n-1}

(3) 2^n

(4) n^2

137. If the perimeter of the circle and square are equal, then the ratio of their areas will be equal to : (use $\pi = \frac{22}{7}$)

(1) 14 : 11

(2) 22 : 7

(3) 7 : 22

(4) 11 : 14

138. If the arcs of same length in two circles subtended angles of 60° and 75° at their centres, then what is the ratio of their radii ?

(1) 1 : 2 (2) 2 : 3

(3) 3 : 1 (4) 5 : 4

139. If the mean and mode of some data are 4 and 10 respectively, its median will be :

(1) 1.5 (2) 5.3

(3) 6 (4) 16

ce For Rough Work

$2\pi r = 4 \times$ side.

140. If $x-2$ is a factor of $x^2+3ax-2a$, then $a=?$

(1) 2 (2) -2

(3) 1 (4) -1

141. What will be the domain of the function $f(x)=\sin^{-1}(2x-3)$?

(1) $[0,\infty)$

(2) $(1,2)$

(3) $[1,2]$

(4) $[-1,1]$

142. In a group of 50 persons, 14 drink tea but not coffee and 30 drink tea. How many drink tea and coffee both ?

(1) 15 (2) 16

(3) 20 (4) 30

For Rough Work

143. If $\cos A + \cos^2 A = 1$, then the value of $\sin^2 A + \sin^4 A$ is :

(1) 1
(2) $\frac{1}{2}$
(3) 0
(4) -1

144. The range of the function $f(x) = \frac{x+2}{|x+2|}$, $x \neq -2$ is :

(1) $\{-1, 0, 1\}$
(2) $\{-1, 1\}$
(3) $\{1\}$
(4) $(0, \infty)$

145. If the mean of a distribution is 25 and the standard deviation is 8. What is the value of the coefficient variation ?

(1) 35%
(2) 60%
(3) 32%
(4) 47%

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146. If the mode of 8, 15, 7, 7, 9, 2, 9 and x is 9, then 'x' is :

(1) 7

(2) 8

(3) 9

(4) 15

147. Let R be the relation on N defined by $x + 2y = 8$, the domain of R is :

(1) {2, 4, 8}

(2) {2, 4, 6, 8}

(3) {2, 4, 6}

(4) {1, 2, 3, 4}

148. If $f : [0, \infty) \to R$ and $g : R \to R$ be defined as $f(x) = \sqrt{x}$ and $g(x) = -x^2 - 1$, then find gof :

(1) $\sqrt{x-1}$

(2) $-x - 1$

(3) $x + 1$

(4) gof does not exist

Space For Rough Work

149. The sides of a triangle are 122 m, 22 m and 120 m respectively, then area of the triangle is :

(1) 1300 sq. m.

(2) 1320 sq. m.

(3) 1400 sq. m.

(4) 1420 sq. m.

150. If A and B are two mutually exclusive events with $P(A)=\frac{1}{3}$ and $P(B)=\frac{1}{4}$, then $P(\overline{A}\cap\overline{B})$ is :

(1) $\frac{4}{12}$

(2) $\frac{5}{12}$

(3) $\frac{6}{12}$

(4) $\frac{7}{12}$