

GIRLS CADET COLLEGE MARDAN

ENTRY TEST FIRST YEAR MODEL PAPER- MATHEMATICS

Total Marks: 50

Time allowed: 1:00 hour

Instruction: Use of calculator is not allowed.

Q1: Multiple choice Questions.

(20 marks)

1.	What should be added to $x^2 + 5x$ to make it a perfect square? A. $5/2$ B. $25/4$ C. $10x$ D. $2x$	2.	What are the number of solutions of the equation $x^4 - x^3 + 2x - 1 = 0$ A. No solution B. One solution C. two solutions D. four solutions
3.	When $\omega^3 = 1$, then $\omega^{12} + \omega^{27} + \omega^{81} = ?$ A. 1 B. 3 C. 5 D. 7	4.	$ax^2 + bx + c = 0$ is a quadratic equation where A. $a = 0$ B. $a \neq 0$ C. $b \neq 0$ D. $c \neq 0$
5.	The sum of the cube roots of unity is equal to A. 0 B. 1 C. 2 D. 3	6.	Find the constant of variation, when s a t^2 and $t = 10$ when $s = 5$. A. $1/5$ B. $1/20$ C. $1/25$ D. $1/30$
7.	The comparison of two different quantities is known as _____ A. Rate B. Ratio C. Proportion D. None	8.	If $2a + 1 : 21 = 4 : 7$, then A. $a = 11/2$ B. $a = 9/2$ C. $a = 13/2$ D. $a = 15/2$
9.	If A has two elements and B has three elements, then number of binary relations in $A \times B$ is A. 2×3 B. 2^2 C. 2^6 D. 2^3	10.	Which of the following is an example of a disjoint set? A. $\{0,2,4,6\}$ and $\{2,4,6,8\}$ B. $\{0,3,6,9\}$ and $\{9,10,16,25\}$ C. $\{0,4,8,12\}$ and $\{6,10,14,18\}$ D. $\{1,2,3,4\}$ and $\{1,2,3\}$
11.	What is Mode of the data 5,7,9,7,6,8,7,11,10,11 A. 7 B. 8 C. 10 D. 11	12.	$\sqrt{\frac{\sum f(x-\bar{x})^2}{\sum f}}$ is called _____ A. Mean B. Median C. Standard deviation D. Variance
13.	_____ is the nth root of the product of given values in a data. A. Arithmetic Mean B. Geometric Mean C. Harmonic Mean D. Median	14.	$\frac{1}{x^2 - 1} =$ A. $\frac{1}{x+1} - \frac{1}{x-1}$ B. $\frac{1}{2(x+1)} - \frac{1}{2(x-1)}$ C. $\frac{1}{2(x-1)} - \frac{1}{2(x+1)}$
15.	Let f be a function from A to B, then f is _____ function if $Range f = B$ and there is no repetition in $Range f$. A. Injective B. Surjective C. Bijective D. None	16.	Which of the following statement is true? A. $Mode < Median < Mean$ B. $Mode < Median > Mean$ C. $Mode > Median > Mean$ D. $Mean > Median > Mode$

17.	In which quadrant the angle -270° lies? A. I B. II C. III D. IV	18.	Let $x \propto y$ and $y \propto \frac{1}{z}$ A. $x \propto z$ B. $y \propto \frac{1}{z}$ C. $x \propto \frac{1}{z}$
19.	Find the two numbers when the ratio between them is 8:3 and their difference is 20 A. 30, 12 B. 32, 12 C. 32, -12 D. 16, 6	20.	Which of the following is not a relation from $A = *1, 2, 3+$ to $B = *4, 5+$? A. $*(1, 4)(1, 5)+$ B. $*(2, 5)+$ _____ C. $*(3, 4)(5, 3)+$ D. $*(1, 4)(2, 5)(3, 4)+$

Q2: Attempt all questions. Each part carries 05 marks.

(Marks: 30)

- i. Solve: $\sqrt{4x + 5} = 2x - 5$
- ii. Calculate Range, Variance and standard deviation for the following ungrouped data

x	5	10	11	13	15
f	2	3	4	- 1	5
- iii. Solve by partial fraction: $\frac{x-1}{x^2+6x+5}$
- iv. (a) What are the two conditions for a binary relation to be a Function?
(b) Identify the type of the following functions when $A = *1, 2, 3+$, $B = *a, b, c, d+$
 1. $f_1 = *(1, a), (2, a), (3, b)+$
 2. $f_2 = *(1, a), (2, b), (3, c)+$
 3. $f_3 = *(1, a), (1, b), (2, c)+$
- v. A light house is 150 m above the sea level. Angle of depression of a boat from its top is 60° . Find the distant between the boat and the light house.