CBSE GUESS - 2015
Class – XII
Subject -Mathematics

Section A

Q.1 Find the principal value of $\tan^{-1}(\tan\frac{7\pi}{6}) + \cot^{-1}[\cot(\frac{7\pi}{6})]$

Q.2 Find the value of α for which $A^2 = B$, If
$A = \begin{bmatrix} \alpha & 0 \\ 1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 \\ 5 & 1 \end{bmatrix}$

Q.3 Evaluate $\int_0^a \frac{dx}{x^2-1}$

Q.4 Evaluate $\int \frac{Cos\sqrt{x}}{\sqrt{x}}$ dx

Q.5 A matrix A of order 3*3 has determinant 6, What is the value of $|3A|$?

Q.6 Area of a triangle with values (K,0),(1,1) and (0,3) is 5 Sp.units. Find the values of K.

Q.7 Write the differential equation representing the family of curves y = mx, where m is an arbititrary constant.

Q.8 Write the degree of order of the differential equation
$(\frac{dy}{dx})^4 + 3y\frac{d2y}{dx2} = 0$

Q.9 For what value of x, is the matrix
$A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ is a 5 key symmetry matrix

Q.10 Find the point on the curve y= x-4x+5, Where the tangent is parallel to x axis.

Section B

Q.11 Solve for X,

$\text{Tan}^{-1}(x+1) + \tan^{-1}(x-1) = \tan^{-1}\frac{8}{31}$

Q.12 If $y = \log[x+\sqrt{1+x2}]$, prove that
$(1+x^2)\frac{d2y}{dx2} + x\frac{dy}{dx} = 0$

Q.13 Show that
$$\begin{bmatrix} a & b-c & c+b \\ a+c & b & c-a \\ a-b & b+a & c \end{bmatrix} = (a+b+c)(a^2+b^2+c^2)$$

Q.14 If the fraction f(n) given by
$$F(n) = \begin{matrix} 3ax+b & : & x>1 \\ 11 & : & x=1 \\ 5ax-2b & : & x<1 \end{matrix}$$ is continuous at x=1, then find the values of a & b.

Q.15 Evaluate $\int \frac{x2dx}{(x2+1)(x2+4)}$

Q.16 Solve the following differential equation
$\text{Cosx}\frac{dy}{dx} + 2\sin x.y = \text{Sinx.cos}$

Section C

Q.23 Using elementary transformation find the inverse of the following matrix.
$$\begin{bmatrix} 2 & -1 & 4 \\ 4 & 0 & 2 \\ 3 & -2 & 7 \end{bmatrix}$$

Q.24 If $A = \begin{bmatrix} 2 & -3 & 5 \\ 3 & 2 & -4 \\ 1 & 1 & -2 \end{bmatrix}$, find $^{-1}$ using it to solve the following system of equation:
2x-3y+5z=16, 3x+2y-4z=-4,x+y-2z=-3

Q.25 Show that the right circular cyclinder open at the top, and of given surface area and
Maximum volume such that the height is equal to the radius of the base
.

Q.26 Evaluate $\int_2^5 (3x2-5)dx$ as limit of sum.

Q.27 One kind of cake require 300g of flour and 15g of fat, another kind of cake requires 150g

of flour and 30g of fat. Find the maximum number of cake which can be made from 7.5 Kg of flour and 600g of fat, assuring that there is no shortage of the other ingredients used in making the cake. Make it to an L.P.P and solve it graphically.

Q.28 Solve the differential equation Secx $\frac{dy}{dx}$ -y = Sinx

Q.29 Evaluate 1 $\int x(logx)2\,dx$

2 $\int_0^{\pi/4} \log(1+tanx)dx$

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