

**Guess Paper – 2014
Class – XI
Subject – Mathematics**

M.M.-100

TIME-3hrs.

GENERAL INSTRUCTIONS:

- 1. All questions are compulsory.*
- 2. The question paper consist of 29 questions divided into three sections A, B and C. Section A comprises of 10 questions of one mark each, section B comprises of 12 questions of four marks each and section C comprises of 07 questions of six marks each.*
- 3. All questions in Section A are to be answered in one word, one sentence or as per the exact requirement of the question.*

SECTION -A

$1 \times 10 = 10$

Q.1. List all the subsets of the set $\{-1,0,1\}$.

Q.2. Find the value of $\cos 105^\circ$

Q.3. Express $(5-3i)^3$ in the form of $a+ib$

Q.4. In how many ways can 6 person be seated in a row?

Q.5. In a G.P. the third term is 24 & sixth term is 192. Find the tenth term.

Q.6. Write the equation of the line through the points (1,-1) & (3,5).

Q.7. Find the equation of ellipse whose ends of major axis $(0, \pm\sqrt{5})$ & ends of minor axis $(\pm 1, 0)$.

Q.8. Evaluate $\lim_{x \rightarrow 1} \frac{1 - \frac{1}{x}}{\sin(x - 1)}$.

Q.9. In a single throw of three die. Find the probability of getting a total of 17 or 18.

Q.10. In the binomial expansion of $(a + b)^n$, the coefficients of the fourth & thirteenth terms are equal to each-other. Find n.

SECTION-B

4x12=48

Q.11. Given $A = \{-1, 0, 2, 5, 6, 11\}$, $B = \{-2, -1, 0, 18, 108\}$ & $f(x) = x^2 - x - 2$. Is $f(A) = B$? find $f(A)$.

Q.12. Find the value of $\tan \frac{\pi}{8}$

OR

Prove that $\cos 2x \cos x/2 - \cos 3x \cos 9x/2 = \sin 5x \sin 5x/2$

Q.13. Prove using the principle of mathematical induction for all $n \in \mathbb{N}$.

$$1 \cdot 3 + 2 \cdot 3^2 + 3 \cdot 3^3 + \dots + n \cdot 3^n = \frac{(2n - 1)3^{n+1} + 3}{4}$$

14. Find real θ such that $3 + 2i \sin \theta$ is purely real.

Q.15. Find the number of arrangement of the letter of the word "INDEPENDENCE". In how many of these arrangements

(i) do the words start with P.

(ii) do all the vowels always occur together.

(iii) do the vowels never occur together.

(iv) do the words begins with I and end in P

Q.16. If f is a function satisfying $f(x+y)=f(x).f(y)$ for all

$x,y \in \mathbb{N}$. Such that $f(1)=3$ and $\sum_{x=1}^n f(x) = 120$. Find the value of n .

Q.17. Find the coordinates of the foot of perpendicular from the point $(-1,3)$ to the line $3x-4y-16=0$.

Or

Find the image of the point $(3,8)$ with respect to the line $x+3y=7$ assuming the line to be a plane mirror.

Q.18. If p and q are the lengths of perpendicular from the origin to the lines $x\cos\theta - y\sin\theta = k\cos 2\theta$ and $x\sec\theta + y\csc\theta = k$ respectively. Prove that $p^2 + 4q^2 = k^2$.

Q.19. Find the equation of the hyperbola with foci $(0, \pm 3)$ and vertices $(0, \pm \frac{\sqrt{11}}{2})$.

Q.20. find the equation of the circle passing through (0,0) and making intercepts a and b on the coordinates axes.

Q.21. Find the equation of the set of point P the sum of whose distances from A(4,0,0) and (-4,0,0) is equal to 10.

Q.22. Find the derivative of $f(x) = x \sin x$ from first principle.

SECTION-C

6X7=42

Q.23. Let $A = \{1,2,4,5\}$, $B = \{2,3,4,6\}$, $C = \{4,5,6,7\}$ verify the following identities :

(1) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

(2) $A \cap (B - C) = (A \cap B) - (A \cap C)$

(3) $A - (B \cap C) = (A - B) \cup (A - C)$

Q.24. (1) If $\sin \theta = n \sin(\theta + 2\alpha)$, prove that $\tan(\theta + \alpha) = \frac{1+n}{1-n} \tan \alpha$.

(2) Solve $2\cos^2 x + 3\sin x = 0$

Q.25. Solve the inequality graphically : $4x+3y\leq 60$, $y\geq 2x$, $x\geq 3$, $x,y\geq 0$.

Q.26. Find n, if the ratio of the fifth term from the beginning to the fifth term from the end in the expansion of $\left(\sqrt[4]{2} + \frac{1}{\sqrt[4]{3}}\right)^n$ is $\sqrt{6} : 1$.

Q.27. If the first and the nth term of a G.P are a and b respectively and if P is the product of n terms, prove that $P^2=(ab)^2$

Q.28. On her vacation veena visits four cities (A,B,C,D) in a random order.what is the probability that she visits

- (1) A before B**
- (2) A before B and B before C.**
- (3) A first and B last**
- (4) A either first or second**

Q.29 Find the mean deviation about median for the following data.

| | | | | | | |
|--------------------|-------------|--------------|--------------|--------------|--------------|--------------|
| Marks | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 |
| No of girls | 6 | 8 | 14 | 16 | 4 | 2 |

Or

Calculate the mean ,variance,and S.D for the following data

| | | | | | | | |
|------------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|
| Class | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 |
| Frequency | 3 | 7 | 12 | 15 | 8 | 3 | 2 |

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