**GUESS PAPER-2013  
CLASS-XII  
SUBJECT- MATHEMATICS**

Time Allowed: 3 Hours M.M.: 80

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| *INSTRUCTIONS:* |
| 1. *All questions are compulsory.* |
| 1. *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.* |
| 1. *All questions in Section A are to be answered in one word, one sentence or as per the exact requirement of the question.* |
| 1. *Use of calculators is not permitted.* |

**Section-A**

1. Let A ={1,2,3},find the number of equivalence relations containing (1,2).
2. Find the principal value of tan-1(- ).
3. Find the value of x and y, if .
4. Construct a 2×2 matrix A=[aij],if aij=(i+j)2/2.
5. If A is an invertible matrix of order two then write the value of det(A-1)
6. Evaluate
7. Evaluate
8. Find the value of x for which the vector x(i+j+k) is a unit vector.
9. Find the projection of i+3j+7k on the vector 7i-j+8k.
10. Find the intercepts cut off by the plane 2x+y-z=5.

**Section-B**

1. Show that the function f:RR given by f(x)=x3 is injective.

OR

Show that f:[-1,1]R given by f(x)= is one-one .Find the inverse of the function f: [-1,1]Range of f.

1. Simplify: ,if
2. If F(x)= ,show that F(x) F(y)= F(x+y).
3. Find the value of k so that the function defined by f(x)= is constant at x=
4. If y=, -1,show that (1-x2) - x - a2y=0.
5. If I be any interval disjoint from (-1,1).Prove that the function f given by f(x)= x+ is strictly increasing on I.

OR

Find the equation of the tangent to the curve by x=asin3t , y=bcos3t at point where t=.

1. A die is thrown twice and the sum of the numbers appearing is observed to be 6.What is the conditional probability that the number 4 has appeared atleast once.
2. Integrate : OR
3. Find the general solution of differential equation: ylogy dx-xdy=0.
4. Solve the differential equation: (1+x2) +2xy= ; y=0 when x=1.
5. The scalar product of the two vector i+j+k with a unit vector along the sum of vectors 2i+4j-5k and i+2j+3k is equal to one. Find the value of
6. Show that the lines and are coplanar.

Or

Find the shortest distance between the lines whose vector equation are given (i+2j+3k)+λ(i-3j+2k) and = (4i+5j+6k)+(2i+3j+k).

**Section-C**

1. If A=,find A-1. Using A-1 solve the system of equations. 2x-3y+5z=11; 3x+2y-4z=-5; x+y-2z=-3.

Or

Using elementary operations find the inverse of .

1. If the length of sides of a trapezium other than base are equal to 10cm,then find the area of the trapezium when it is maximum.

Or

Prove that the volume of the largest cone that can be inscribed in a sphere of radius R is 8/27 of the volume of the sphere.

1. Using integration find the area of the region bounded by the triangle whose vertices are (1,0) and (2,2) and (3,1).
2. Find the equation of the plane which contains the line of intersection of the planes and and which is perpendicular to the plane .
3. In answering a question on a multiple choice questions test with four choices per question. A student knows the answer , guesses or copies the answer. If ½ is the probability that he knows the answer , ¼ be the probability he guesses it, and ¼ that he copies it. Assuming that a student who copies the answer will be correct with the probability ¾ .What is the probability that the student knows the answer given that he answered it correctly?Mehul doesnot know the answer to one of the question in the test. The evaluation process has a negative marking. Which value would Mehul violate if he restores to unfairness? How would his personality would be hampered?
4. Evaluate :
5. A manufacturer makes two types of toys A and B. Three machines are needed for this purpose and the time (in minutes) required for each toy on the the machines is given below

|  |  |  |  |
| --- | --- | --- | --- |
| Types of Toys | Machine I | Machine II | Machine III |
| A | 12 | 18 | 6 |
| B | 6 | 0 | 9 |

Each machine is available for a maximum of 6 hours per day. If the profit on each toy of type A is Rs. 7.50 and that on each toy of type B is Rs. 5,show that 15 toys of type A and 30 toys of type B should be manufactured in a day to get maximum profit.

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Mr. Deepak Vashishta

Rawal International School

09910949983