

## Mathematics ECAT Pre Engineering Online Test

| Sr | Questions                                                                                                                                 | Answers Choice                                                                                                    |
|----|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 1  | If $\sin x + \sin^2 x = 1$ , then the value of $\cos^{12} x + 3\cos^{10} x + 3\cos^8 x + \cos^6 x + 2\cos^4 x + \cos^2 x - 2$ is equal to | A. 0<br>B. 1<br>C. 2<br>D. $\sin^2 x$                                                                             |
| 2  | The maximum value of $\sin \theta \cos \theta$ is                                                                                         | A. 1<br>B. $1/2$<br>C. $1/4$<br>D. $1/6$                                                                          |
| 3  | If $\cos 20^\circ = K$ and $\cos x = 2K^2 - 1$ , then the possible values of $x$ between $0^\circ$ and $360^\circ$ are                    | A. $140^\circ$<br>B. $50^\circ$ and $140^\circ$<br>C. $50^\circ$ and $130^\circ$<br>D. $40^\circ$ and $320^\circ$ |
| 4  | If $\sin \theta$ and $\cos \theta$ are the roots of the equation $ax^2 - bx + c = 0$ , then $a, b, c$ satisfy the relation                | A. $b^2 - a^2 = 2ac$<br>B. $A^2 - b^2 = 2ac$<br>C. $A^2 + b^2 = c^2$<br>D. $B^2 + a^2 = 2ac$                      |
| 5  | Question Image                                                                                                                            | A. Less than 1<br>B. Equal to 1<br>C. Greater than 1 but less than 2<br>D. Greater than or equal to 2             |
| 6  | If $n$ is odd the expansion $(a + x)^n$ has middle terms                                                                                  | A. 2<br>B. 3<br>C. 4<br>D. 5                                                                                      |
| 7  | The middle term of the expansion $(1 + 2x)^6$ is _____                                                                                    | A. 1st term<br>B. 4th term<br>C. 2nd term<br>D. 5th term                                                          |
| 8  | The expansion $(1 + x)^{-3}$ holds when                                                                                                   | A. $ x  > 1$<br>B. $ x  < 1$<br>C. $x < 1$<br>D. $x > 1$                                                          |
| 9  | 1st four terms of the expansion $(1-x)^{-2}$ are                                                                                          | A. $1 + 2x + 3x^2 + 4x^3$<br>B. $3x^2 + 2x + 1$<br>C. $1 + 3x + 4x^2 + 5x^3$<br>D. None of these                  |
| 10 | ${}^nC_2$ exists when $n$ is _____                                                                                                        |                                                                                                                   |
| 11 | Question Image                                                                                                                            | A. $n < 8/5$<br>B. $n < 5/8$<br>C. $ n  < 8/5$<br>D. $ n  > 8/5$                                                  |
| 12 | Number of terms in the expansion of $(a+x)^n$ is                                                                                          | A. $n - 1$<br>B. $n + 1$<br>C. $n + 2$<br>D. $n + 3$                                                              |
| 13 | Question Image                                                                                                                            | A. Imaginary<br>B. Rational<br>C. Irrational<br>D. Real numbers                                                   |
| 14 | $(0.90)^{1/2}$ is equal to                                                                                                                | A. 0.99<br>B. 0.90<br>C. 0.80<br>D. 0.88                                                                          |
| 15 | Question Image                                                                                                                            |                                                                                                                   |

|    |                                                                                                            |                                                                                                                                                                             |
|----|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16 | $(0.90)^{1/2}$ is equal to                                                                                 | A. 0.99<br>B. 0.90<br>C. 0.80<br>D. 0.88                                                                                                                                    |
| 17 | The term involving $x^4$ in the expansion of $(3 - 2x)^7$ is                                               | A. 120<br>B. 1512<br>C. 1250<br>D. 15120                                                                                                                                    |
| 18 | $(51)^4$ is equal to                                                                                       | A. 7065201<br>B. 8065201<br>C. 6765201<br>D. 6565201                                                                                                                        |
| 19 | $7^{2n} + 3^{n-1} \cdot 2^{3n-3}$ is divisible by                                                          | A. 24<br>B. 25<br>C. 9<br>D. 13                                                                                                                                             |
| 20 | $(2.02)^4$ is equal to                                                                                     | A. 16<br>B. 16.6496<br>C. 17<br>D. 18                                                                                                                                       |
| 21 | When we expand $(a + 2b)^5$ then                                                                           | A. $a^5 + 10a^4b + 40a^3b^2 + 80a^2b^3 + 80ab^4 + 32b^5$<br>B. $a^5 + a^4b + a^3b^2 + a^2b^3 + ab^4 + b^5$<br>C. $5a^5 + 4a^4b + 3a^3b^2 + 2a^2b^3 + ab^4 + b^5$<br>D. None |
| 22 | For every positive integers n $1+5+9+\dots+(4n-3)$ is                                                      | A. $n(2n-1)$<br>B. $(2n-1)$<br>C. $n-1$<br>D. n                                                                                                                             |
| 23 | Question Image                                                                                             | A. 3/8<br>B. 7/8<br>C. 1/8<br>D. None                                                                                                                                       |
| 24 | Question Image                                                                                             | A. ${}^nC_r$<br>B. ${}^{n+1}C_{r+1}$<br>C. ${}^nC_{r+1}$<br>D. None                                                                                                         |
| 25 | If $(1+x-2x^3)^6 = 1+a_1x+a_2x^2+a_3x^3+\dots$ the the value of $a_2+a_4+a_6+\dots+a_{12}$ will be         | A. 32<br>B. 31<br>C. 64<br>D. 1024                                                                                                                                          |
| 26 | The greatest integer which divides the number $101^{100} - 1$ is                                           | A. 100<br>B. 1000<br>C. 10000<br>D. 100000                                                                                                                                  |
| 27 | If $(1+x)^n = C_0 + C_1x + C_2x^2 + \dots + C_nx^n$ then $C_0C_2 + C_1C_3 + C_2C_4 + \dots + C_{n-2}C_n =$ |                                                                                                                                                                             |
| 28 | Question Image                                                                                             | A. $ab = -1$<br>B. $ab = 1$<br>C. $ab = 2$<br>D. None                                                                                                                       |
| 29 | If the 4th term in the expansion of $(px + x^{-1})^m$ is 2.5 for all $x \in R$ , then                      |                                                                                                                                                                             |
| 30 | The greatest term in the expansion of $(3+2x)^9$ , when $x=1$ is                                           | A. 4th<br>B. 4th and 5th<br>C. 5th<br>D. 6th                                                                                                                                |