**GUESS PAPER 2013**

**CLASS - XII**

**SUB: MATHEMATICS**

**TIME 3 Hrs MM:100**

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***General Instructions:***

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

***(ii) The question paper consists 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 mark each and , Section C comprises of 7 questions of six mark each***

 ***(iii) All questions of Sections A are to be answered in one word, one sentence or as per the exact requirement of the question.***

***(iv) There is no overall choice. However, internal choice has been provided in 4 questions of four mark each and 2 questions of six marks each.***

***(v) Use of calculator is not permitted.***

 **SECTION - A (1 mark questions)**

1. ***Let ‘\*’ be a binary operation on the set of Natural numbers N defined by a\*b = l.c.m.(a,b) where a,b  N. Find (2\*3)\*6***
2. ***Find the principal value of ***
3. ***If A is a square matrix of order 3x3 and=8, then find the value of ***
4. ***Write the number of possible matrices of order  with each entry 5 or 7***
5. ***For what value of k the matrix  is singular?***
6. ***Find the slope of the normal to the curve  y=2t at t= 2***
7. ***Find the value of ***
8. ***Let and  be two vectors such that = ; 2 and=  then find the angle between and ***
9. ***If  ; ; find a unit vector in the direction of ***
10. ***Find the distance of the point (2,3,4) from the plane***

***.() = -11***

***SECTION - B (4 marks questions)***

***11. Show that the function  defined by  is one-one and onto function. Also find the inverse of the function f.***

***12.Solve the equation tan-1 + tan-1 = ***

 ***or***

***Prove that : .***

***13.Using properties of determinant prove that***

 *** = ( 5x +4 )(4-x)2***

***14.Discuss the continuity of the function f given by   at x = 1***

***15.If  prove that  16.Find , if***

 ***or***

***Find  if x =a(), y = a(1+cos)***

***17.Find the intervals for which the following function is increasing or decreasing***

 ******

 ***18. Evaluate :.***

 ***OR***

 ***Evaluate : .***

***19.Solve : x = y – x tan***

 ***Or***

 ***Solve: x2 dy + ( xy + y2) dx = 0; y=1 when x=1***

***20.The scalar product of the vector  with a unit vector along the sum of the vectors  and  is equal to one. Find the value of λ .***

***21.Find the distance of the point (-1,-5,-10) from the plane x-y+z=5 measured parallel to the line ***

***22.A random variable X has the following probability distribution find (i) k (ii) P(X1) (iii) P(X>3)***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ***X*** | ***0*** | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** |
| ***P(X)*** | ***0.1*** | ***k*** | ***0.2*** | ***2k*** | ***0.3*** | ***k*** |

 ***SECTION - C (6 mark questions)***

***23.Solve the following system of equations by matrix method. x + y +z =3 , 2x –y +z = -1 , 2x +y – 3z = -9***

***24. Show that the height of the greatest cylinders which can be inscribed***

 ***in a cone of height h is h.***

***25.Evaluate ***

 ***OR***

 ***Evaluate the integral as a limit of sum ***

***26.Find the area lying above the x axis and included between the circle  and the parabola y=4x***

***27.An aeroplane can carry a maximum of 200 passengers. A profit of Rs.1000 is made on each executive class ticket and a profit of Rs.600 is made on each economy class ticket. The airline reserves at least 20 seats for executive class. However, at least 4 times as many passengers prefer to travel by economy class than by the executive class. Determine how many tickets of each type must be sold in order to maximize the profit for the airline. Form an LPP and solve it graphically.***

***28. A factory, has three types of machines X, Y and Z producing 1000, 2000 and 3000 bolts per day respectively. The machine X produces 1% defective bolts, machine Y produces 1.5% and machine Z produces 2% defective bolts. At the end if a day, a bolt is picked at random and is found to be defective. Find the probability that this defective blot is produced by the machine X.***

***29. Find the co-ordinates of the foot from the point (0, 2, 3) on the line . Also find the length of the perpendicular.***

***OR***

***Find the image of the point P (1, 3, 4) in the plane .***