Guess Paper – 2014
Class – XI
Subject – Mathematics

1. A survey of 500 television viewers, 285 watch foot ball, 195 watch hockey,115 watch basket ball,45 watch foot ball and basket ball, 70 watch foot ball and hockey, 50 watch hockey and basket ball and 50 do not watch any of the three games.How many watch all the three games?

2. The larger hand of a clock is 42cm long.How many cms does its extremity move in 20 Minutes ?

OR

Find $\sin\frac{x}{2}$ and $\cos\frac{x}{2}$ if $\cos x = \frac{-1}{3}$, $\frac{\pi}{2} \le x \le \frac{3\pi}{2}$

3. Find the ratio in which the line joining the points(2,4,16) and (3,5,-4) is divided by the plane 2x-3y+z+6=0.Also find the point of division

4. If $\frac{(a+i)^2}{(2a-i)} = p + iq$,Show that $p^2 + q^2 = \frac{(a^2+1)^2}{(4a^2+1)}$,where $i = \sqrt{-1}$

5. Find the domain and range of f(x)= $\sqrt{9-x^2}$

OR

Let f(x) = x +1, g(x) = 2 x – 3 be two functions defined over the set of real numbers.Find f+g, fg, $\frac{f}{g}$ and gg

6. At what point on the parabola y^2 =8x where the ordinate is three times ther abscissa.

OR

Find the equation of the ellipse with foci at ($\pm$ 3,0) and passing through (4,1).

7. How many three digit odd numbers can be formed by using the digits 2,3,4,5,6,7 when repetition of digits allowed?

8. Evaluate $\lim_{x \to 1} \frac{x^2-2}{x^2-x} - \frac{1}{x^3-3x^2+2x}$ OR $\lim_{x \to \frac{\Pi}{2}} \frac{\tan 2x}{(x-\frac{\Pi}{2})}$

9. Differentiate w.r.t x : (a) sin 2 x (b) $\frac{x\sec x+\tan x}{x\sec x-\tan x}$

10.If ' a'and 'b' are the roots of

$x^2-3x+p=0$ *and* $'c'and'd'arethe\ roots\ of\ x^2-12x+q=0$ where a,b,c and d form a G.P.Prove that(q+p):(q-p) =17:15.

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11.Find the equation of the line passing through the point (3,-2) and is inclined at 60^0 to

The line $\sqrt{3}x + y = 1$.

12. Find the term independent of x in the expansion of $\left(3x^2 - \frac{1}{2x^3}\right)^{10}$

OR

If the coefficients of second,third and fourth

terms of $(1+x)^{2n}$ *are in A.P; Show that* $2n^2 - 9n + 7 = 0$.

13.In $(a+b)^n$,first three terms are 729,7290 and 30375,find a,b and n.

14.Prove that $(1+\cos\frac{\pi}{8})(1+\cos\frac{3\pi}{8})(1+\cos\frac{5\pi}{8})(1+\cos\frac{7\pi}{8}) = \frac{1}{8}$

OR

Prove that $\tan 4x = \frac{4\tan x(1-\tan^2 x)}{1-6\tan^2 x+\tan^4 x}$

15.Using properties of sets,show that (a)$A \cup (A \cap B) = A$ (b) $A \cap (A \cup B) = A$.

16.A delegation of 6 members is to be send abroad out of 12 members.In how many ways the selection be made so that a particular member is (1)included (2) excluded.

17.Find the image of the point (1,2) in the line x-3y+4=0.

18. Evaluate (a) $\lim_{x \to 1} \frac{(x + x^2 + x^3 + ... + x^n) - n}{x - 1}$ (b) $\lim_{x \to 0} \frac{\sin(3 + x) - \sin(3 - x)}{x}$

19.Using the definition of derivative ,find the derivative of $\cos(x - \frac{\Pi}{8})$

OR

Differentiate x secx from first principle.

20.A rod of length 12 cm moves with its ends always touching the co-ordinate axes .

Determi9ne the equation of the locus of a point on the rod which is 3 cm from the

end in contact with x-axis.

21.Solve graphically: x + y ≤5, 4 x + y ≥ 4, x +5 y ≥ 5, $x \leq 4$, y ≤ 3, $x \geq 0$, y≥0.

22. Convert $\frac{(1+i)(1+\sqrt{3}i)}{(1-i)}$ OR $1 + \cos\theta + i\sin\theta$ in polar form.

23.Prove that cotA+cot(60+A)- cot(60-A) =3 cot3A.

OR

Prove cos20. cos 40. cos60. cos 80 = $\frac{1}{16}$.

24.Find the equation of the circle passing through the points (4,1) and (6,5) and whose

Centre lies on the line 4x+y=16

OR

Prove that the points (1,6),(5,2),(5,0) and (-1,-4) are concyclic.

25. Find the sum : $\frac{1^3}{1}+\frac{1^3+2^3}{2}+\frac{1^3+2^3+3^3}{3}+\ldots\ldots\ldots\ldots\ldots\ldots to\ n\ terms$

OR

Find t_n and s_n for $1+(1+\frac{1}{2})+(1+\frac{1}{2}+\frac{1}{4})+(1+\frac{1}{2}+\frac{1}{4}+\frac{1}{8})+\ldots\ldots\ldots\ldots$

26.Prove by induction

$\cos\theta.\cos2\theta.\cos4\theta\ldots\ldots\ldots\ldots\ldots\ldots\cos(2^{n-1}\theta)=\frac{\sin(2^n\theta)}{2^n\sin\theta}$ for all $n\in N$

OR

$\frac{1}{1.2.3}+\frac{1}{2.3.4}+\frac{1}{3.4.5}+\ldots\ldots\ldots\ldots\ldots$n terms$=\frac{n(n+3)}{4(n+1)(n+2)}$

OR

Prove by induction that $11^{n+2}+12^{2n+1}$ is divisible by 133 for all natural numbers

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