

PLUS ONE SAMPLE QUESTION PAPER

MATHEMATICS

Time : 1½ hour

Total Score: 60

General Instructions to Candidates:

- The first 5 minutes is cool-off time.
- You may use the time to read the questions and plan your answers.
- Answer only on the basis of instructions and questions given.
- Consider score and time while answering.

Answer all 6 questions. Each carries 3 score

(8 x 3 = 24)

- The equation of the circle with centre at the origin and radius 'r' is _____ [1]
 - Find the centre and radius of the circle $x^2 + y^2 + 8x - 10y - 8 = 0$ [2]
- n^{th} term of a GP with first term 'a' and common ratio 'r' is _____ [1]
 - The fourth term of a GP is square of its second term and the first term is - 3. Determine the 7th term. [2]
- A coin is tossed twice. What is the probability that a least one tail occurs? [1]
 - If E and F are two events such that $P(E) = \frac{1}{4}$, $P(F) = \frac{1}{2}$ and $P(E \cap F) = \frac{1}{8}$.
Find a. P(E or F)
b. P (not E and not F) [2]
- A committee of 3 persons is to be constituted from a group of 2 men and 3 women.
 - In how many ways this can be done? [1]
 - How many of these committees would consist of atleast 1 man? [2]
- The number of terms in the expansion of $(a + b)^{2n}$ is _____ [1]
 - Expand $\left(x^2 - \frac{1}{x}\right)^4$ using binomial theorem. [2]
- Consider the following table : [3]

Class	0-10	10-20	20-30	30-40	40-50
Frequency	5	8	15	16	6

(i) Find mean.

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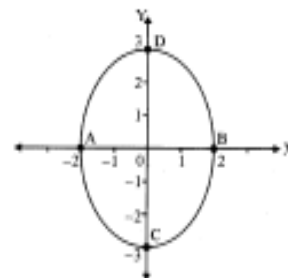
- (ii) Find variance.
 (iii) Find standard deviation.
7. (i) If A and B are two sets such that $A \subset B$, then $A \cup B = \underline{\hspace{2cm}}$. [3]
 (ii) Write the set $\{x : x \text{ is a positive integer and } x^2 < 40\}$ in the Roster form.
 (iii) Write all the subsets of $\{2\}$.
8. (i) $25^\circ = \underline{\hspace{2cm}}$ radian. [3]
 (ii) Find the value of $\sin 15^\circ$.
 (iii) Prove that $\frac{\sin 3x + \sin x}{\cos 3x + \cos x} = \tan 2x$

Answer all 4 questions. Each carries 4 scores (6 x 4 = 24)

9. (i) The length of latus rectum of the parabola $y^2 = 10x$ is [2]
 (ii) Find the equation of the parabola with focus (0,-3) and directrix $y = 3$ [2]
10. (i) Solve the inequality $2(x-1) < 3(x-2)$ [2]
 (ii) Show the solution of the inequality on number line [2]
11. i) Identify the octant in which the point (-3, 2,-1) lies. [1]
 ii) Check whether the points A(0, 7, 10) B(-1, 6, 6) and C(-4, 9, 6) represent the vertices of a right angled triangle. [3]
12. i) Find the equation of the line 'l', that cuts off equal intercepts on the coordinate axes and passes through the point (2, 3). [2]
 ii) Find the distance of the point (-3, 2) from 'l'. [2]
13. i. Derivative of $f(x) = 1 + x + x^2 + x^3 + \dots + x^{50}$ at $x = 1$ is [2]
 A. 50 B. 1250 C. 1275 D. $\frac{101}{2}$
 ii. Find $\lim_{x \rightarrow 0} f(x)$ if it exists. Where [2]

$$f(x) = \begin{cases} |x|, & x \neq 0 \\ x, & \\ 0, & \text{if } x=0 \end{cases}$$

14. i. Let A(1,2) be a fixed point and 'P' be a variable point in the same plane. P moves in the plane in such a way that its distance from A is always a constant. Suppose 'P' is at the point (3,5), find the equation of the path traced by 'P'. [2]
 ii. Consider the following ellipse: [2]



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a. Find the equation of the ellipse.

b. Find the co-ordinates of foci.

Answer the question which carries 6 scores

(6 x 2 = 12)

15. The sum of first three terms of a Geometric progression $\frac{13}{12}$ is and their product is -1. Find the common ratio and the terms. [6]

16. Find $\lim_{x \rightarrow 2} f(x)$ if

i) $f(x) = \frac{x^4 - 16}{x^3 - 8}$ [3]

ii) $f(x) = \begin{cases} x^2, & x \leq 2 \\ 2x, & x > 2 \end{cases}$ [3]



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