

BACHELOR OF PHARMACY (B. PHARM.) (CBCS-2019 COURSE)

B. Pharm. Sem-I :SUMMER- 2022

SUBJECT : REMEDIAL MATHEMATICS

Day : Saturday
Date : 23-07-2022

S-21326-2022

Time : 10:00 AM-01:00 PM
Max. Marks : 35

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of **log table** is allowed.

Q.1 Attempt any **ONE** of the following: **(10)**

a) Prove that $\int \sqrt{x^2 - a^2} dx = \frac{x}{2} \sqrt{x^2 - a^2} - \frac{a^2}{2} \log |x + \sqrt{x^2 - a^2}| + C$

Hence find $\int \sqrt{9x^2 - 5} dx$.

b) If $L^{-1}\{F(s)\} = f(t)$ and $g(t) = \begin{cases} f(t-a), & t > a \\ 0, & t < a \end{cases}$

then prove that $L^{-1}\{e^{-as}F(s)\} = g(t)$

Also find $L^{-1}\left\{\frac{3s+7}{s^2-2s-3}\right\}$

Q.2 Attempt any **FIVE** of the following: **(25)**

a) Show that the matrix $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$

satisfies the equation $A^2 - 4A - 5I = 0$ and hence find A^{-1} .

b) Solve the equations by Cramer's rule
 $x + y - 2z = 0, 2x + y - 3z = 0, 5x + 4y - 9z = 0..$

c) Find all the points of maxima and minima and corresponding maximum and minimum values of the function
 $f(x) = 2x^3 - 21x^2 + 36x - 20.$

d) Evaluate $\int_0^{\pi/2} \frac{\sin x}{\sin x + \cos x} dx$

e) Show that the points $A(a, a), B(-a, -a)$ and $C(-\sqrt{3}a, \sqrt{3}a)$ are the vertices of an equilateral triangle.

f) Solve the differential equation.
 $(x^2 - 4xy - 2y^2)dx + (y^2 - 4xy - 2x^2)dy = 0.$

g) Half-life of radium is 1600 yrs, calculate the disintegration constant.

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