

I/VI PHARM-D (REGULAR) EXAMINATIONS, DECEMBER - 2022

First Year

REMEDIAL MATHEMATICS

Time : Three Hours

Maximum : 70 Marks

SECTION - A

Answer any FIVE Questions.

5x14 = 70 M

1. a) Find the inverse of $\begin{bmatrix} 3 & 1 & -1 \\ 2 & -2 & 0 \\ 1 & 2 & -1 \end{bmatrix}$.

b) If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ then show that $A^2 - 4A - 5I = 0$.

2. a) If $\tan A = \frac{5}{6}$ and $\tan B = \frac{1}{11}$. Show that $(A+B) = \frac{\pi}{4}$.

b) If $\cos A = \frac{-12}{13}$ and $\cos B = \frac{24}{7}$. Find $\sin(A+B)$ and $\cos(A+B)$.

3. a) Find the value of x , if the slope of the line passing through $(2, 5)$ and $(x, 3)$ is 2 and find the straight line equation ?

b) Find the equation of circles with centre C and radius ' r ' where $C = (2, -3)$, $r = 4$.

4. a) Compute $\lim_{n \rightarrow \infty} (\sqrt{x^2 + x} - x)$.

b) If $\sin y = x \sin(a+y)$, then show that $\frac{dy}{dx} = \frac{\sin^2(a+y)}{\sin a}$. (a is not a multiple of π).

5. a) Evaluate $\int \frac{2x^3 - 3x + 5}{2x^2} dx$ for $x > 0$ and verify the result by differentiation.

b) Integrate $\int \frac{\cos^2 x}{1 + \sin x} dx$.

6. a) Solve $(D^2 - 4D + 3)y = 0$.

b) Solve $\frac{dy}{dx} = \frac{y^2 + 2y}{x-1}$.

7. By using the linearity property of Laplace transform, show that

(a) $L(\cosh at) = \frac{s}{(s^2 - a^2)}$.

(b) $L(t) = \frac{1}{s^2}$.



Total No. of Questions : 8]

P.D 1.6 A

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I/VI PHARMA-D (REGULAR) DEGREE EXAMINATIONS, DEC- 2021

First Year

REMEDIAL MATHEMATICS

(With Effective from 2008-2009 Admitted Batch)

Time : Three Hours

Maximum : 70 Marks

PART - A

Answer ALL Questions.

10x2 = 20 M

Each question carries 2 marks.

1. a) Find the product of the $\begin{bmatrix} a & ib \\ ib & a \end{bmatrix}$ and $\begin{bmatrix} c & id \\ id & c \end{bmatrix}$ where $i^2 = -1$.
- b) Find the value of $\cos 15^\circ$.
- c) Find the equation of the line containing the points (1, 2) and (1, -2).
- d) Show that $\lim_{n \rightarrow \infty} (\sin x \cos x) = 1$.
- e) If $y = e^x$, find $\frac{dy}{dx}$.
- f) Evaluate $\int \left(\sin 2\pi x + \frac{1}{x} \right) dx$.
- g) Find $\int_1^2 (x^3 + 2) dx$.
- h) Find order and degree of $\left(\frac{d^3 y}{dx^3} \right)^{\frac{2}{3}} = \frac{dy}{dx} + 2$.
- i) Find the Laplace transform of $e^{2t} + 4t^3$.
- j) Find the Laplace transform of $(\cos 2t)^2$.

PART - B

Answer any FIVE Questions.

5x10 = 50 M

Each question carries 10 marks.

2. a) Solve the following system of equations by matrix Inversion method :

$$x - y + 3z = 5, \quad 4x + 2y - z = 0, \quad x + 3y + z = 5.$$

[P.T.O.]

b) Show that $\begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix} = (a-b)(b-c)(c-a)$.

3. a) Prove that $\frac{\tan \theta + \sec \theta - 1}{\tan \theta - \sec \theta + 1} = \frac{1 + \sin \theta}{\cos \theta}$.

b) Find the value of $\sin 45 \cos 30 - \cos 45 \sin 30$.

4. a) Compute $\lim_{x \rightarrow 0} \left(\frac{\cos ax - \cos bx}{x^2} \right)$.

b) If for $x > 0$, $x^y = e^{x-y}$, prove that $\frac{dy}{dx} = \frac{x-y}{x(1+\log x)}$.

5. a) $z = x^2 + y^2 + x^2 y^2$, then find $\frac{\partial^2 z}{\partial x^2}$, $\frac{\partial^2 z}{\partial y^2}$.

b) If $u = \sin^{-1} \left(\frac{x+y}{\sqrt{x} + \sqrt{y}} \right)$, prove that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \frac{1}{2} \tan u$.

6. a) Evaluate $\int x(\cos x)^2 dx$.

b) Find $\int \frac{1}{5+4\cos x} dx$.

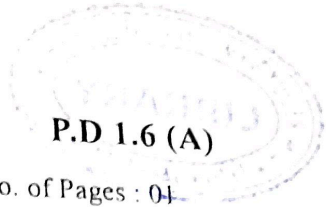
7. a) Solve $(x y^2 + x) dx + (y x^2 + y) dy = 0$.

b) Solve $\frac{dy}{dx} + y \tan x = (\cos x)^3$.

8. a) Find the Laplace transform of $e^{-3t} (2 \cos 5t - 3 \sin 5t)$.

b) Show that $L\{t \cos at\} = \frac{s^2 - a^2}{(s^2 + a^2)^2}$.





Total No. of Questions :07]

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I/VI Pharm.D (Regular) DEGREE EXAMINATIONS, JULY/AUGUST-2019
(Examination at the end of First year of 6 Year course)
REMEDIAL MATHEMATICS

Time: Three Hours

Maximum marks:70

Answer any FIVE questions.

All questions carry equal marks.

5X14=70M

- 1. a) Evaluate the cofactor of 'a' in the determinant $|3,-4,3; 2 \ 7 \ a; 5 \ -9 \ 2|$.
 b) Find the value of 'x' $|3-x \ 0 \ 0; 0 \ 4-x \ 3; 0 \ 3 \ 6-x|$
- 2. Prove that
 a) $\sin^2 x + \cos^2 x = 1$ b) $\sec^2 x - \tan^2 x = 1$
- 3. a) Determine the equation for straight line passing through the points (1,2) and (3,-4)
 b) Find the length of the perpendicular from (2,-3) to the line $2x-y+9=0$
- 4. a) Solve the Laplace transform of $\sin 2t \cos 3t$.
 b) Find the inverse Laplace transforms of $\log \left(\frac{s^2 + 1}{s^2 - 1} \right)$
- 5. Integrate
 a) $\int \sin^4 x \, dx$ b) $\int \cos^7 x \, dx$
- 6. Solve the equations
 a) $\left(\frac{d^4 x}{dt^4} \right) + 4x = 0$ b) $\left(\frac{d^3 y}{dx^3} \right) + y = 0$
- 7. Find the nth derivative of
 a) $\frac{x}{(x^2 + a^2)}$ b) $e^x \cos x \cos 2x$



I/VI Pharm.D (Regular/Supply) DEGREE EXAMINATIONS, SEP-2018
(Examination at the end of First Year of 6 Year Course)

Pharm.D

REMEDIAL MATHEMATICS

Time: Three Hours

Maximum marks:70

Answer any FIVE questions.

All questions carry equal marks.

5X14=70M

1. a) Find the value of λ $\begin{vmatrix} 3-\lambda & 0 & 0 \\ 0 & 4-\lambda & \sqrt{3} \\ 0 & \sqrt{3} & 6-\lambda \end{vmatrix} = 0$
- b) Prove that $\begin{vmatrix} (b+c)^2 & a^2 & a^2 \\ b^2 & (c+a)^2 & b^2 \\ c^2 & c^2 & (a+b)^2 \end{vmatrix} = 2abc(a+b+c)^3$
2. The lengths of side AB and side BC of a scalene triangle ABC are 12 cm and 8 cm respectively. The size of angle C is 59° . Find the length of side AC.
3. a) Find an equation for the line that passes through the coordinates (4,0) and (0,6)?
b) Find the slope of the line through (0,1) and (2;-3)?
4. a) Find the Laplace transform of $\sin 2t \sin 3t$.
b) Find the inverse Laplace transformation of $\frac{4s+5}{(s-1)^2(s+2)}$.
5. a) Find the equation of the curve passing through the point (1,1) whose differential equation is $xdy=(2x^2+1)dx$ ($x \neq 0$)
b) Find the general solution of the equation $(e^x + e^{-x})dy - (e^x - e^{-x})dx = 0$
6. a) Evaluate $\int_4^0 \sqrt{t(t-2)} dt$
b) Evaluate $\int \frac{e^x}{1+e^{2x}} dx$

7. Find the n^{th} derivative of

a) $\frac{1}{1+x^2}$

b) $y = \cos(ax+b)$



I/VI PHARM.D (Regular) DEGREE EXAMINATIONS, JULY/AUGUST- 2017

(Examination at the end of First year of 6 Year course)

Paper VI- REMEDIAL MATHEMATICS

Time: Three Hours

Maximum marks:70

Answer any FIVE questions.

All questions carry equal marks.

5X14=70M

1. a) Find the value of λ $\begin{vmatrix} 3 & -4 & -3 \\ 2 & 7 & \lambda \\ 5 & -9 & 2 \end{vmatrix} = 0$

b) Prove that $\begin{vmatrix} a & b & c \\ b+c & c+a & a+b \\ a^2 & b^2 & c^2 \end{vmatrix} = -(a-b)(b-c)(c-a)(a+b+c)$

2. The lengths of side AB and side BC of a scalene triangle ABC are 10cm and 8cm respectively. The size of angle C is 60° . Find the length of side AC.

3. a) Find the equation for the line that passes through the coordinates (2,4) and (0,4)?

b) Find the slope of the line through (-2,3) and (2,-3)?

4. a) Find the Laplace transform $t \sin 3t \cos 2t$.

b) Find the inverse Laplace transformation of $\frac{s}{s^4 + 4a^4}$

5. a) Find the equation of the curve passing through the point (2,1) whose differential equation is $x dy = (2x^2 + x + 1) dx$, where $(x \neq 0)$.

b) Find the general solution of the equation. $\sec^2 x \tan y dx + \sec^2 y \tan x dy = 0$

6. a) Evaluate $\int_0^1 te^{-t} \cdot \sin^4 t dt$

b) Evaluate $\int \frac{e^x}{1+e^{2x}} dx$

7. Find the nth derivative of

a) $\frac{x}{(x-1)(2x+3)}$

b) $\cos x \cos 2x \cos 3x$.

I/VI Pharm.D DEGREE EXAMINATIONS, AUGUST/SEPTEMBER-2016

PAPER-VI

REMEDIAL MATHEMATICS

Time: Three Hours

Maximum marks:70

Answer any FIVE questions.

All questions carry equal marks.

5X14=70M

1. Determine the rank of the matrix.

$$a) \begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 2 \\ 2 & 6 & 5 \end{bmatrix}$$

- b) Solve the equations
- $3x+y+2z=3$
- ,
- $2x-3y-z=-3$
- ,
- $x+2y+z=4$
- . using matrix method.

2. a) Calculate the length of the side
- $AC=x$
- of ABC triangle, given that
- $\sin \theta = 0.6$
- ,
- $BC=12$
- .

- b) Prove that
- $\sin^2 \theta + \cos^2 \theta = 1$

3. a) Equations of the two straight lines are
- $6x+4y+12=0$
- ,
- $6x+5y-9=0$
- . Find the equation of the straight line perpendicular to
- $3x+5y-21=0$
- and straight line passing through the point of intersection of the first two equations.

- b)
- $2x+2y-10=0$
- , find the equation of the parabola whose focus is the point
- $(-3,4)$
- .

4. a) Find the Laplace transform of
- $\frac{\cos at - \cos bt}{t}$

- b) Find the Laplace transform of
- $\frac{(4s+5)}{(s-1)^2(s+2)^2}$

5. a) Show that
- $f(x, y, z) = \frac{(4x^3 + 2y^2z)}{(x + 2y + 3z)}$
- is homogeneous.

- b) If
- $u = \sin^{-1}\left(\frac{x}{y}\right) + \tan^{-1}\left(\frac{y}{x}\right)$
- , prove that
- $x\left(\frac{du}{dx}\right) + y\left(\frac{du}{dy}\right) = 0$

6. a) Evaluate
- $\int e^x \cos(1+e^x) dx$

- b) Evaluate
- $\int_0^x \sin\left(2t + \frac{\pi}{2}\right) dt = \sqrt{\frac{3}{4}}$

7. Find the
- n^{th}
- derivative of

a) $e^{-x} \sin^2 x$

b) $e^x \cos x \cos 2x$