

VERSION CODE

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Answer Sheet No.

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K I I T U N I V E R S I T Y

K I I T E E - 2 0 1 1

QUESTION BOOKLET

**B.TECH(4 YEARS) / B.TECH & M.TECH –DUAL DEGREE/
B.TECH & MBA – DUAL DEGREE/
BIOTECH - DUAL DEGREE
PART-II**

(PAGES: 25 - 40)

MATHEMATICS

Candidate's Signature

Invigilator's Signature

Roll No. _____

MATHEMATICS

101. If $\cos\theta + \cos^2\theta + \cos^3\theta = 1$ and $\sin^6\theta = a + b \sin^2\theta + c \sin^4\theta$ then $a + b + c$ is equal to
(A) 0 (B) 1 (C) -1 (D) 2
102. The number of values of x in $[0, 5\pi]$ satisfying $3 \cos 2x - 10 \cos x + 7 = 0$ are
(A) 4 (B) 8 (C) 6 (D) 10
103. Taking only principal values, the values of $\cos^{-1}\left(-\frac{1}{2}\right) + \sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)$ is equal to
(A) $\frac{2\pi}{3}$ (B) $-\frac{\pi}{3}$
(C) $\frac{\pi}{3}$ (D) $\frac{\pi}{4}$
104. The range of x for which the formula $2\sin^{-1}x = \sin^{-1}(2x\sqrt{1-x^2})$ holds is
(A) $\frac{1}{\sqrt{2}} \leq x \leq \frac{1}{2}$ (B) $-\frac{1}{\sqrt{2}} \leq x \leq \frac{1}{\sqrt{2}}$
(C) $-\frac{1}{\sqrt{3}} \leq x \leq 1$ (D) $-\frac{1}{\sqrt{2}} \leq x \leq 1$
105. The values of x which satisfy the equation $6 \sin^{-1}\left(x^2 - 6x + \frac{17}{2}\right) = \pi$ are
(A) 2, 4 (B) 3, 1
(C) 1, 3 (D) -1, -2
106. Find the non zero value of x for which the matrix $A = \begin{pmatrix} 1 & -3 & 4 \\ -5 & x+2 & 2 \\ 4 & 1 & x-6 \end{pmatrix}$ is singular.
(A) 21 (B) 19
(C) 35 (D) 17
107. Find the values of x & y for which the matrix $S = A^2 - xA + yI$ turns out to be null matrix where $A = \begin{pmatrix} 4 & 3 \\ 2 & 5 \end{pmatrix}$?
(A) $x=3, y=5$ (B) $x=5, y=7$
(C) $x=9, y=14$ (D) $x=7, y=13$