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)**

1. i) The equation of the circle with centre at the origin and radius ' r' is _____ **[1]**

ii) Find the centre and radius of the circle $x^2 + y^2 + 8x - 10y - 8 = 0$ **[2]**

2. i) n^{th} term of a GP with first term 'a' and common ratio 'r' is _____ **[1]**

ii) The fourth term of a GP is square of its second term and the first term is - 3. Determine the 7^{th} term. **[2]**

3. i. A coin is tossed twice. What is the probability that a least one tail occurs? **[1]**

ii. 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]**

4. A committee of 3 persons is to be constituted from a group of 2 men and 3 women.

i. In how many ways this can be done? **[1]**

ii. How many of these committees would consist of atleast 1 man? **[2]**

5. i. The number of terms in the expansion of $(a + b)^{2n}$ is _____ **[1]**

ii. Expand $\left(x^2 - \frac{1}{x}\right)^4$ using binomial theorem. **[2]**

6. 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.

(ii) Find variance.

(iii) Find standard deviation.

7. (i) If A and B are two sets such that $A \subset B$,then $A \cup B$ = _____. **[3]**

(ii) Write the set { x : x is a positive integer and $x^2 < 40$ } in the Roster form.

(iii) Write all the subsets of { 2 }.

8. (i) 25° = _____ radian. **[3]**

(ii) Find the value of sin 15°.

(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. a. i^{18} = ... **[1]**

i. 1 ii. 0

iii. -1 iv. i

b. Express $\left(-\sqrt{3}+\sqrt{2}\right)\left(2\sqrt{3}-i\right)$ in the form of $a+ib$ **[3]**

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 '/', 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 '/'. **[2]**

13. i. Derivative of $f(x) = 1 + x + x^2 + x^3 + ... + x^{50}$ at x = 1 is **[2]**

A. 50 B. 1250 C. 1275 D. $\frac{101}{2}$

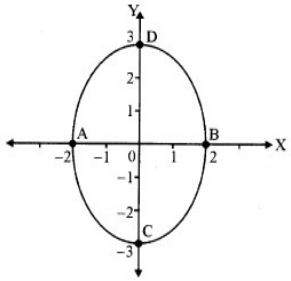
ii. Find $\lim_{x \to 0} f(x)$ if it exists. Where **[2]**

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

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]**



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 $\lim_{x\to 2} f(x)$ if

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

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


EXAM WINNER
PLUS TWO
BATCHES
+2 UVAH
+2 VEDHA
FREE
exam winner