CAREERS360

KLU ENGINEERING ENTRANCE EXAM (KLUEEE)

SAMPLE PAPER
MATHEMATICS

Mathematics

81. The eccentricity of the hyperbola $x=\frac{a}{2}\left(t+\frac{1}{t}\right), y=\frac{a}{2}\left(t-\frac{1}{t}\right)$ is

(A) $\sqrt{3}$ (B) $\sqrt{2}$ (C) $2\sqrt{3}$ (D) $3\sqrt{2}$

82. The polar equation of $x^3=y^2(2a-x)$ is

(A) $r\cos\theta=2a\sin^2\theta$ (B) $r\cos\theta=2a\cos^2\theta$

(C) $r\sin\theta=2a\sin^2\theta$ (D) $r\sin\theta=2a\cos^2\theta$

83. The foot of the perpendicular from the point $(3,3\pi/4)$ on the line $r(\cos\theta-\sin\theta)=6\sqrt{2}$ is

(A) $(1,\pi/3)$ (B) $(6,7\pi/4)$ (C) $(-3,\pi/2)$ (D) $(3,2\pi/4)$

84. If $y=\tan(3\tan^{-1}x)$ then $y_2(1-3x^2)-12xy_1=$

(A) $6(y-x)$ (B) $6(y+x)$ (C) $6y$ (D) $-6x$

85. If $\int\frac{\cos x}{\cos 2x}dx=A\ \ln\left|\frac{1+\sqrt{2}\sin x}{1-\sqrt{2}\sin x}\right|+c$, then A =

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

86. If $\int e^{3x}\sin 4x\,dx=e^{3x}(a\sin 4x+b\cos 4x)+c$, then a-b =

(A) $\frac{3}{25}$ (B) $\frac{4}{25}$ (C) $\frac{-1}{25}$ (D) $\frac{7}{25}$

87. $\int\frac{\sin^9 x}{\cos^{11} x}dx=$

(A) $\frac{\tan^9 x}{9}+c$ (B) $\frac{\tan^{10} x}{10}+c$ (C) $\frac{\tan^{11} x}{11}+c$ (D) $\frac{\tan^8 x}{8}+c$

Space for Rough Work

88. $\int_0^{\pi/4}(\tan^{n-2}x+\tan^n x)dx=$ (when n ≠ (A)

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

89. $\int_3^5\sqrt{(5-x)(x-3)}\,dx=$

(A) $\frac{\pi}{2}$ (B) $\frac{\pi}{6}$ (C) $\frac{\pi}{12}$ (D) $\frac{\pi}{4}$

90. If $\log_{10}100=2, \log_{10}101=2.004, \log_{10}102=2.0086, \log_{10}103=2.0128$ then

$\int_{100}^{103}\log_{10}x\,dx$ by Trapezoidal rule is

(A) 6.0193 (B) 6.0019 (C) 6.1093 (D) 6.11993

91. The area of the region bounded by y = [x] and the ordinates x = 1, x = 2 in sq. units is

(A) 2 (B) 1 (C) 4 (D) 1/2

92. Degree and order of the differential equation $\left[\frac{d^2y}{dx^2}\right]^{3/2}=\left(\frac{dy}{dx}+y\right)$

(A) 2, 3 (B) 3, 2 (C) 3, 3 (D) 2, 2

93. The solution of the equation $\log\frac{dy}{dx}=ax+by$ is

(A) $\frac{e^{by}}{b}=\frac{e^{ax}}{a}+c$ (B) $\frac{e^{-by}}{-b}=\frac{e^{ax}}{a}+c$ (C) $\frac{e^{-by}}{a}=\frac{e^{ax}}{b}+c$ (D) $e^{ax}+e^{bx}=c$

94. Solution of $\left(\frac{x+y-1}{x+y-2}\right)\frac{dy}{dx}=\left(\frac{x+y+1}{x+y+2}\right)$, given that y = 1 when x = 1, is

(A) $\log\left|\frac{(x-y)^2-2}{2}\right|=2(x+y)$ (B) $\log\left|\frac{(x-y)^2+2}{2}\right|=2(x-y)$

(C) $\log\left|\frac{(x+y)^2+2}{2}\right|=2(x-y)$ (D) $2(y-x)+\log\left(\frac{(x+y)^2-2}{2}\right)=0$

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SET – 3

95. If $f: R \to R$ and $g: R \to R$ are defined by $f(x) = 2x + 3$ and $g(x) = x^2 + 7$, then values of x such that $g(f(x)) = 8$ are

(A) 1, 2 (B) -1, 2 (C) -1, -2 (D) 1, -2

96. Equations of the lines passing through (1, 1) and making an angle $\frac{\pi}{4}$ with $2x - y - 7 = 0$ are

I) $x + 2y = 3,\ 2x + y = 3$ II) $x - y = 0,\ x + y = 2$

III) $x + 3y = 4,\ 3x - y = 2$ IV) $3x + y = 4,\ x - 3y + 2 = 0$

(A) II, III (B) III, II (C) III, III (D) II, II

97. Statement - I : The difference of the slopes of the lines $3x^2 - 8xy - 3y^2 = 0$ is 10/3

Statement –II : The difference of the slopes of the lines

Which of the above two statements are true

(A) only I true (B) only II only (C) both are true (D) neither I nor II

98. If $\bar{a}$ is a unit vector, $\bar{a} \times \bar{r} = \bar{b}, \bar{a}.\bar{r} = c$, then $\bar{r} =$

(A) $c\bar{a} - (\bar{a} \times \bar{b})$ (B) $c\bar{b} - (\bar{a} \times \bar{b})$ (C) $c\bar{a} + (\bar{a} \times \bar{b})$ (D) $c\bar{b} + (\bar{a} \times \bar{b})$

99. If the function $f: (-\infty, \infty) \to B$ defined by $f(x) = -x^2 + 6x - 8$ an onto function, then B =

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

100. If $10^n + 3.4^n + k$ is divisible by 9 for all $n \in N$, then the least value of k is

(A) 1 (B) 5 (C) 14 (D) 23

101. If tan3A = x; tan6A = y; tan 9A = z then $\frac{x + y - z}{xyz} =$

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

102. If $x = \sin^3 20^\circ - \frac{3}{4} \sin 20^\circ$ and $y = \cos^3 10^\circ - \frac{3}{4} \cos 10^\circ$ then

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

103. $A + B = 45^\circ$ then $(1 + \tan A)(1 + \tan B) =$

(A) 1 (B) 2 (C) 3 (D) 4

104. The number of roots of the equation $2\sin^2\theta + 3\sin\theta + 1 = 0$ in $(0, 2\pi)$ is

(A) 1 (B) 2 (C) 3 (D) 4

Space for Rough Work

SET – 3

105. The value of $Sin^{-1}\left(\frac{-\sqrt{3}}{2}\right) + 2Cos^{-1}\left(\frac{-1}{2}\right)$ is equal to

(A) 2π (B) π (C) $\pi/2$ (D) $3\pi/2$

106. If tanh x = 3/5, then tanh 3x =

(A) 64/63 (B) 63/65 (C) 53/65 (D) 43/65

107. If the angles of a triangle ABC be in A.P., then .

(A) $c^2 = a^2 + b^2 - ab$ (B) $b^2 = a^2 + c^2 - ac$

(C) $a^2 = b^2 + c^2 - ac$ (D) $b^2 = a^2 + c^2$

108. If in a triangle ABC, (s – a) (s – b) = s(s – c), then angle C is equal to

(A) 90° (B) 45° (C) 30° (D) 60°

109. The angles of elevations of the top of a tower form the points at a distance of 40, 90 meters from it are complementary. Then the height of the tower is .

(A) 40 (B) 50 (C) 60 (D) 20

110. The least positive integer n for which $\frac{(1+i)^n}{(1-i)^{n-2}}$ is a real number is

(A) 1 (B) 2 (C) 3 (D) 4

111. If the roots of $Z^n = 1$ are $1, \alpha, \alpha^2, \ldots \alpha^{n-1}$ then $1 + \alpha + \alpha^2 + \ldots + \alpha^{n-1} =$

(A) i (B) $-i$ (C) 0 (D) α^n

112. If $1 + w + w^2 = 0$ and $w^3 = 1$ then $(1 - w)(1 - w^2)(1 - w^4)(1 - w^8) =$

(A) 9 (B) -9 (C) 4 (D) - 4

113. Let 'O' be the origin and A, B be two points. $\bar{p}, \bar{q}$ are vectors represented by $\overline{OA}, \overline{OB}$ and their magnitudes are p, q respectively. Unit vector bisecting $\angle AOB$ is

(A) $\frac{\frac{\bar{p}}{p} + \frac{\bar{q}}{q}}{\left|\frac{\bar{p}}{p} + \frac{\bar{q}}{q}\right|}$ (B) $\frac{\frac{\bar{p}}{p} - \frac{\bar{q}}{q}}{\left|\frac{\bar{p}}{p} - \frac{\bar{q}}{q}\right|}$ (C) $\frac{\bar{p}}{p} + \frac{\bar{q}}{q}$ (D) $\frac{\bar{p}}{p} - \frac{\bar{q}}{q}$

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114. If $\bar{a}$ is a vector then $(\bar{a}.\bar{i})^2+(\bar{a}.\bar{j})^2+(\bar{a}.\bar{k})^2=$

(A) $\bar{a}^2$ (B) $2\bar{a}^2$ (C) $3\bar{a}^2$ (D) $4\bar{a}^2$

115. If $\bar{a}=3\bar{i}-\bar{j}-2\bar{k}, \bar{b}=2\bar{i}+3\bar{j}+\bar{k}$, then $(\bar{a}+2\bar{b})\times(2\bar{a}-\bar{b})=$

(A) $-25\bar{i}+35\bar{j}-55\bar{k}$ (B) $25\bar{i}-35\bar{j}+55\bar{k}$ (C) $25\bar{i}+35\bar{j}-55\bar{k}$ (D) $-25\bar{i}-35\bar{j}-55\bar{k}$

116. Let a, b, c be distinct non-negative numbers. If the vectors $a\bar{i}+a\bar{j}+c\bar{k}, \bar{i}+\bar{k}, c\bar{i}+c\bar{j}+b\bar{k}$ lie on a plane, then 'c' is

(A) A.M. of a and b (B) G.M. of a and b (C) H.M. of a and b (D) $(ab)^2$

117. A : $f(x) = \log x^3$ and $g(x) = 3 \log x$ are equal functions

R : Two functions f and g are said to be equal if their domains and codomains are equal and $f(x) = g(x)\ \forall x$ in their domain.

(A) Both A and R are true and R is the correct explanation of A

(B) Both A and R are true but R is not correct explanation of A

(C) A is true but R is flase (D) A is false but R is true

118. The point to which the origin should be shifted in order to eliminate x and y terms in the equation $x^2 + y^2 - 2ax - 4ay + a^2 = 0$ is

(A) (a,-2a) (B) (-a,2a) (C) (-a, –2a) (D) (a, 2a)

119. If the centroid of a triangle formed by the points (a, 0,0), (0,b, 0), (0,0,c) is $\left(\frac{2}{3},\frac{1}{3},1\right)$ then ascending order of a,b,c is

(A) a, b,c (B) c, b, a (C) b, a, c (D) b, c, a

120. If a line makes angles 60°, 60° with the positive x-axis and y-axis then the angle made by the line with positive z-axis is

(A) 0 (B) 45° or 135° (C) 60° or 120° (D) 90°

121. The direction ratios of a normal to the plane passing through (0, 0,1), (0, 1, 2) and (1,2, 3) are

(A) (0, 1, –1) (B) (1, 0, –1) (C) (0, 0, –1) (D) (1, 0, 0)

Space for Rough Work

122. Let $y = mx$ and $y = m^1x$ be the lines represented by the equation $ax^2 + 2hxy + by^2 = 0$. Match the following and choose the correct answer

List - I	List - II
I) m+ m1	a) $\frac{2\sqrt{h^2-ab}}{\lvert b \rvert}$
II) $\frac{1}{m}+\frac{1}{m^1}$	b) $\frac{-2h}{b}$
III) mm^1	c) $\frac{-2h}{a}$
IV) $\lvert m-m^1 \rvert$	d) $\frac{2}{b}$
	e) $\frac{a}{b}$

(A) b, d, c,a (B) b, c, d,a (C) c,d,b,e (D) b, c, e,a

123. The lines 2x + 3y = 6, 2x + 3y = 8 cut the x-axis at A,B respectively. The line 'l' drawn through the point (2, 2) meets the x-axis at C in such a way that the abscissae of A, B, C are in A.P. Then the equation of the line 'l' is

(A) 2x + 3y = 10 (B) 3x + 2y = 10 (C) 2x – 3y = 10 (D) 3x – 2y = 10

124. If l, m, n are in A.P then the lines represented by $lx + my + n = 0$ are concurrent at the point

(A) (1,2) (B) (2,4) (C) (-2,1) (D) (1,-2)

125. If xy + 2x + 3y + c = 0 represents a pair of lines then c =

(A) 2 (B) 3 (C) 4 (D) 6

126. The value of f at x = 0 so that the function $f(x)=\frac{\sin 2x}{x}$ is continuous at x = 0 is

(A) 2 (B) 4 (C) 6 (D) 0

127. If $\underset{x\to 0}{Lt}\frac{\sin 2x + a\sin x}{x^3}$ be finite, then the value of a and the limit are given by

(A) – 2, 1 (B) – 2, – 1 (C) 2, 1 (D) 2, – 1

Space for Rough Work

128. If $y = \log\left(\frac{1+x}{1-x}\right)^{1/4} - \frac{1}{2}Tan^{-1}x$, then $\frac{dy}{dx}$

(A) $\frac{x}{1-x^2}$ (B) $\frac{x^2}{1-x^4}$ (C) $\frac{x}{1+x^4}$ (D) $\frac{x}{1-x^4}$

129. Derivative of $Tan^{-1}\left(\frac{\sqrt{1+x^2}-1}{x}\right)$ wrt $Tan^{-1}\left(\frac{2x}{1-x^2}\right)$

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

130. If f(a) = 2, f^1(a) = 1, g(a) = – 1, g^1(a) = 2, then $\underset{x \to a}{Lt} \frac{g(x)f(a) - g(a)f(x)}{x-a}$

(A) – 5 (B) $\frac{1}{5}$ (C) 5 (D) $-\frac{1}{5}$

131. A stone projected vertically upward moves according to the law $s = 48t - 16t^2$. The time taken by the stone to reach the point of projection is ________ (t is in sec)

(A) 1 sec (B) 2 sec (C) 3 sec (D) 6 sec

132. The two curves $y = \frac{x+3}{x^2+1}, y = \frac{x^2-7x+11}{x-1}$ at (2,1)

(A) touch each other (B) cut orthogonally (C) cut at an angle of 45^0 (D) none

133. If $f(x) = x^2 + ax + 1 > 0 \ \forall x \in R$ then range of a is

(A) (–2, 2) (B) (0, 3) (C) (–3, 0) (D) $(-\infty, -2) \cup (2, \infty)$

134. If u = log(tan x + tan y) then $\sin 2x \frac{\partial u}{\partial x} + \sin 2y \frac{\partial u}{\partial y} =$

(A) 0 (B) 1 (C) 2 (D) –1

135. If the product of the roots of the equation $x^2 - 3kx + 2e^{2\log k} - 1 = 0$ is 17 then k =

(A) 5 (B) 3 (C) 2 (D) 9

136. If $p(p-r)x^2 + q(r-p)x + r(p-q) = 0$ has equal roots then 2 / q =

(A) $\frac{1}{p} + \frac{1}{r}$ (B) $\frac{1}{p} - \frac{1}{r}$ (C) p + r (D) pr

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137. If 2, 3 are the roots of the equation $2x^3 + px^2 - 13x + q = 0$, then (p, q) =

(A) (–5, –30) (B) (–5, 30) (C) (5, –30) (D) (5, 30)

138. If α, β, γ are the roots of $x^3 + 2x^2 - 3x - 1 = 0$, then $\alpha^2 + \beta^2 + \gamma^2 =$

(A) 8 (B) 10 (C) 14 (D) 15

139. If $A = \begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{bmatrix}$ then A is

(A) an idempotent marix (B) nilpotent matrix
(C) involuntary (D) orghogonal matrix

140. The system of equations 3x - 2y + z = 0, λx – 14y + 15z = 0 and x + 2y - 3z = 0 have non -zero solution, then λ =

(A) 1 (B) 3 (C) 5 (D) 0

141. $\begin{vmatrix} (200)^2 & (201)^2 & (202)^2 \\ (201)^2 & (202)^2 & (203)^2 \\ (202)^2 & (203)^2 & (204)^2 \end{vmatrix} =$

(A) 1 (B) 2 (C) -8 (D) 8

142. The number of triangles formed by the vertices of a decagon such that atleast one side is in common

(A) 60 (B) $10_{C_3} - 70$ (C) 70 (D) $10_{C_3} - 10$

143. If $a_n = \sum_{r=0}^{n} \frac{1}{n_{C_r}}$ then $\sum_{r=0}^{n} \frac{r}{n_{C_r}} =$

(A) (n – 1) a_n (B) na_n (C) $\frac{1}{2}$na_n (D) $\frac{1}{2}a_n$

144. The number of rational numbers p / q, where p, q ∈ {1, 2, 3, 4, 5, 6} is

(A) 27 (B) 23 (C) 36 (D) 35

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145. When 2549 is divided by 13, the remainder is
(A) 12 (B) 2 (C) 6 (D) 9

146. Coefficient of x^6 in $(1+x)^6+(1+x)^7+\dots+(1+x)^{15}$ is
(A) $^{16}C_{14}$ (B) $^{16}C_{10}$ (C) $^{16}C_7$ (D) $^{16}C_9$

147. If the remainders of the polynomial f(x) when divided by x + 1 and x – 1 are 3, 7; then the remainder of f(x) when divided by $x^2 - 1$ is
(A) 3x + 5 (B) 2x + 7 (C) 2x + 5 (D) 3x + 7

148. Coefficient of x^{10} in the expansion of $(2+3x)e^{-x}$ is:
(A) $\frac{-26}{(10)!}$ (B) $\frac{-28}{(10)!}$ (C) $\frac{-30}{(10)!}$ (D) $\frac{-32}{(10)!}$

149. $\frac{1}{2x-1}+\frac{1}{3}\cdot\frac{1}{(2x-1)^3}+\frac{1}{5}\cdot\frac{1}{(2x-1)^5}+\dots\dots=$
(A) $\frac{1}{2}\log\left(\frac{x}{x-1}\right)$ (B) $\frac{1}{2}\log\left(\frac{x-1}{x}\right)$ (C) $\frac{1}{2}\log\left(\frac{x}{1-x}\right)$ (D) $\frac{1}{2}\log\left(\frac{1-x}{x}\right)$

150. Assertion ((A): $P(A\cap\overline{B})=P(A)-P(A\cap B)$
Reason (R): If $B\subset A$, $P(A\cap\overline{B})=P(A)-P(B)$
(A) Both A and R are true and R is the correct explanation of A
(B) Both A and R are true but R is not correct explanation of A
(C) A is true but R is flase (D) A is false but R is true

151. In a convex hexagon two diagonals are drawn at random. The probability that the diagonals intersect at an interior point of the hexagon is
(A) $\frac{5}{12}$ (B) $\frac{7}{12}$ (C) $\frac{2}{5}$ (D) $\frac{4}{5}$

152. There are 10 pair of shoes in a cup board from which 4 shoes are picked at random. The probability that there is atleast one pair is
(A) $\frac{99}{323}$ (B) $\frac{224}{323}$ (C) $\frac{2}{5}$ (D) $\frac{3}{5}$

153. The mean of a binomial distribution is 25. Then the standard deviation lies in the interval
(A) [0,5) (B) (0, 0.25) (C) (0,5) (D) (0, 25)

Space for Rough Work

154. A random variable x has its range {0, 1, 2, 3,....}. If $P(x=r)=\frac{c(r+1)}{2^r}$ for r = 0, 1, 2... then c=
(A) 2 (B) 1/2 (C) 4 (D) 1/4

155. The equation of the diameter of the circle $(x-2)^2+(y+1)^2=16$ which bisects the chord cut of by the line x - 2y - 3 = 0
(A) 2x + y - 3 = 0 (B) x + 2y - 3 = 0 (C) x - y + 1 = 0 (D) 2x - y - 3 = 0

156. The circle with centre (2, 3) and intersecting $x^2+y^2-4x+2y-7=0$ orhogonally has the radius
(A) 1 (B) 2 (C) 3 (D) 4

157. The equation of the normal to the circle $x^2+y^2-8x-2y+12=0$ at the point whose ordinate is '–1' is
(A) 2x - y + 7 = 0 (B) 2x - y - 7 = 0 (C) 2x + y + 9 = 0 (D) 2x + y + 9 = 0

158. The equation of the axis of the parabola $9y^2-16x-12y-57=0$ is
(A) 2x – 3 = 0 (B) y – 3 = 0 (C) 3y – 2 = 0 (D) x + 3y – 3 = 0

159. The angle made by a common tangent of the ellipse $\frac{x^2}{16}+\frac{y^2}{12}=1$ and the circle $x^2+y^2=15$ with the major axis of the ellipse is
(A) $\frac{\pi}{6}$ (B) $\frac{\pi}{4}$ (C) $\frac{\pi}{3}$ (D) $\frac{\pi}{2}$

160. Distance between the Focii of the hyperbola $\frac{x^2}{9}-\frac{y^2}{16}=1$ is
(A) 10 (B) 12 (C) 16 (D) 9

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