**JIYA LAL MITTAL DAV PUBLIC SCHOOL**

**GRADE – XI SA-I (SEPT, 2015)**

**SUBJECT – MATHEMATICS**

**TIME: 3hrs. M.M-100**

**Note: (1) Write clean and clear.**

 **(2) All questions are compulsory.**

 **(3) Attempt questions serial wise.**

 **Section-A**

**Each question carry 1 marks.**

1. Write down all subset of {1, 2, 3}
2. Let $f\left(x\right)=x^{2} , g\left(x\right)=2x+1 , find \left(f-g\right)\left(x\right) .$
3. Find principle value of $tanx= -\frac{1}{\sqrt{3}} .$
4. Write Rule of P.M.I.
5. Express $(-5i)\left(-\frac{1}{8}i\right) $in the form of a+ib.
6. Solve: $-8\leq 5x-3<7$.
7. Define factorial and give its example.
8. Write down formula of Binomial Theorem.
9. Define power set.
10. Define Domain, range and co-domain.

**Section-B**

**Each questions carries 4 marks.**

1. Let V={a,e,i,o,u} and B={ a, i, k, u }. Find V-B and B-V.
2. Let A={ 1, 2, 3, 4, 6}. Let R be the relation on A defined by $\{\left(a,b\right):a,b \in A , b is exactly divisible by a\}$
3. Write R in Roster form.
4. Find the domain in R.
5. Find the range in R.
6. Find the radian of 25°.
7. Find the general solution of cos4x=cos2x.
8. By P.M.I, prove that $1^{2}+3^{2}+5^{2}+…………+(2n-1)^{2}=\frac{n\left(2n-1\right)\left(2n+1\right)}{3} $
9. Find the modulus and arguments of $z=-1-i\sqrt{3} $
10. Solve $\frac{3x-4}{2}\geq \frac{x+1}{4}-1 $. Show the graph of the solutions on number line.
11. Find $ P\_{r}= P\_{r-1}$ Or 2n$c\_{3}: c\_{3}=11:1$
12. A bag contain 5 black and 6 red balls. Determine the number of ways in which 2 Black and 3 red balls can be selected.
13. Using binomial theorem, evaluate (101)4.
14. Write the general term of $\left(x^{2}-y\right)^{6} $
15. If $\left(\frac{1+i}{1-i}\right)^{m}=1 $, then find the least positive integral value of m.

 **Section-C**

**Each question carries 6 marks:**

1. Find the domain of the function, $f\left(x\right)=\frac{x^{2}+2x+1}{x^{2}-8x+12}$ .
2. Prove that $Cos^{2}2x-Cos^{2}6x=Sin4x Sin8x .$
3. Prove that $cos4x=1-8sin^{2}x cos^{2}x$
4. By P.M.I, prove that

$$\frac{1}{1×4}+\frac{1}{4×7}+…………+\frac{1}{\left(3n-2\right)(3n+1)}=\frac{n}{\left(3n+1\right)} $$

1. Convert into polar form, $z=\frac{-16}{1+\sqrt{3} i} $
2. If $\left(a+ib\right)=\frac{\left(x+i\right)^{2}}{2x^{2}+1} prove that a^{2}+b^{2}=\frac{(x^{2}+1)^{2}}{(2x^{2}+1)^{2}} $

Or

$$If (x+iy)^{3}=u+iv, then show that \frac{u}{x}+\frac{v}{y}=4\left(x^{2}-y^{2}\right) $$

1. Solve inequalities graphically:

$3x+4y\leq 60 , x+3y\leq 30 , x\geq 0 , y\geq 0$ Or

A committee of 7 has to be formed from 9 Boys and 4 girls. In how many ways can this be done when the committee consists of?

1. Exactly 3 girls.
2. Atleast 3 girls.
3. Almost 3 girls