07/10/2020.

TDPH 6th Semester Practical Examination-2020

SET-1

MATHEMATICS

Paper-VIII (2014 Syllabus)
Group-A (Numerical Analysis)

Full Marks: 40 | Time: 3 hours

[Practical = 30 | Viva Voce = 05 | Note Book = 05]

Answer any **FIVE** questions $6 \times 5 = 30$

1. Find $f(34)$ using the following table

x	15	20	25	30	35
$f(x)$	4.2588	4.3427	4.4226	4.5556	4.5736

2. Find $f'(7.47)$ and $f''(7.47)$ using the following table

x	7.47	7.48	7.49	7.50	7.51
$f(x)$	0.193	0.195	0.198	0.201	0.203

3. Find the inverse of the matrix without finding its determinant

$$\begin{bmatrix} 3 & 2 & -4 \\ -1 & 5 & 2 \\ 2 & -3 & 4 \end{bmatrix}$$

4. Apply Gauss-Seidal method to solve the equations

$$\begin{aligned} 10x + 2y + z &= 9 \\ 2x + 20y - 2z &= 44 \\ -2x + 3y + 10z &= 22. \end{aligned}$$

5. Evaluate $\int_0^{10} \frac{dx}{1+x^2}$ by using Simpson's one third rule with step length=1. Give the result correct upto three points of decimal.

6. Find a real root of the equation $x^3 - 2x - 5 = 0$, using Regula-falsi method, correct to three decimal places.

Set 1

1)

x	$f(x)$	$\Delta f(x)$	$\Delta^2 f(x)$	$\Delta^3 f(x)$	$\Delta^4 f(x)$
15	4.2588				
		0.0839			
20	4.3427		-0.0040		
		0.0799		0.0571	
25	4.4226		0.0531		-0.2252
		0.1330		-0.1681	
30	4.5556		-0.1150		
		0.0180			
35	4.5736				

$u = \frac{x - x_n}{h} = \frac{34-35}{5} = -\frac{1}{5} = -0.2$

2)

x	$f(x)$	$\Delta f(x)$	$\Delta^2 f(x)$	$\Delta^3 f(x)$	$\Delta^4 f(x)$
7.47	0.193				
		0.002			
7.48	0.195		0.001		
		0.003		-0.001	
7.49	0.198		0.000		0.000
		0.003		-0.001	
7.50	0.201		-0.001		
		0.002			
7.51	0.203				

09/10/2020

4)

x	0	1	2	3	4	5	6	7	8	9	10
$f(x) = \frac{1}{1+x^2}$	1	0.5	0.2	0.1	0.0588235	0.03846 ~~0.0226244~~	0.027027	0.020000	0.0159846	0.0121951	0.009900

07/18/2020

TDPH 6th Semester Practical Examination-2020

SET-2

MATHEMATICS

Paper-VIII (2014 Syllabus)
Group-A (Numerical Analysis)

Full Marks: 40 | Time: 3 hours

[Practical = 30 | Viva Voce = 05 | Note Book = 05]

Answer any FIVE questions $6 \times 5 = 30$

1. Using suitable interpolation formula find the value of y at $x = 12$ from the following data, correct to 5 significant figures:-

x	10	14	18	22	26
y	1.00000	1.146128	1.255273	1.342427	1.414973

2. The angle of rotation θ (in radians) of a rod is given for various values of time 't' in seconds. Find the angular velocity and acceleration of the rod, when $t = 9$ seconds, correct to 4 significant figures.

t	1	3	5	7	9
θ	0.0000	1.0986	1.6094	1.9457	2.1972

3. A river is 80 ft wide. The depth 'd' in ft at a distance x ft from one bank is given by the following table:

x	0	10	20	30	40	50	60	70	80
d	0	4	7	9	12	13	14	8	3

Estimate the area of the cross section of the river.

4. Using Regula Falsi method find a real root of the equation $xe^x = \cos x$, correct to 4 significant figures.

5. Solve the following system of equations by Gauss elimination method:

$$8x_1 - 3x_2 + 2x_3 = 20$$
$$11x_2 - x_3 + 4x_1 = 33$$
$$12x_3 + 6x_1 + 3x_2 = 6$$

6. Find the inverse of the following matrix by Gauss-Jordan elimination method:

$$\begin{bmatrix} 2 & 3 & 1 \\ 5 & 0 & -2 \\ 0 & 4 & 3 \end{bmatrix}$$

1)

x	$f(x)$	$\Delta f(x)$
15		

Set-2

1)

x	y	Δy	$\Delta^2 y$	$\Delta^3 y$	$\Delta^4 y$
10	1.000000				
		0.146128			
14	1.146128		-0.036983		
		0.109145		0.014992	
18	1.255273		-0.021991		-0.007609
		0.087154		0.007383	
22	1.342427		-0.014608		
		0.072546			
26	1.414973				

$$v = \frac{x - x_0}{h} = \frac{12-10}{4} = 0.5$$

)

t	θ	$\Delta\theta$	$\Delta^2\theta$	$\Delta^3\theta$	$\Delta^4\theta$
1	0.0000				
		1.0986			
3	1.0986		-0.5878		
		0.5108		0.4135	
5	1.6094		-0.1743		-0.3236
		0.3365		0.0897	
7	1.9457		-0.0846		
		0.2515			
9	2.1972				

$$h = 2$$

$$v = \frac{t - t_n}{h} = 0$$

12/11/2020

07/10/2020

TDPH 6th Semester Practical Examination-2020

SET-3

MATHEMATICS

Paper-VIII (2014 Syllabus)
Group-A (Numerical Analysis)

Full Marks: 40 | Time: 3 hours

[Practical = 30 | Viva Voce = 05 | Note Book = 05]

Answer any FIVE questions $6 \times 5 = 30$

1. Calculate from the following table the value of y when $x = 102$. $= 1.5567398 43$

x	93.0	96.2	100.0	104.2	108.7
y	11.38	12.80	14.70	17.07	19.91

2. Solve the following system of equations by Gauss Jordon method:

$$2x_1 + 2x_2 + 4x_3 = 18$$
$$x_2 + 3x_3 + 2x_1 = 13$$
$$3x_3 + x_1 + 3x_2 = 14$$

3. Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 1.04$ for the function $y = f(x)$ given in the following table.

x	0.96	0.98	1.0	1.02	1.04
f	0.7825	0.7739	0.7651	0.7563	0.7473

4. Evaluate approximately, by Trapezoidal rule, the integral

$$\int_0^1 (4x - 3x^2)dx$$

by taking 10 intervals.

5. Find a real root of the equation $x^3 - x - 1 = 0$ correct to 3 places after decimal using Newton-Raphson method. 1.324

6. Evaluate $y(1.2)$ using Runge-Kutta method of order 2 (taking step length $h = 0.1$) for the initial value problem

$$\frac{dy}{dx} = x^2 + y^2, \quad y(1) = 0$$

Set 1

(3) x	0.96	0.98	1.00	1.02	1.04	
$f(x)$						

$v = 0$

x	$f(x)$	$\Delta f(x)$	$\Delta^2 f(x)$	$\Delta^3 f(x)$	$\Delta^4 f(x)$	
0.96	0.7825					
		-0.0086				
0.98	0.7739		-0.0002			
		-0.0088		0.0002		
1.00	0.7651		0.000		-0.0004	$v = 0$
		-0.0088		-0.0002		
1.02	0.7563		-0.0002			
		-0.0090				
1.04	0.7473					

$2n^2 - x^3$

①

07/10/2020

TDPH 6th Semester Practical Examination-2020

SET-4

MATHEMATICS

Paper-VIII (2014 Syllabus)
Group-A (Numerical Analysis)

Full Marks: 40 | Time: 3 hours

[Practical = 30 | Viva Voce = 05 | Note Book = 05]

Answer any **FIVE** questions $6 \times 5 = 30$

1. Calculate from the following table the value of y when $x = 1.6$

x	1.0	1.5	2.0	2.5	3.0
y	0.11246	0.14032	0.16800	0.19547	0.22270

1+2+2½+½

2. Find the inverse of the following matrix by Gauss elimination method:

$$\begin{bmatrix} 2 & 2 & 4 \\ 1 & 3 & 2 \\ 3 & 1 & 3 \end{bmatrix}$$

3. Calculate by Simpson's one-third rule the value of

$$\int_{1.2}^{1.6} \left(x + \frac{1}{x}\right) dx$$

correct upto 2 significant figures, taking 4 intervals.

4. Find a real root of the equation $x^3 - 4x - 9 = 0$ correct to 3 places after decimal using bisection method.

5. Solve the following system of equations by Gauss elimination method:

$$\begin{aligned} 2x_1 + 3x_2 + 2x_3 &= 2 \\ 10x_1 + 3x_2 + 4x_3 &= 16 \\ 3x_1 + 6x_2 + 2x_3 &= -6 \end{aligned}$$

6. Given the table of $y = \sinh x$ with spacing $h = 0.1$. Find the values of the derivatives y' y'' at the point $x = 0.0$

x	0.0	0.1	0.2	0.3	0.4	0.5
y	0.00000	0.10017	0.20134	0.30452	0.41075	0.52110

07/10/2020

TDPH 6th Semester Practical Examination-2020

SET-5

MATHEMATICS

Paper-VIII (2014 Syllabus)
Group-A (Numerical Analysis)

Full Marks: 40 | Time: 3 hours

[Practical = 30 | Viva Voce = 05 | Note Book = 05]

Answer any **FIVE** questions $6 \times 5 = 30$

1. Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 1.35$ for the function $y = f(x)$ given in the following table.

x	1.0	1.1	1.2	1.3	1.4
f	7.651	8.549	9.254	9.532	9.751

2. Evaluate $\int_0^2 \frac{dx}{1+x^2}$ by Weddle's rule on taking 12 sub-intervals.

3. Given

x	1	2	3	4	5	6
f	1	8	27	64	125	216

Find $f(1.7)$.

4. Find a real root of the equation $x^3 + x - 5 = 0$ correct to 3 places after decimal using Iteration method.

5. Find the inverse of the following matrix without finding its determinant

$$\begin{bmatrix} -2 & 4 & 8 \\ -4 & 18 & -16 \\ -6 & 2 & -20 \end{bmatrix}.$$

6. Apply Gauss-Seidal method to solve the equations

$$\begin{aligned} 2x - y + z &= 5 \\ x + 3y - 2z &= 7 \\ x + 2y + 3z &= 10. \end{aligned}$$

WC
A-Pal

SET-1

TDPH 6th Semester Practical Examination-2019

Mathematics

Paper-VIII (2014 Syllabus)
Group-A (Numerical Analysis)

Full Marks-40 | Time: 3 hours

[Numerical Analysis=30, Viva Voce=05, Note Book=05]

Answer any five questions:- 6x5=30

1) Using suitable interpolation formula, find the value of $f(2.1)$ $= 8.166163913$ from the following table, correct to four decimal places. $1\frac{1}{2} + 2 + 2 + \frac{1}{2}$

U=015

x	1.2	1.4	1.6	1.8	2.0
$f(x)$	3.32012	4.05520	4.95303	6.04965	7.38906

2) Find the area of the region bounded by x -axis, x =4, x =10 and $y = \log_{10}^{x}$, correct to four significant figures. 6·0896 $1\frac{1}{2} + 2 + 2 + \frac{1}{2}$

3) Find the smallest positive root of the equation$(1 + x^2)\tan x - 3x = 0$, correct to four significant figures, by iteration process. 0·98271236. $1 + 2 + 2\frac{1}{2} + \frac{1}{2}$

4) Solve the following system of equations, by Gauss – Seidel iteration method: 2+4.
$x + y - 3z = 6,$
$8x - y + z = 18,$
$2x + 5y - 2z = 3$
(2·32, -0·94, -1·54)

5) Find the inverse of the following matrix, by using Gauss-Elimination method: 2+4

$$\begin{bmatrix} 2 & -2 & 4 \\ 2 & 3 & 2 \\ -1 & 4 & -1 \end{bmatrix}^{-1} = \begin{bmatrix} -\frac{1}{2} & \frac{7}{11} & -\frac{8}{11} \\ 0 & 1/11 & 2/11 \\ 1/2 & -3/11 & 5/11 \end{bmatrix}$$

6) Evaluate $y(1.1) = 0.11072$, $y(1.2) = 0.24631$ *and* $y(1.3) = 0.41357$ using Runge-Kutta method of order 4 for the initial value problem: $\frac{dy}{dx} = x^2 + y^2,\ y(1) = 0$ 2+4

DJ-245

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SET-2

TDPH 6th Semester Practical Examination-2019

Mathematics

Paper-VIII (2014 Syllabus)
Group-A (Numerical Analysis)

Time: 3 hours

Full Marks-40

[Numerical Analysis=30, Viva Voce=05, Note Book=05]

Answer any five questions:- 6x5=30

1) Using suitable interpolation formula, find the value of $f(1.25)$ from the following table, correct to five significant figures. $= 3.4703414957$ $1\frac{1}{2}+2+2+\frac{1}{2}$

$h = 0.5$
$u = 0.5$

x	1.0	1.5	2.0	2.5	3.0	3.5
$f(x)$	2.71828	4.48169	7.38906	12.18249	20.08554	33.11545

2) Using suitable formula find the value of $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 0.45$ from the following table, correct to three decimal places. $=1.103$ $=0.467$ $(1+1)+2+(1+\frac{1}{2})+\frac{1}{2}$

$u = -0.5$

x	0.0	0.1	0.2	0.3	0.4	0.5
y	0.00000	0.10017	0.20134	0.30452	0.41075	0.52110

3) Find the smallest positive root of the equation: $x\tan x + 2x^2 = 2.5$ correct to four significant figures, by bisection method. $0.8652/9$ $2+1+2\frac{1}{2}+\frac{1}{2}$

4) Solve the following system of equations, by Gauss – Jordan method: $2+3+1.$

$2x_1 + 4x_2 + x_3 = 3,$
$3x_1 + 2x_2 - 2x_3 = -2,$ $(2, -1, 3)$
$x_1 - x_2 + x_3 = 6$

5) Find the inverse of the following matrix, by Gauss-Elimination method: $2+4.$

$$\begin{bmatrix} 2 & 2 & -3 \\ -3 & 2 & 2 \\ 2 & -3 & 2 \end{bmatrix}^{-1} = \frac{1}{5}\begin{bmatrix} 2 & 1 & 2 \\ 2 & 2 & 1 \\ 1 & 2 & 2 \end{bmatrix}$$

6) Use Runge-Kutta method of order two to find $y\,(0.2)$ and $y\,(0.4)$, given that $y\frac{dy}{dx} = y^2 - x$, $y(0) = 2$, by taking $h = 0.2$ $=2.4316$ $=2.87695$

$S.D = 385$

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SET-3

TDPH 6th Semester Practical Examination-2019

Mathematics

Paper-VIII (2014 Syllabus)
Group-A (Numerical Analysis)

Full Marks-40 | Time: 3 hours

[Numerical Analysis=30, Viva Voce=05, Note Book=05]

Answer any five questions:- 6x5=30

1) Using suitable interpolation formula, find the value of $f(1.5)$ from the following data, correct to five significant figures. $= 0.3978319$ $1\frac{1}{2}+2+2+\frac{1}{2}$

x	1	2	3	4	5	6
$f(x)$	0.0000	0.6931	1.0986	1.3863	1.6094	1.7918

2) Complete the value of x for $y = 0.6742$ from the following data, by using Newton's divided difference formula for inverse interpolation, correct to four significant figures: $= 4.723$ SAM-381 $1\frac{1}{2}+2+2+\frac{1}{2}$

x	3.5	4.0	4.8	5.6
y	0.5441	0.6020	0.6812	0.7482

3) The angle of rotation 'θ' (radians) of a rod is given for various values of the time 't' in seconds. Find the angular velocity and angular acceleration of the rod when t=1.2 seconds. Correct to three significant figures. $= 8.07$ r/sec $= 7.463$ r/sec² $(1+1)+1\frac{1}{2}+(1+1)+\frac{1}{2}$

t	0.0	0.4	0.8	1.2
θ	0.000	0.493	2.022	4.666

$1\frac{1}{2}+2+1\frac{1}{2}+\frac{1}{2}$

4) Using Simpson's $\frac{1}{3}$ rule evaluate $\int_0^{\pi/2} e^{\sin x}dx$, correct to four decimal places. $= 3.1043$ $1+1\frac{1}{2}+3+\frac{1}{2}$

5) Find a positive root of the equation: $xe^x = \cos x$, correct to 4 decimal places: 0.5778

6) Find the inverse of the following matrix by Gauss – Elimination method: $2+4$.

$$\begin{bmatrix} 2 & -2 & 4 \\ 2 & 3 & 2 \\ -1 & 4 & -1 \end{bmatrix}^{-1} = \begin{bmatrix} -\frac{1}{2} & 7/11 & -\frac{8}{11} \\ 0 & 1/11 & 2/11 \\ 1/2 & -2/11 & 5/11 \end{bmatrix}$$

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SET-4

TDPH 6th Semester Practical Examination-2019

Mathematics

Paper-VIII (2014 Syllabus)
Group-A (Numerical Analysis)

Full Marks-40 | Time: 3 hours

[Numerical Analysis=30, Viva Voce=05, Note Book=05]

Answer any five questions:- 6x5=30

2.56391072 $1\frac{1}{2}+4+\frac{1}{2}$

1) Using suitable interpolation formula, find the value of $f(6)$ correct to three decimal places. Given that $f(2) = 0.994177, f(5) = 2.308408, f(7) = 2.791008, f(10) = 3.302585, f(12) = 3.564088$

2) Find the real root of the equation: $2x - 3\,Cosx = 1.85$, by the method of inverse interpolation, correct to six significant figures. 1.31072 $1\frac{1}{2}+2\frac{1}{2}+1\frac{1}{2}+\frac{1}{2}$

SAM-383

3) Using Weddle's rule, calculate $\int_{0.5}^{0.7} \sqrt{x}\, e^{-x} dx$, correct to four significant figures. $1\frac{1}{2}+2\frac{1}{2}+1\frac{1}{2}+\frac{1}{2}$
$= 0.08483$

4) Solve the following system of equations by Gauss-Jordan's method: 2+4

$8x_1 - 3x_2 + 2x_3 = 20,$
$11x_2 - x_3 + 4x_1 = 33,$ (3,2,1)
$12x_3 + 6x_1 + 3x_2 = 36$

5) Find the inverse of the following matrix by Gauss – Elimination method: 2+4

$$\begin{bmatrix} 2 & 1 & 0 \\ 4 & 3 & 1 \\ 1 & 1 & 1 \end{bmatrix}^{-1} = \begin{bmatrix} 2 & -1 & 1 \\ -3 & 2 & -2 \\ 1 & -1 & 2 \end{bmatrix}$$

6) Evaluate $y(1.1)$, $y(1.2)$ and $y(1.3)$ using Runge-Kutta method of order four for the initial value problem: $\frac{dy}{dx} = x^2 + y^2,\ y(1) = 0$ 2+4

$= 0.11072$ $= 0.24631$ $= 0.41357$

BJ-265

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$$\int_{x_0}^{x_n} y\,dx = \frac{3h}{10}\Big[(y_0+y_n) + 5(y_1+y_5+y_7+y_{11}+\cdots+y_{n-5}+y_{n-1})$$
$$+ (y_2+y_4+y_8+y_{10}+\cdots+y_{n-4}+y_{n-2})$$
$$+ 6(y_3+y_9+y_{15}+\cdots+y_{n-3})$$
$$+ 2(y_6+y_{12}+\cdots+y_{n-6})\Big].$$

SET-5

TDPH 6th Semester Practical Examination-2019

Mathematics

Paper-VIII (2014 Syllabus)
Group-A (Numerical Analysis)

Full Marks-40 | Time: 3 hours

[Numerical Analysis=30, Viva Voce=05, Note Book=05]

Answer any five questions:- 6x5=30

1) Using suitable interpolation formula, find the value of $f(12)$ from the following table, correct to four decimal places. $=1.079181246$ $1\frac{1}{2}+2+2+\frac{1}{2}$

U=0.5

x	3	5	7	9	11
$f(x)$	0.47712	0.69897	0.84510	0.95424	1.04139

2) Using suitable formulae find the value of $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 0.05$ from the following table. $=0.99994$ $\rightarrow 0.08975$ $(1+1)+2+(1+\frac{1}{2})+\frac{1}{2}$

U=+0.5

x	0.0	0.1	0.2	0.3	0.4	0.5
y	0.00000	0.10007	0.20134	0.30452	0.41075	0.52110

3) Evaluate $\int_0^{\pi/2} \sqrt{Sinx}\, dx$, correct to five significant figures, by Trapezodial rule. $=1.185199702$ $1+2\frac{1}{2}+2+\frac{1}{2}$

4) Find a real root of the equation $log_e x = Cosx$, correct to five decimal places, by Newton-Raphson method. 1.30296. $2+3\frac{1}{2}+\frac{1}{2}$

5) Solve the following system of equations by Gauss-Elimination method:

$3x + 4y + 2z = 1,$ $(1, -2, 3)$ $2+4$

$2y + z + 5x = 4,$

$2z + 2x + 3y = 2$

6) Find the inverse of the following matrix by Gauss – Jordon method: $2+4$

$$\begin{bmatrix} 2 & 2 & 4 \\ 1 & 3 & 2 \\ 3 & 1 & 3 \end{bmatrix}^{-1} = \begin{bmatrix} -7/12 & 1/6 & 2/3 \\ -1/4 & 1/2 & 0 \\ 2/3 & -1/3 & -1/3 \end{bmatrix}$$

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SET-6

TDPH 6th Semester Practical Examination-2019

Mathematics

Paper-VIII (2014 Syllabus)
Group-A (Numerical Analysis)

Full Marks-40 | Time: 3 hours

[Numerical Analysis=30, Viva Voce=05, Note Book=05]

Answer any five questions:- 6x5=30

$= 1.0136.$ $1\frac{1}{2} + 4 + \frac{1}{2}$

1) Using suitable interpolation formula, find the value of $f(6)$ correct to five significant figures. Given $f(3) = 0.62149,\ f(5) = 0.91047,\ f(8) = 1.17635,\ f(10) = 1.30259,\ f(12) = 1.40573$

$1\frac{1}{2} + 2\frac{1}{2} + 1\frac{1}{2} + \frac{1}{2}$

2) The population of a town is given below: $1.6691.$

Year	1971	1981	1991	2001	2011
Population (in thousand)	19.96	39.65	58.81	77.21	94.61

Estimate the rate of growth of population in 2010.

3) Find a real root of the equation: ~~1.2204~~ $0.1224.$ $1 + 2 + 2\frac{1}{2} + \frac{1}{2}$
$100x = 21\ Sin\ (x + 0.5)$, correct to four decimal places, by Iteration Process

4) Solve the following system of equations by Gauss-Seidal iteration method:
$9x_1 - 3x_2 + 2x_3 = 23,$ $(3, 2, 1)$ $2 + 4$
$6x_1 + 3x_2 + 14x_3 = 38,$
$4x_1 + 12x_2 - x_3 = 35$

5) Find the inverse of the following matrix by Gauss – Jordon method: $2 + 4$

$$\begin{bmatrix} 2 & 1 & 0 \\ 4 & 3 & 1 \\ 1 & 1 & 1 \end{bmatrix}^{-1} = \begin{pmatrix} 2 & -1 & 1 \\ -3 & 2 & -2 \\ 1 & -1 & 2 \end{pmatrix}$$

6) Use Runge-Kutta method of order two to find $y\ (0.2)$ *and* $y\ (0.4)$ *given that* $y\frac{dy}{dx} = y^2 - x,$
$y(0) = 2$, by taking h=0.2 2.43166 2.37698

**** $2 + 4$

SET-7

TDPH 6th Semester Practical Examination-2019

Mathematics

Paper-VIII (2014 Syllabus)
Group-A (Numerical Analysis)

Time: 3 hours

Full Marks-40

[Numerical Analysis=30, Viva Voce=05, Note Book=05]

6x5=30

Answer any five questions:-

1) Compute the value of x for $y = 1.686479$, correct to three significant figures, from the following table:

x	0.48	0.52	0.61	0.63
y	1.616074	1.682028	1.840431	1.877610

2) Find a real root of the equation: $2x - 3\,Cosx = 1.85$, correct to five significant figures.

3) The angle of rotation 'θ' (radians) of a rod is given for various values of the time 't' in seconds. Find the angular velocity and angular acceleration of the rod when t=1.2 seconds.

t	0.0	0.4	0.8	1.2
θ	0.000	0.493	2.022	4.666

4) Using Weddle's rule, calculate $\int_{0.5}^{0.7} \sqrt{x}\, e^{-x} dx$, correct to four significant figures.

5) Solve the following system of equation by Gauss-Jordan method:

$$8x_1 - 3x_2 + 2x_3 = 20,$$
$$11x_2 - x_3 + 4x_1 = 33,$$
$$12x_3 + 6x_1 + 3x_2 = 36$$

6) Find the inverse of the following matrix by Gauss – Elimination method:

$$\begin{bmatrix} 2 & 3 & -1 \\ 4 & 4 & -3 \\ 2 & -3 & 1 \end{bmatrix}$$

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1+1+1+1+1+1

TDPH 6th Semester Practical Examination , 2018

Mathematics , Paper VIII,(2014- Syllabus)

Group – A

Full marks ~~50~~ 40, Time 3 hours

The figures in the margin indicate full marks.

Answer any five questions.

[Numerical Analysis=~~40~~ 30 + Viva-voce=05 + practical note book=05;Total =~~50~~ 40]

Set – I

(5X~~8~~ 6 =~~40~~ 30)

1. The area A of a circle of diameter d is given for the following values : 1+2+3

8666

d	80	85	90	95	100
A	5026	5674	6362	7088	7854

Calculate the area of a circle of diameter 105.

2. Find $\frac{dy}{dx}$ $and \frac{d^2y}{dx^2}$ at x=1.35 up to four significant figures from the following table: (1+1) + 2+2

1.786

30.06

x	1.0	1.1	1.2	1.3	1.4
y	7.651	8.549	9.254	9.532	9.751

3. Evaluate $\int_0^2 \frac{dx}{1+x^2}$, by using weddle's rule,taking 12 intervals, 4 decimal places. 1.1701 1+2+3

4. Find a real root of the equation 2x –logx - 6=0, using Regula-falsi method correct to three decimal places. 3.256 2+4

5. Find the inverse of the Matrix $\begin{pmatrix} -2 & 4 & 8 \\ -4 & 18 & -16 \\ -6 & 2 & -20 \end{pmatrix}$ $\begin{pmatrix} -\frac{41}{190} & \frac{6}{95} & -\frac{13}{95} \\ 1/95 & \frac{11}{190} & -4/95 \\ 5/76 & -1/76 & -1/76 \end{pmatrix}$ 2+4

without finding its determinant.

6. using Runge-Kutta method of order 4, compute y(.2) from 10dy/dx =x^2 +y^2 , y(0)=1 taking h= 0.1 2+4

1.0206 7756 2.

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1+1+1+1+1+1+1

TDPH 6th Semester Practical Examination , 2018

Mathematics , Paper VIII,(2014- Syllabus)

Group – A

40

Full marks ~~50~~, Time 3 hours

The figures in the margin indicate full marks.

30 Answer any five questions. 40

[Numerical Analysis=~~40~~ + Viva-voce=05 + practical note book=05;Total =~~50~~]

Set – IV

6 30

(5X~~8~~ =~~40~~)

1. Find the value of Cos 1.825 using the values given in the table below:

x	1.70	1.74	1.78	1.82	1.86
sinx	0.9916	0.9857	0.9781	0.9691	0.9584

−0.251368

~~2. Find the Newton –Raphson method, the real root of the equation 3x= cosx + 1~~

2. Find the 1st and 2nd derivative of f(x) at x=1. 5 from the following table:

X	1.5	2.0	2.5	3.0	3.5	4.0
f(x)	3.375	7.000	13.625	24.000	38.375	59.000

$y' = 6$, $y'' = -1.16667$

3. Using Newton-Raphson method, find the real root of x $\log_{10}$x =1.2 correct to five decimal places.

$x = 2.74064$

4. Find the inverse of the matrix $\begin{pmatrix} 3 & 2 & 4 \\ 2 & 1 & 1 \\ 1 & 3 & 5 \end{pmatrix}$ without finding its determinant.

$\begin{pmatrix} 1/4 & 1/4 & -1/4 \\ -7/8 & 11/8 & 5/8 \\ 5/8 & -7/8 & -1/8 \end{pmatrix}$

5. Apply Gauss-Jordan method to solve the equations

$x + y + z = 9$

$2x - 3y + 4z = 13$

$3x + 4y + 5z = 40$, Using diagonal matrix form.

(1, 3, 5)

6. Find the inverse of the matrix $\begin{pmatrix} 2 & -2 & 4 \\ 2 & 3 & 2 \\ -1 & 1 & -1 \end{pmatrix}$ without finding its determinant.

$\begin{pmatrix} -1/2, & 1/5, & -8/5 \\ 0 & 1/5 & 2/5 \\ 1/2 & 0, & 1 \end{pmatrix}$

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TDPH 6th Semester Practical Examination , 2018

Mathematics , Paper VIII,(2014- Syllabus)

Group – A

Full marks ~~50~~ 40, Time 3 hours

The figures in the margin indicate full marks.

Answer any five questions.

[Numerical Analysis=~~40~~ 30 + Viva-voce=05 + practical note book=05;Total =~~50~~ 40]

Set – VIII

(5X~~8~~ 6 =~~40~~ 30)

1. Find the distance moved by a particle and its acceleration at the end of 4 seconds,if the time verses velocity data is as follows:

t =	0	1	3	4
v =	21	15	12	10

2. Find first derivative of f(x) at x= 0.1 & x= 0.3 where f(x) is given by

X	1.0	1.1	1.2	1.3	1.4	1.5	1.6
f(x)	7.989	8.403	8.781	9.129	9.451	9.750	10.031

3. Evalute *the integral* $\int_1^2 \frac{e^{2x}}{1+x^2}$ dx , using Trapzoidal rule with 6 intervals(ie h=0.2).

4. Evaluate $30^{-1/5}$ correct to four decimal places by Newton-Raphson method

5. Solve $x_1 + x_2 + x_3 = 1$

$3x_1 + x_2 - 3x_3 = 5$

$X_1 - 2x_2 - 5x_3 = 10$. By Gauss-Jardan method. [Use diagonal matrix form]

6. . Apply Runge-Kutta methodof fourth order to find an approximate value of y for x=0.2 given that $dy/dx = x + y^2$ and y =1 where x =0.