AICEE 2022 SAMPLE SET 1 (Maths)	
Q1.	A function $f: N \rightarrow N$ is defined by $f(x)=x^2+12$. What is the type of function here? a) bijective b) surjective c) injective d) neither surjective nor injective Answer: c
Q2.	Let '*' be a binary operation on N defined by $a*b=a-b+ab^2$, then find 4*5. a) 9 b) 88 c) 98 d) 99 Answer: d
Q3.	Let '*' be a binary operation defined by a*b=4ab. Find (a*b)*a. a) $4a^2$ b b) $16a^2$ b c) $16ab^2$ d) $4ab^2$ Answer: b
Q4.	If the order of the matrix is m×n, then how many elements will there be in the matrix? a) mn b) m^2 n^2 c) mn^2 d) 2mn Answer: a
Q5.	Which of the following is not a possible ordered pair for a matrix with 6 elements. a) (2,3) b) (3,2) c) (1,6) d) (3,1) Answer: d
Q6.	Which of the following condition is true for equal vectors?

	They are parallel to the same line They have the same magnitude and direction They have the same direction but not same magnitude They have the same initial point
Q7.	. Which of the following is the valid differential equation $x = a\cos(\alpha t + \beta)$? ☑ $d^2x/dt^2 + \alpha^2x = 0$ ☐ $d^2x/dt^2 - \alpha^2x = 0$ ☐ $d^2x/dt^2 - \alpha x = 0$ ☐ $d^2x/dt^2 + \alpha x = 0$
Q8.	Which of the following is a scalar quantity? ☐ 7 m/s towards east ☐ $55m/s^2$ ☑ $80m^3$ ☐ 5 Newton
Q9.	Find the sum of the vectors $\vec{a}$ =8i^+5j^ and $\vec{b}$ =-2i^+6j^ ☐ 6i^+j^ ☑ 6i^+11j^ ☐ 6i^-11j^ ☐ i^+11j^
Q10.	A particle starts from the origin with a velocity 5cm/sec and moves in a straight line, its acceleration at time t seconds being $(3t^2 – 5t)cm/sec^2$. What will be the distance from the origin at the end of 4 seconds? ☐ Unpredictable ☑ 30(2/3) ☐ 30 ☐ 30(4/3)

Q11.	Which of the given qualities is a vector? Speed Volume Time Weight
Q12.	Find the value of k for which the points (3,2), (1,2), (5,k) are collinear. a) 2 b) 5 c) 4 d) 9 Answer: a
Q13.	Find the equation of the line joining A(5,1), B(4,0) using determinants. a) 4x-y=4 b) x-4y=4 c) x-y=4 d) x-y=0 Answer: c
Q14.	Find the area of the triangle with the vertices (2,3), (4,1), (5,0). a) 3 sq.units b) 2 sq.units c) 0 d) 1 sq.unit Answer: c
Q15.	A particle moving in a straight line covers a distance of x cm in t second, where $x = t^3 + 6t^2 - 15t + 18$. What will be the acceleration of the particle at the end of 2 seconds? ☐ $22cm/sec^2$ ☐ $23cm/sec^2$ ◉ $24cm/sec^2$ ☐ $25cm/sec^2$
Q16.	What will be the increment of the differentiable function $f(x) = 2x^2 - 3x + 2$

	when x changes from 3.02 to 3? 0.16 0.016 0.018 0.18
Q17.	For which of the values of x, the rate of increase of the function $y=3x^2-2x+7$ is 4 times the rate of increase of x? ☐ -1 ☑ 1 ☐ 1/3 ☐ 0
Q18.	Lagrange's mean value theorem is also called as _____ ☐ a special case of Rolle's theorem ☐ Rolle's theorem ☐ Euclid's theorem ☑ the mean value theorem
Q19.	Find the angle between the planes x + 2y + 3z + 1 = 0 and (4, 1, -7). ☑ - 29.34 ☐ - 17.54 ☐ 3.43 ☐ 11.23
Q20.	A particle moves with uniform acceleration along a straight line and describes distances 21m, 43m and 91m at times 2, 4 and 7 seconds, respectively.What is the velocity of the particle in 3 seconds? ☐ 41m/sec ☐ 31 cm/sec ☑ 11m/sec ☐ 21m/sec

Q21.	A particle is moving in a straight line and its distance s cm from a fixed point in the line after t seconds is given by $s = 12t - 15t^2 + 4t^3$. What will be the distance between the two positions of the particle at two times, when the velocity is instantaneously 0? ☐ 29/4 cm ☉ 27/4 cm ☐ 27/2 cm ☐ 29/2 cm
Q22.	A particle moves in a straight-line OA; the distance of the particle from O at time t seconds is x ft, where $x = a + bt + ct^2$ (a, b > 0). What is the meaning of the constant b? ☐ Mid velocity ☉ Initial velocity ☐ Final velocity ☐ Arbitrary velocity
Q23.	One motor car A stands 24m in front of a motorcycle B. Both starts from rest along a straight road in the same direction. If A moves with uniform acceleration of 2 m/sec^2 and B runs with a uniform velocity of 9 m/sec, is it possible for B to overtake A? ☐ Yes ☐ Data not sufficient ☉ No ☐ Answer cannot be determined
Q24.	Given, $f(x) = x^3 - 12x^2 + 45x + 8$. What is the maximum value of f(x)? ☐ 54 ☉ 62 ☐ 61 ☐ 63
Q25.	A particle moves in a straight line and its velocity v at time t seconds is given by$v = 3t^2 - 4t + 5$ cm/second. What will be the distance travelled by

	the particle during first 3 seconds after the start? 21 cm 24 cm 22 cm 23 cm
Q26.	What will be the maxima for the function $f(x) = x^4 - 8x^3 + 22x^2 - 24x + 8$? ☐ 1 ☐ 3 ☑ 2 ☐ 0
Q27.	Bag 1 contains 3 red and 5 black balls while another Bag 2 contains 4 red and 6 black balls. One ball is drawn at random from one of the bags and it is found to be red. Find the probability that it is drawn from bag 2. ☐ 31/62 ☑ 16/31 ☐ 16/62 ☐ 31/32
Q28.	A dice is thrown, what is the probability of getting an even number? ☐ 1/8 ☐ 1/4 ☑ 1/2 ☐ 1/6
Q29.	Find the angle between $2x + 3y - 2z + 4 = 0$ and (2, 1, 1). ☐ 38.2 ☐ 89.21 ☑ 29.34 ☐ 19.64
Q30.	If $P(A) = 5/13$, $P(B) = 7/13$ and $P(A \cap B) = 3/13$, evaluate $P(A \mid B)$.

	a) 1/7 b) 3/7 c) 3/5 d) 2/7 Answer: b