KHARAGPUR COLLEGE

DEPARTMENT OF MATHEMATICS

CERTIFICATE COURSE ON "ADVANCEMENT OF MATHEMATICS FOR UG LEVEL"

ATTENDANCE SHEET

				Date-24/05/2023	26/05/2023
1	Akash Pal	2nd	2218002	Akash pal	Akash pal
2	Amal Patra	4th	2118004	Amal Patra	Amal Patra
3	Argha Samanta	2nd	220119	Argha Samanta	Argha Samanta
4	Asha Rani Ganjan	4th	2118001	Asha Rani Ganjan	Asha Rani Ganjan
5	Ashima Dey	6th	2022018	Ashima Dey	Ashima Dey
6	Ayan Roy	4th	2118013	Ayan Roy	Ayan Roy
7	Biswajit Bhunia	4th	2118016	Biswajit Bhunia.	Biswajit Bhunia.
8	Debanjan Rana	2nd	2218013	Debanjan Rana	Debanjan Rana
9	Devipriya Dey	6th	2022025	Devipriya Dey.	Devipriya Dey.
10	Dipesh Bhattacharya	2nd	2218014	Dipesh Bhattacharya	Dipesh Bhattacharya
11	Dipti Patra	2nd	2218093	Dipti Patra	Dipti Patra
12	Gouranga Bag	2nd	2218016	Gouranga Bag	Gouranga Bag
13	Gourav Samanta	4th	2118021	Gour Sant.	Gourav Samanta
14	Jitendra Kar	2nd	2218021	Jitendra Kar	Jitendra Kar
15	Jyotirmoy Dey	6th	2030005	Jyotirmoy Dey	
16	Krishnendu Dinda	2nd	2218027	Krishnendu Dinda	Krishnendu Dinda
17	Mahadeb Saren	4th	2118031	Mahadeb Saren	Mahadeb Saren
18	Manoj Rana	4th	2118033	Manoj Rana	Manoj Rana
19	Milan Manna	2nd	2218031	Milan Manna	
20	Monalisha Pradhan	2nd	2318033	Monalisha Pradhan	Monalisha Pradhan
21	Oindrila Sharangi	2nd	2218035	Oindrila Sharangi	Oindrila Sharangi
22	Palash Das	6th	2022037	Palash Das	Palash Das
23	Prabhat Kuila	2nd	220138	Prabhat kuila	Prabhat kuila

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27/05/2023	29/05/2023	30/05/2023	31/05/2023
Akash pal	Akash pal	Akash pal	Akash pal
Amal Patra	Amal Patra	Amal Patra	Amal Patra
Argha Samanta	Argha Samanta	Argha Samanta	Argha Samanta
Asha Rani Ganjan	Asha Rani Ganjan	Asha Rani Ganjan	Asha Rani Ganjan
Ashima Dey	Ashima Dey	Ashima Dey	Ashima Dey
Ayan Roy	Ayan Roy	Ayan Roy	Ayan Roy
Biswajit Bhunia.	Biswajit Bhunia.	Biswajit Bhunia.	Biswajit Bhunia.
Debanjan Rana	Debanjan Rana	Debanjan Rana	Debanjan Rana
Devipriya Dey.	Devipriya Dey.	Devipriya Dey.	Devipriya Dey.
Dipesh Bhattacharya	Dipesh Bhattacharya	Dipesh Bhattacharya	Dipesh Bhattacharya
Dipti Patra	Dipti Patra	Dipti Patra	Dipti Patra
Gouranga Bag	Gouranga Bag	Gouranga Bag	Gouranga Bag
Gourav Sant.	Gourav Samanta	Gourav Samanta	Gourav Samanta
Jitendra Kar	Jitendra Kar	Jitendra Kar	Jitendra Kar
	Jyotirmoy Dey		Jyotirmoy Dey
Krishnendu Dinda	Krishnendu Dinda	Krishnendu Dinda	Krishnendu Dinda
Mahadeb Saren	Mahadeb Saren	Mahadeb Saren	Mahadeb Saren
Manoj Rana	Manoj Rana	Manoj Rana	Manoj Rana
Milan Manna		Milan Manna	
Monalisha Pradhan	Monalisha Pradhan	Monalisha Pradhan	Monalisha Pradhan
Oindrila Sharangi	Oindrila Sharangi	Oindrila Sharangi	Oindrila Sharangi
Palash Das	Palash Das	Palash Das	Palash Das
Prabhat Kuila	Prabhat Kuila	Prabhat Kuila	Prabhat Kuila

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ATTENDANCE SHEET

				24/05/23	26/05/23	27/05/23	29/05/23	30/05/23	31/05/23
24	Pratasna Ghosh	2nd	2218038	Pratasna Ghosh	Pratasna Ghosh	Pratasna Ghosh	Pratasna Ghosh	Pratasna Ghosh	Pratasna Ghosh
25	Pritam Patra	2nd	2218039	Pritam Patra	Pritam Patra	Pritam Patra	Pritam Patra	Pritam Patra	Pritam Patra
26	Rahul Das	4th	2118044	Rahul Das	Rahul Das	Rahul Das	Rahul Das	Rahul Das	Rahul Das
27	Rahul Ganjan	4th	2118046	Rahul Ganjan	Rahul Ganjan	Rahul Ganjan	Rahul Ganjan	Rahul Ganjan	Rahul Ganjan
28	Rajib Das	4th	2111052	Rajib Das	Rajib Das	Rajib Das	Rajib Das	Rajib Das	Rajib Das
29	Rajkumar Patra	6th	2022043	Rajkumar Patra	Rajkumar Patra	Rajkumar Patra	Rajkumar Patra	Rajkumar Patra	Rajkumar Patra
30	Riju Pramanik	4th	2118057	Riju Pramanik	Riju Pramanik	Riju Pramanik	Riju Pramanik	Riju Pramanik	Riju Pramanik
31	Sagar Pratihar	6th	2022048	Sagar Pratihar	Sagar Pratihar	Sagar Pratihar	Sagar Pratihar	Sagar Pratihar	Sagar Pratihar
32	Sandipan Singha	2nd	2218055	Sandipan Singha	Sandipan Singha	Sandipan Singha	Sandipan Singha	Sandipan Singha	Sandipan Singha
33	Sanjib Bhunia	6th	2022053	Sanjib Bhunia		Sanjib Bhunia		Sanjib Bhunia	Sanjib Bhunia
34	Santanu Mondal	2nd	2218057	Santanu Mondal	Santanu Mondal	Santanu Mondal	Santanu Mondal	Santanu Mondal	Santanu Mondal
35	Sayan Bhattacharya	6th	2022095	Sayan Bhattacharya	2022 Sayan Bhatta-charya	Sayan Bhattacharya	Sayan Bhattacharya	Sayan Bhattacharya	Sayan Bhattacharya
36	Sayan Dey	4th	2118069	Sayan Dey	Sayan Dey	Sayan Dey	Sayan Dey	Sayan Dey	Sayan Dey
37	Sayan Mahapatra	2nd	2218059		Sayan Mahapatra		Sayan Mahapatra		Sayan Mahapatra
38	Sayani Mahapatra	2nd	2218060	Sayani Mahapatra	Sayani Mahapatra	Sayani Mahapatra	Sayani Mahapatra	Sayani Mahapatra	Sayani Mahapatra
39	Shibangsu Bisai	4th	2118073	Shibangsu Bisai	Shibangsu Bisai	Shibangsu Bisai	Shibangsu Bisai	Shibangsu Bisai	Shibangsu Bisai
40	Shreya Nandi	2nd	2218061	Shreya Nandi	Shreya Nandi	Shreya Nandi	Shreya Nandi	Shreya Nandi	Shreya Nandi
41	Siuli Sau	2nd	2218062	Siuli Sau	Siuli Sau	Siuli Sau	Siuli Sau	Siuli Sau	Siuli Sau
42	Somnath Palai	4th	2118078	Somnath Palai	Somnath Palai	Somnath Palai	Somnath Palai	Somnath Palai	Somnath Palai
43	Sourav Khatua	4th	2118102	Sourav Khatua	Sourav Khatua	Sourav Khatua	Sourav Khatua	Sourav Khatua	Sourav Khatua
44	Souvik Chakraborty	6th	2022074	Souvik chakraborty	Souvik chakraborty	Souvik chakraborty	Souvik chakraborty	Souvik chakraborty	Souvik chakraborty
45	Souvik Das	2nd	2218070	Souvik Das			Souvik Das		Souvik Das
46	Subhadip Dey	2nd		Subhadip Dey	Subhadip Dey	Subhadip Dey	Subhadip Dey	Subhadip Dey	Subhadip Dey
47	Subhadip Ghosh	6th	2030024	Subhadip Ghosh		Subhadip Ghosh		Subhadip Ghosh	

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				24/05/23	26/05/23
48	Subhajit Bera	2nd	2218075	Subhajit Bera	Subhajit Bera
49	Subhajit Mahata	4th	2118085	Subhajit Mahata	Subhajit Mahata
50	Subhajit Ojha	2nd	2218076	Subhajit Ojha	Subhajit Ojha
51	Subham Bhunia	2nd	2218078	Subham Bhunia	Subham Bhunia
52	Subhankar Pradhan	4th	2118086	Subhankar Pradhan	Subhankar Pradhan
53	Subhrajit Majhi	6th	2022079	Subhrajit Majhi	Subhrajit Majhi
54	Subrata Sahoo	2nd	2218080	Subrata Sahoo	Subrata Sahoo
55	Sudip Bhanja	4th	2118088	Sudip Bhanja	Sudip Bhanja
56	Sudipta Bhunia	6th	2022082	Sudipta Bhunia	
57	Sudipta Hembram	2nd	2218082	Sudipta Hembram	Sudipta Hembram
58	Suman Ghosh	6th	2022084	Suman Ghosh	Suman Ghosh
59	Sumandeep Patra	2nd	2218094	Sumandeep Patra	Sumandeep Patra
60	Sunit Jana	4th	2118093	Sunit Jana	Sunit Jana
61	Suprabhat Bera	6th	2022088	Suprabhat Bera	
62	Surajit Bera	4th	2118094	Surajit Bera	Surajit Bera
63	Surajit Patra	4th	2118096	Surajit Patra	Surajit Patra
64	Tamasa Chowdhury	4th	2118103	Tamasa Chowdhury	Tamasa Chowdhury
65	Tuhin Das	2nd	220166	Tuhin Das	Tuhin Das
66	Ujjal Gope	2nd	2218090	Ujjal Gope	Ujjal Gope
67	Upen Mandi	2nd	2218091	Upen Mandi	

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ATTENDANCE SHEET

27/05/23	29/05/23	30/05/23	31/05/23.
Subhajit Bera	Subhajit Bera	Subhajit Bera	Subhajit Bera
Subhajit Mahata	Subhajit Mahata	Subhajit Mahata	Subhajit Mahata
Subhajit Ojha	Subhajit Ojha	Subhajit Ojha	Subhajit Ojha
Subham Bhunia	Subham Bhunia	Subham Bhunia	Subham Bhunia
Subhankar Pradhan	Subhankar Pradhan	Subhankar Pradhan	Subhankar Pradhan
Subhrajit Majhi	Subhrajit Majhi	Subhrajit Majhi	Subhrajit Majhi
Subrata Sahoo	Subrata Sahoo	Subrata Sahoo	Subrata Sahoo
Sudip Bhanja	Sudip Bhanja	Sudip Bhanja	Sudip Bhanja
	Sudipta Bhunia		Sudipta Bhunia
Sudipta Hembram	Sudipta Hembram	Sudipta Hembram	Sudipta Hembram
	Suman Ghosh		Suman Ghosh
Sumandeep Patra	Sumandeep Patra	Sumandeep Patra	Sumandeep Patra
Sunit Jana	Sunit Jana	Sunit Jana	Sunit Jana
	Suprabhat Bera		Suprabhat Bera
Surajit Bera	Surajit Bera	Surajit Bera	Surajit Bera
Surajit Patra	Surajit Patra	Surajit Patra	Surajit Patra
Tamasa Chowdhury	Tamasa Chowdhury	Tamasa Chowdhury	Tamasa Chowdhury
Tuhin Das	Tuhin Das	Tuhin Das	Tuhin Das
Ujjal Gope	Ujjal Gope	Ujjal Gope	Ujjal Gope
	Upen Mandi		Upen Mandi

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ATTENDANCE SHEET

				~~24/05~~ 01/06/23	02/06/23
1	Akash Pal	2nd	2218002	Akash pal	Akash pal
2	Amal Patra	4th	2118004	Amal Patra	Amal Patra
3	Argha Samanta	2nd	220119	Argha Samanta	Argha Samanta
4	Asha Rani Ganjan	4th	2118001	Asha Rani Ganjan	Asha Rani Ganjan
5	Ashima Dey	6th	2022018	Ashima Dey	Ashima Dey
6	Ayan Roy	4th	2118013	Ayan Roy	Ayan Roy
7	Biswajit Bhunia	4th	2118016	Biswajit Bhunia.	Biswajit Bhunia.
8	Debanjan Rana	2nd	2218013	Debanjan Rana	Debanjan Rana
9	Devipriya Dey	6th	2022025	Devipriya Dey	Devipriya Dey
10	Dipesh Bhattacharya	2nd	2218014	Dipesh Bhattacharya	Dipesh Bhattacharya
11	Dipti Patra	2nd	2218093	Dipti Patra	Dipti Patra
12	Gouranga Bag	2nd	2218016	Gouranga Bag	Gouranga Bag
13	Gourav Samanta	4th	2118021	Gourav Samanta.	Gourav Samanta
14	Jitendra Kar	2nd	2218021	Jitendra Kar	Jitendra Kar
15	Jyotirmoy Dey	6th	2030005	Jyotirmoy Dey	
16	Krishnendu Dinda	2nd	2218027	Krishnendu Dinda	Krishnendu Dinda
17	Mahadeb Saren	4th	2118031	Mahadeb Saren	Mahadeb Saren
18	Manoj Rana	4th	2118033	Manoj Rana	Manoj Rana
19	Milan Manna	2nd	2218031	Milan Manna	
20	Monalisha Pradhan	2nd	2318033	Monalisha Pradhan	Monalisha Pradhan
21	Oindrila Sharangi	2nd	2218035	Oindrila Sharangi	Oindrila Sharangi
22	Palash Das	6th	2022037	Palash Das	Palash Das
23	Prabhat Kuila	2nd	220138	Prabhat Kuila	Prabhat Kuila

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05/06/23	06/06/23	07/06/23	08/06/23
Akash pal	Akash pal	Akash pal	Akash pal
Amal Patra	Amal Patra	Amal Patra	Amal Patra
Argha Samanta	Argha Samanta	Argha Samanta	Argha Samanta
Asha Rani Ganjan	Asha Rani Ganjan	Asha Rani Ganjan	Asha Rani Ganjan
Ashima Dey	Ashima Dey	Ashima Dey	Ashima Dey
Ayan Roy	Ayan Roy	Ayan Roy	Ayan Roy
Biswajit Bhunia.	Biswajit Bhunia.	Biswajit Bhunia.	Biswajit Bhunia.
Debanjan Rana	Debanjan Rana	Debanjan Rana	Debanjan Rana
Devipriya Dey	Devipriya Dey	Devipriya Dey	Devipriya Dey
Dipesh Bhattacharya	Dipesh Bhattacharya	Dipesh Bhattacharya	Dipesh Bhattacharya
Dipti Patra	Dipti Patra	Dipti Patra	Dipti Patra
Gouranga Bag	Gouranga Bag	Gouranga Bag	Gouranga Bag
Gourav Samanta	Gourav Samanta	Gourav Samanta	Gourav Samanta
Jitendra Kar	Jitendra Kar	Jitendra Kar	Jitendra Kar
	Jyotirmoy Dey		Jyotirmoy Dey
Krishnendu Dinda	Krishnendu Dinda	Krishnendu Dinda	Krishnendu Dinda
Mahadeb Saren	Mahadeb Saren	Mahadeb Saren	Mahadeb Saren
Manoj Rana	Manoj Rana	Manoj Rana	Manoj Rana
	Milan Manna		Milan Manna
Monalisha Pradhan	Monalisha Pradhan	Monalisha Pradhan	Monalisha Pradhan
Oindrila Sharangi	Oindrila Sharangi	Oindrila Sharangi	Oindrila Sharangi
Palash Das	Palash Das	Palash Das	Palash Das
Prabhat Kuila	Prabhat Kuila	Prabhat Kuila	Prabhat Kuila

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				01/06/23	02/06/23
24	Pratasna Ghosh	2nd	2218038	Pratasna Ghosh	Pratasna Ghosh
25	Pritam Patra	2nd	2218039	Pritam Patra	Pritam Patra
26	Rahul Das	4th	2118044	Rahul Das	Rahul Das
27	Rahul Ganjan	4th	2118046	Rahul Ganjan	Rahul Ganjan
28	Rajib Das	4th	2111052	Rajib Dey	Rajib Dey
29	Rajkumar Patra	6th	2022043	Rajkumar Patra	Rajkumar Patra
30	Riju Pramanik	4th	2118057	Riju Pramanik	Riju Pramanik
31	Sagar Pratihar	6th	2022048	Sagar Pratihar	Sagar Pratihar
32	Sandipan Singha	2nd	2218055	Sandipan Singha	Sandipan Singha
33	Sanjib Bhunia	6th	2022053		Sanjib Bhunia
34	Santanu Mondal	2nd	2218057	Santanu Mondal	Santanu Mondal
35	Sayan Bhattacharya	6th	2022095	Sayan Bhattacharya	Sayan Bhattacharya
36	Sayan Dey	4th	2118069	Sayan Dey	Sayan Dey
37	Sayan Mahapatra	2nd	2218059		Sayan Mahapatra
38	Sayani Mahapatra	2nd	2218060	Sayani Mahapatra	Sayani Mahapatra
39	Shibangsu Bisai	4th	2118073	Shibangsu Bisai	Shibangsu Bisai
40	Shreya Nandi	2nd	2218061	Shreya Nandi	Shreya Nandi
41	Siuli Sau	2nd	2218062	Siuli Sau	Siuli Sau
42	Somnath Palai	4th	2118078	Somnath Palai	Somnath Palai
43	Sourav Khatua	4th	2118102	Sourav Khatua	Sourav Khatua
44	Souvik Chakraborty	6th	2022074	Souvik Chakraborty	Souvik Chakraborty
45	Souvik Das	2nd	2218070	Souvik Das	
46	Subhadip Dey	2nd		Subhadip Dey	Subhadip Dey
47	Subhadip Ghosh	6th	2030024	Subhadip Ghosh	

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ATTENDANCE SHEET

				05/06/23	06/06/23	07/06/23	08/06/23
24	Pratasna Ghosh	2nd	2218038	Pratasna Ghosh	Pratasna Ghosh	Pratasna Ghosh	Pratasna Ghosh
25	Pritam Patra	2nd	2218039	Pritam Patra	Pritam Patra	Pritam Patra	Pritam Patra
26	Rahul Das	4th	2118044	Rahul Das	Rahul Das	Rahul Das	Rahul Das
27	Rahul Ganjan	4th	2118046	Rahul Ganjan	Rahul Ganjan	Rahul Ganjan	Rahul Ganjan
28	Rajib Das	4th	2111052	Rajib Dey	Rajib Dey	Rajib Dey	Rajib Dey
29	Rajkumar Patra	6th	2022043	Rajkumar Patra	Rajkumar Patra	Rajkumar Patra	Rajkumar Patra
30	Riju Pramanik	4th	2118057	Riju Pramanik	Riju Pramanik	Riju Pramanik	Riju Pramanik
31	Sagar Pratihar	6th	2022048	Sagar Pratihar	Sagar Pratihar	Sagar Pratihar	Sagar Pratihar
32	Sandipan Singha	2nd	2218055	Sandipan Singha	Sandipan Singha	Sandipan Singha	Sandipan Singha
33	Sanjib Bhunia	6th	2022053		Sanjib Bhunia		Sanjib Bhunia
34	Santanu Mondal	2nd	2218057	Santanu Mondal	Santanu Mondal	Santanu Mondal	Santanu Mondal
35	Sayan Bhattacharya	6th	2022095	Sayan Bhattacharya	Sayan Bhattacharya	Sayan Bhattacharya	Sayan Bhattacharya
36	Sayan Dey	4th	2118069	Sayan Dey	Sayan Dey	Sayan Dey	Sayan Dey
37	Sayan Mahapatra	2nd	2218059		Sayan Mahapatra		Sayan Mahapatra
38	Sayani Mahapatra	2nd	2218060	Sayani Mahapatra	Sayani Mahapatra	Sayani Mahapatra	Sayani Mahapatra
39	Shibangsu Bisai	4th	2118073	Shibangsu Bisai	Shibangsu Bisai	Shibangsu Bisai	Shibangsu Bisai
40	Shreya Nandi	2nd	2218061		Shreya Nandi	Shreya Nandi	Shreya Nandi
41	Siuli Sau	2nd	2218062	Siuli Sau	Siuli Sau	Siuli Sau	Siuli Sau
42	Somnath Palai	4th	2118078	Somnath Palai	Somnath Palai	Somnath Palai	Somnath Palai
43	Sourav Khatua	4th	2118102	Sourav Khatua	Sourav Khatua	Sourav Khatua	Sourav Khatua
44	Souvik Chakraborty	6th	2022074	Souvik Chakraborty	Souvik Chakraborty	Souvik Chakraborty	Souvik Chakraborty
45	Souvik Das	2nd	2218070	Souvik Das		Souvik Das	
46	Subhadip Dey	2nd		Subhadip Dey	Subhadip Dey	Subhadip Dey	Subhadip Dey
47	Subhadip Ghosh	6th	2030024		Subhadip Ghosh		Subhadip Ghosh

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				01/06/23	02/06/23
48	Subhajit Bera	2nd	2218075	Subhajit Bera	Subhajit Bera
49	Subhajit Mahata	4th	2118085	Subhajit Mahata	Subhajit Mahata
50	Subhajit Ojha	2nd	2218076	Subhajit Ojha	Subhajit Ojha
51	Subham Bhunia	2nd	2218078	Subham Bhunia	Subham Bhunia
52	Subhankar Pradhan	4th	2118086	Subhankar pradhan	Subhankar pradhan
53	Subhrajit Majhi	6th	2022079	Subhrajit Majhi	Subhrajit Majhi
54	Subrata Sahoo	2nd	2218080	Subrata Sahoo	Subrata Sahoo
55	Sudip Bhanja	4th	2118088	Sudip Bhanja	Sudip Bhanja
56	Sudipta Bhunia	6th	2022082	Sudipta Bhunia	
57	Sudipta Hembram	2nd	2218082	Sudipta Hembram	Sudipta Hembram
58	Suman Ghosh	6th	2022084	Suman Ghosh	
59	Sumandeep Patra	2nd	2218094	Sumandeep Patra	Sumandeep Patra
60	Sunit Jana	4th	2118093	Sunit Jana	Sunit Jana
61	Suprabhat Bera	6th	2022088	Suprabhat Bera	
62	Surajit Bera	4th	2118094	Surajit Bera	Surajit Bera
63	Surajit Patra	4th	2118096	Surajit Patra	Surajit Patra
64	Tamasa Chowdhury	4th	2118103	Tamasa Chowdhury	Tamasa Chowdhury
65	Tuhin Das	2nd	220166	Tuhin Das	Tuhin Das
66	Ujjal Gope	2nd	2218090	Ujjal Gope	Ujjal Gope
67	Upen Mandi	2nd	2218091		Upen Mandi

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05/06/23	06/06/23	07/06/23	08/06/23
Subhajit Bera	Subhajit Bera	Subhajit Bera	Subhajit Bera
Subhajit Mahata	Subhajit Mahata	Subhajit Mahata	Subhajit Mahata
Subhajit Ojha	Subhajit Ojha	Subhajit Ojha	Subhajit Ojha
Subham Bhunia	Subham Bhunia	Subham Bhunia	Subham Bhunia
Subhankar pradhan	Subhankar pradhan	Subhankar pradhan	Subhankar pradhan
Subhrajit Majhi	Subhrajit Majhi	Subhrajit Majhi	Subhrajit Majhi
Subrata Sahoo	Subrata Sahoo	Subrata Sahoo	Subrata Sahoo
Sudip Bhanja	Sudip Bhanja	Sudip Bhanja	Sudip Bhanja
Sudipta Bhunia			Sudipta Bhunia
Sudipta Hembram	Sudipta Hembram	Sudipta Hembram	Sudipta Hembram
Suman Ghosh		Suman Ghosh	
Sumandeep Patra	Sumandeep Patra	Sumandeep Patra	Sumandeep Patra
Sunit Jana	Sunit Jana	Sunit Jana	Sunit Jana
	Suprabhat Bera		Suprabhat Bera
Surajit Bera	Surajit Bera	Surajit Bera	Surajit Bera
Surajit Patra	Surajit Patra	Surajit Patra	Surajit Patra
Tamasa Chowdhury	Tamasa Chowdhury	Tamasa Chowdhury	Tamasa Chowdhury
Tuhin Das	Tuhin Das	Tuhin Das	Tuhin Das
Ujjal Gope	Ujjal Gope	Ujjal Gope	Ujjal Gope
	Upen Mandi		Upen Mandi

KHARAGPUR COLLEGE

DEPARTMENT OF MATHEMATICS

CERTIFICATE COURSE ON "ADVANCEMENT OF MATHEMATICS FOR UG LEVEL"

ATTENDANCE SHEET

				09/06/23	10/06/23	12/06/23	Lab Practice	Lab Practice	Lab Practice
1	Akash Pal	2nd	2218002	Akash pal	Akash pal	Akash pal	Akash pal	Akash pal	Akash pal
2	Amal Patra	4th	2118004	Amal Patra	Amal Patra	Amal Patra	Amal Patra	Amal Patra	Amal Patra
3	Argha Samanta	2nd	220119	Argha Samanta	Argha Samanta	Argha Samanta	Argha Samanta	Argha Samanta	Argha Samanta
4	Asha Rani Ganjan	4th	2118001	Asha Rani Ganjan	Asha Rani Ganjan	Asha Rani Ganjan	Asha Rani Ganjan	Asha Rani Ganjan	Asha Rani Ganjan
5	Ashima Dey	6th	2022018	Ashima Dey	Ashima Dey	Ashima Dey	Ashima Dey	Ashima Dey	Ashima Dey
6	Ayan Roy	4th	2118013	Ayan Roy	Ayan Roy	Ayan Roy	Ayan Roy	Ayan Roy	Ayan Roy
7	Biswajit Bhunia	4th	2118016	Biswajit Bhunia.	Biswajit Bhunia.	Biswajit Bhunia.	Biswajit Bhunia.	Biswajit Bhunia.	Biswajit Bhunia.
8	Debanjan Rana	2nd	2218013	Debanjan Rana	Debanjan Rana	Debanjan Rana	Debanjan Rana	Debanjan Rana	Debanjan Rana
9	Devipriya Dey	6th	2022025	Devipriya Dey	Devipriya Dey	Devipriya Dey	Devipriya Dey	Devipriya Dey	Devipriya Dey
10	Dipesh Bhattacharya	2nd	2218014	Dipesh Bhattacharya	Dipesh Bhattacharya	Dipesh Bhattacharya	Dipesh Bhattacharya	Dipesh Bhattacharya	Dipesh Bhattacharya
11	Dipti Patra	2nd	2218093	Dipti Patra	Dipti Patra	Dipti Patra	Dipti Patra	Dipti Patra	Dipti Patra
12	Gouranga Bag	2nd	2218016	Gouranga Bag	Gouranga Bag	Gouranga Bag	Gouranga Bag	Gouranga Bag	Gouranga Bag
13	Gourav Samanta	4th	2118021	Gourav Samanta	Gourav Samanta	Gourav Samanta	Gourav Samanta	Gourav Samanta	Gourav Samanta
14	Jitendra Kar	2nd	2218021	Jitendra kar	Jitendra kar	Jitendra kar	Jitendra kar	Jitendra kar	Jitendra kar
15	Jyotirmoy Dey	6th	2030005	Jyotirmay Dey			Jyotirmay Dey		Jyotirmay Dey
16	Krishnendu Dinda	2nd	2218027	Krishnendu Dinda	Krishnendu Dinda	Krishnendu Dinda	Krishnendu Dinda	Krishnendu Dinda	Krishnendu Dinda
17	Mahadeb Saren	4th	2118031	Mahadeb Saren	Mahadeb Saren	Mahadeb Saren	Mahadeb Saren	Mahadeb Saren	Mahadeb Saren
18	Manoj Rana	4th	2118033	Manoj Rana	Manoj Rana	Manoj Rana	Manoj Rana	Manoj Rana	Manoj Rana
19	Milan Manna	2nd	2218031	Milan Manna		Milan Manna		Milan Manna	
20	Monalisha Pradhan	2nd	2318033	Monalisha Pradhan	Monalisha Pradhan	Monalisha Pradhan	Monalisha Pradhan	Monalisha Pradhan	Monalisha Pradhan
21	Oindrila Sharangi	2nd	2218035	Oindrila Sharangi	Oindrila Sharangi	Oindrila Sharangi	Oindrila Sharangi	Oindrila Sharangi	Oindrila Sharangi
22	Palash Das	6th	2022037	Palash Das	Palash Das	Palash Das	Palash Das	Palash Das	Palash Das
23	Prabhat Kuila	2nd	220138	Prabhat kuila	Prabhat kuila	Prabhat kuila	Prabhat kuila	Prabhat kuila	Prabhat kuila

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ATTENDANCE SHEET

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ATTENDANCE SHEET

				09/06/23	10/06/23
24	Pratasna Ghosh	2nd	2218038	Pratasna Ghosh	Pratasna Ghosh
25	Pritam Patra	2nd	2218039	Pritam Patra	Pritam Patra
26	Rahul Das	4th	2118044	Rahul Das	Rahul Das
27	Rahul Ganjan	4th	2118046	Rahul Ganjan	Rahul Ganjan
28	Rajib Das	4th	2111052	Rajib Das	Rajib Das
29	Rajkumar Patra	6th	2022043	Rajkumar Patra	Rajkumar Patra.
30	Riju Pramanik	4th	2118057	Riju Pramanik	Riju Pramanik
31	Sagar Pratihar	6th	2022048	Sagar Pratihar	Sagar Pratihar
32	Sandipan Singha	2nd	2218055	Sandipan Singha	Sandipan Singha
33	Sanjib Bhunia	6th	2022053	Sanjib Bhunia	
34	Santanu Mondal	2nd	2218057	Santanu Mondal	Santanu Mondal
35	Sayan Bhattacharya	6th	2022095	Sayan Bhattacharya	Sayan Bhattacharya
36	Sayan Dey	4th	2118069	Sayan Dey	Sayan Dey
37	Sayan Mahapatra	2nd	2218059	Sayan Mahapatra	
38	Sayani Mahapatra	2nd	2218060	Sayani Mahapatra	Sayani Mahapatra
39	Shibangsu Bisai	4th	2118073	Shibangsu Bisai	Shibangsu Bisai
40	Shreya Nandi	2nd	2218061	Shreya Nandi	Shreya Nandi
41	Siuli Sau	2nd	2218062	Siuli Sau	Siuli Sau
42	Somnath Palai	4th	2118078	Somnath Palai	Somnath Palai
43	Sourav Khatua	4th	2118102	Sourav Khatua	Sourav Khatua
44	Souvik Chakraborty	6th	2022074	Souvik Chakraborty	Souvik Chakraborty
45	Souvik Das	2nd	2218070	Souvik Das	
46	Subhadip Dey	2nd		Subhadip Dey	Subhadip Dey
47	Subhadip Ghosh	6th	2030024		Subhadip Ghosh

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ATTENDANCE SHEET

12/06/23	Lab Practice	Lab Practice	Lab Practice
Pratasna Ghosh	Pratasna Ghosh	Pratasna Ghosh	Pratasna Ghosh
Pritam Patra	Pritam Patra	Pritam Patra	Pritam Patra
Rahul Das	Rahul Das	Rahul Das	Rahul Das
Rahul Ganjan	Rahul Ganjan	Rahul Ganjan	Rahul Ganjan
Rajib Das	Rajib Das	Rajib Das	Rajib Das
Rajkumar Patra	Rajkumar Patra	Rajkumar Patra	Rajkumar Patra
Riju Pramanik	Riju Pramanik	Riju Pramanik	Riju Pramanik
Sagar Pratihar	Sagar Pratihar	Sagar Pratihar	Sagar Pratihar
Sandipan Singha	Sandipan Singha	Sandipan Singha	Sandipan Singha
Sanjib Bhunia		Sanjib Bhunia	
Santanu Mondal	Santanu Mondal	Santanu Mondal	Santanu Mondal
Sayan Bhatta chaya	Sayan Bhattacharya	Sayan Bhattacharya	Sayan Bhattacharya
Sayan Dey	Sayan Dey	Sayan Dey	Sayan Dey
Sayan Mahapatra		Sayan Mahapatra	
Sayani Mahapatra	Sayani Mahapatra	Sayani Mahapatra	Sayani Mahapatra
Shibangsu Bisai	Shibangsu Bisai	Shibangsu Bisai	Shibangsu Bisai
Shreya Nandi		Shreya Nandi	Shreya Nandi
Siuli Sau	Siuli Sau	Siuli Sau	Siuli Sau
Somnath Palai	Somnath Palai	Somnath Palai	Somnath Palai
Sourav Khatua	Sourav Khatua	Sourav Khatua	Sourav Khatua
Souvik Chakraborty	Souvik Chakraborty	Souvik Chakraborty	Souvik Chakraborty
Souvik Das		Souvik Das	
Subhadip Dey	Subhadip Dey	Subhadip Dey	Subhadip Dey
	Subhadip Ghosh		Subhadip Ghosh

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ATTENDANCE SHEET

				09/06/23	10/06/23
48	Subhajit Bera	2nd	2218075	Subhajit Bera	Subhajit Bera
49	Subhajit Mahata	4th	2118085	Subhajit Mahata	Subhajit Mahata
50	Subhajit Ojha	2nd	2218076	Subhajit Ojha	Subhajit Ojha
51	Subham Bhunia	2nd	2218078	Subham Bhunia	Subham Bhunia
52	Subhankar Pradhan	4th	2118086	Subhankar Pradhan	Subhankar Pradhan
53	Subhrajit Majhi	6th	2022079	Subhrajit Majhi	Subhrajit Majhi
54	Subrata Sahoo	2nd	2218080	Subrata Sahoo	Subrata Sahoo
55	Sudip Bhanja	4th	2118088	Sudip Bhanja	Sudip Bhanja
56	Sudipta Bhunia	6th	2022082		Sudipta Bhunia
57	Sudipta Hembram	2nd	2218082	Sudipta Hembram	Sudipta Hembram
58	Suman Ghosh	6th	2022084	Suman Ghosh	
59	Sumandeep Patra	2nd	2218094	Sumandeep Patra	Sumandeep Patra
60	Sunit Jana	4th	2118093	Sunit Jana	Sunit Jana
61	Suprabhat Bera	6th	2022088	Suprabhat Bera	
62	Surajit Bera	4th	2118094	Surajit Bera	Surajit Bera
63	Surajit Patra	4th	2118096	Surajit Patra	Surajit Patra
64	Tamasa Chowdhury	4th	2118103	Tamasa Chowdhury	Tamasa Chowdhury
65	Tuhin Das	2nd	220166	Tuhin Das	Tuhin Das
66	Ujjal Gope	2nd	2218090	Ujjal Gope	Ujjal Gope
67	Upen Mandi	2nd	2218091		Upen Mandi

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ATTENDANCE SHEET

12/06/23	Lab Practice	Lab Practice	Lab Practice
Subhajit Bera	Subhajit Bera	Subhajit Bera	Subhajit Bera
Subhajit Mahata	Subhajit Mahata	Subhajit Mahata	Subhajit Mahata
Subhajit Ojha	Subhajit Ojha	Subhajit Ojha	Subhajit Ojha
Subham Bhunia	Subham Bhunia	Subham Bhunia	Subham Bhunia
Subhankar Pradhan	Subhankar Pradhan	Subhankar Pradhan	Subhankar Pradhan
Subhrajit Majhi	Subhrajit Majhi	Subhrajit Majhi	Subhrajit Majhi
Subrata Sahoo	S Sahoo	S sahoo	
Sudip Bhanja	Sudip Bhanja	Sudip Bhanja	Sudip Bhanja
	Sudipta Bhunia		Sudipta Bhunia
Sudipta Hembram	Sudipta Hembram	Sudipta Hembram	Sudipta Hembram
	Suman Ghosh		Suman Ghosh
Sumandeep Patra	Sumandeep Patra	Sumandeep Patra	Sumandeep Patra
Sunit Jana	Sunit Jana	Sunit Jana	Sunit Jana
Suprabhat Bera		Suprabhat Bera	
Surajit Bera	Surajit Bera	Surajit Bera	Surajit Bera
Surajit Patra	Surajit Patra	Surajit Patra	Surajit Patra
Tamasa Chowdhury	Tamasa Chowdhury	Tamasa Chowdhury	Tamasa Chowdhury
Tuhin Das	Tuhin Das	Tuhin Das	Tuhin Das
Ujjal Gope	Ujjal Gope	Ujjal Gope	Ujjal Gope
		Upen Mandi	

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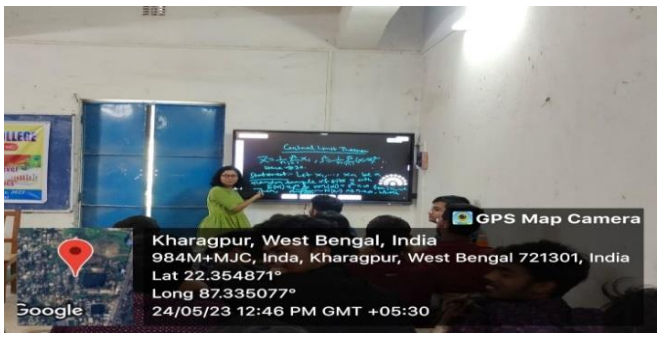
KHARAGPUR COLLEGE
KHARAGPUR

ESTD. : 1949
P.O.– Inda, Kharagpur, Municipality– Kharagpur, Sub-Division– Kharagpur,
P.S.– Kharagpur (T), Dist.– Paschim Medinipur, West Bengal, PIN– 721305.

DEPARTMENT OF MATHEMATICS, KHARAGPUR COLLEGE *organised*
Certificate Course on
"ADVANCEMENT OF MATHEMATICS FOR UG LEVEL"

Dr. Bidyut Kumar Samanta, Principal, Kharagpur college, delivering his speech at the Inaugural session of the Certificate Course.



Prof. A. Mondal, Assistant Professor of Mathematics, taking class for the Certificate course.

Sri B. Mondal, SACT of Mathematics, taking class for the Certificate course

Signature Not Verified
BIDYUT SAMANTA

Certificate Course, Department of Mathematics, Kharagpur College

TITLE: ADVANCEMENTS OF MATHEMATICS FOR UG LEVEL

Date of Commencement of class: 24th May, 2023

Date of Completion: 12th June, 2023

Duration: 30 Hours

Sl. No.	Topic		Resource Person	Theory/ Practical	Duration	Date & Time
1	Computational and optimization techniques using mathematical software	Basic concepts of MATLAB Functions and Graph plotting in MATLAB, Solution of Differential equation (Both ODE and PDE) using MATLAB	Mr. Manideep Roy, Research Scholar, IIT Kharagpur	Practical	2 hours	24.05.2023 4:00 pm
		Basic concepts of MATHEMATICA, Graph plotting etc.	Mr. Manideep Roy, Research Scholar, IIT Kharagpur	Practical	2 hours	26.05.2023 4:00 pm
		Solution of Linear Programming and Non-Linear Programming problem using LINGO	Mr. Manideep Roy, Research Scholar, IIT Kharagpur	Practical	2 hours	27.05.2023 4:00 pm
2	Application of Probability and Statistics	Probability and concept of distribution functions	Prof. Anjana Mondal, Assistant Professor, KGP College	Theory	2 hours	29.05.2023 4:00 pm
		Continuous and Discrete distributions	Prof. Anjana Mondal, Assistant Professor, Kharagpur College	Theory	2 hours	30.05.2023 4:00 pm
		Applications of probability distributions in real life	Prof. Anjana Mondal, Assistant Professor, Kharagpur College	Theory	2 hours	31.05.2023 4:00 pm
		Usefulness of statistics, some basic statistical tools	Prof. Anjana Mondal, Assistant Professor, Kharagpur College	Theory	2 hours	01.06.2023 4:00 pm
3	Fluid Mechanics	Basic concept of fluid, Different types of fluid	Mr. Buddhadeb Mondal, State Aided College Teacher, Kharagpur College	Theory	2 hours	02.06.2023 4:00 pm
		Types of fluid flow and their application in real life problems	Mr. Buddhadeb Mondal, State Aided College Teacher, Kharagpur College	Theory	2 hours	05.06.2023 4:00 pm
		Navier Stokes Equation and its applications	Mr. Buddhadeb Mondal, State Aided College Teacher, Kharagpur College	Theory	2 hours	06.06.2023 4:00 pm
		Reynolds number and its importance in fluid mechanics	Mr. Buddhadeb Mondal, State Aided College Teacher, Kharagpur College	Theory	2 hours	07.06.2023 4:00 pm

4	Fuzzy Mathematics	Basic concept of Fuzzy Sets Fuzzy Number and their representation	Mr. KousikBhattacharya, State Aided College Teacher, Kharagpur College	Theory	2 hours	08.06.2023 4:00 pm
		Fuzzy Number and their representation	Mr. Kousik Bhattacharya, State Aided College Teacher, Kharapur College	Theory	2 hours	09.06.2023 4:00 pm
		Application of fuzzy set theory in Supply Chain Modelling	Mr. Kousik Bhattacharya, State Aided College Teacher, Kharagpur College	Theory	2 hours	10.06.2023 4:00 pm
		Executive's Performance based Game theory	Mr. Kousik Bhattacharya, State Aided College Teacher, Kharagpur College	Theory	2 hours	12.06.2023 4:00 pm

Dr. Sangita Chakraborty
Associate Professor & Head,
Department of Mathematics,
Coordinator

Prof. Anjana Mondal
Assistant Professor,
Department of Mathematics,
Co-coordinator

KHARAGPUR COLLEGE
DEPARTMENT OF MATHEMATICS
CERTIFICATE COURSE ON "ADVANCEMENT OF MATHEMATICS FOR UG LEVEL"
DATE: From 24.05.2023 to 12.06.2023
Duration: 15 Days (30 Hours)

SYLLABUS

Module 1. Computational and Optimization Techniques using Mathematical Software

a. Basic concepts of MATLAB and MATHEMATICA
b. Functions and graph plotting in MATLAB
c. Solutions of differential equation (both ODE and PDE) using MATLAB and MATHEMATICA
d. Solutions of Linear Programming and Non-Linear Programming problem using LINGO

Module 2. Application of Probability and Statistics

a. Probability concept of distribution functions
b. Discrete and continuous distribution functions
c. Applications of probability distributions in real life
d. Usefulness of statistics
e. Some basic statistical tools

Module 3. Fluid Mechanics

a. Basic concept of fluid
b. Different types of fluid
c. Types of fluid flow and their applications in real life problems
d. Navier Stokes Equation and its applications
e. Reynolds number and its importance in fluid mechanics

Module 4. Fuzzy Mathematics

a. Basic concept of Fuzzy sets
b. Fuzzy number and their representation
c. Application of Fuzzy set theory in Supply Chain Modelling
d. Application of Fuzzy set theory in Executive's Performance based Game

Dr. Sangita Chakraborty
Associate Professor & Head,
Department of Mathematics,
Coordinator

Signature Not Verified
BIDYUT SAMANTA

Prof. Anjana Mondal
Assistant Professor,
Department of Mathematics,
Co-coordinator

SUMMARY REPORT ON

CERTIFICATE COURSE ENTITLED

"ADVANCEMENT OF MATHEMATICS FOR UG LEVEL"

Organised by

Department of Mathematics, Kharagpur College

DATE: From 24.05.2023 to 12.06.2023
DURATION: 15 Days (30 Hours)

Coordinators: 1. Dr. Sangita Chakraborty, Associate Professor and Head,
Department of Mathematics, Kharagpur College

2. Dr. Anjana Mondal, Assistant Professor,
Department of Mathematics, Kharagpur College

The certificate course is designed to provide UG students with a solid foundation in various mathematical concepts and techniques, which can lead to improve job prospects and career advancement opportunities. The course also provides a strong foundation for further study in mathematics and statistics or related fields.

This course offers introduction to a range of topics of pure mathematics, applied mathematics including Probability and Statistics, Fluid Mechanics, Fuzzy Mathematics, computational and optimization techniques using mathematical software: MATLAB programming, MATHEMATICA and LINGO. By completing the program, students will be equipping them to pursue a career in Mathematics and Statistics with confidence.

Module 1: *Computational and Optimization Techniques using Mathematical Software*

Taught by: Mr. Monideep Roy, PMRF, Indian Institute of Technology, Kharagpur

For the analysis, manipulation, and visualization of data, MATLAB offers strong tools. Data cleansing, filtering, analytics, graphing, and interactive visualization creation are among the capabilities it provides. The development and implementation of algorithms is a common usage for MATLAB.

In the certificate course, students have learned to use MATLAB to plot various kinds of graphs. Solving ordinary and partial differential equations in MATLAB and MATHEMATICA makes the process easier and takes less time. Finding solutions to linear and non-linear programming problems manually is quite time-consuming and complicated. However, MATLAB makes this task easier. Students have quite benefited from learning the technique of using MATLAB and MATHEMATICA to solve complicated problems. Further, this will help students in their higher studies and research.

Module 2: ***Application of Probability and Statistics***

Taught by: Dr. Anjana Mondal, Assistant Professor, Dept. of Mathematics, Kharagpur College

Probability theory has been motivated by real-life situations where an experiment is performed and the experimenter observes an outcome. Furthermore, the outcome may not be predicted with certainty. Probability is about interpreting and understanding these outcomes. It basically tells us how often different kinds ofoutcome will happen. As we all live in absolute randomness, its usefulness is wide. Like in, it is used in predicting weather forecast, to estimate potential customers that will be more likely to react positively to specific campaigns, based on their consumption patterns, to determine the best sports strategies for games and competitions, in analyzing insurance policies to determine which plans are best for customers and what deductible amounts they need.

It is not possible to draw reliable conclusions about real behaviour of a random variable on the basis of what we have discovered in our analysis. However, there isa way of generalizing the results of our limited analysis on random variables to broader behaviours, which help us to save time, money and reach more confident results. The way is to use proper probability distribution according to our situation. Lots of probability distribution models exist for different situations, and the key pointis that we have to select the right one that fits our data and helps us to explain what we want to get.

For example, Binomial distribution can answer what is the probability of getting three defective items in a batch of 100, two flue infections over 20 years, certain number ofside effects from a medicine, certain number of fraudulent transactions in a givenday. Geometric distribution can be used to know the probability that a banker will meet with less than 10 people before encountering someone who is filing bankruptcy, a company can go 5 weeks or longer without experiencing a network failure. Call centers use the Poisson distribution to model the number of expected calls per hour that they will receive, to find the probability that a restaurant willreceive more than a certain number of customers.

The most important probability distribution in Statistics is normal distribution. It isused in technical stock market analysis and other type of analyses, like heights, weights collected form a unbiased sample. Exponential distribution can be used in finding the probability that the time between earthquake occurrences, time between customers, time between geyser eruptions is some specific value. The Gamma distribution is used to model the time in between incoming calls at a call center alongwith the expected number of calls. There are several other applications of probability distributions in real life.

Module 3: ***Fluid Mechanics***

Taught by: Mr. Buddhadeb Mondal, SACT, Dept. of Mathematics, Kharagpur College

Fluid mechanics, the branch of science that deals with the study of fluids (liquids and gases) in a state of rest or motion is an important subject of Civil, Mechanical and Chemical Engineering. Its various branches are fluid statics, fluid kinematics and fluid dynamics.

Impact of fluid mechanics:

I. **Food processing:** Fluid mechanics is important in the food industry for processing and packaging food products. Students are used fluid dynamics concept in feature to optimize the design of equipment such as mixers, pumps, and conveyors to ensure that food is processed safely and efficiently.

II. **Water supply and Treatment:** Plumbing systems in our homes and buildings depend on fluid mechanics. Using fluid dynamics concept the flow of water through pipes, valves, and faucets can be analyzed by the students to ensure that the system is efficient and safe.

III. **Water sports:** Activities such as swimming, diving, and water polo all are depend on fluid mechanics principles. Students try to making a athletes in water sports, use fluid dynamics to optimize their movements and equipment to increase speed and efficiency. For example, swimmers use techniques such as streamlining and drag reduction to improve their speed and efficiency in the water.

IV. **Air Travel:** Fluid mechanics plays a significant role in the design and operation of airplanes. The study of aerodynamics, a branch of fluid mechanics, helps engineers optimize the shape and size of wings and other aircraft components to improve fuel efficiency and performance. In the context, this is motivated to students to make a aerospace engineer in future.

Overall, fluid mechanics is a fundamental field of study that has a significant impact on our daily lives.

Module 4: *Fuzzy Mathematics*

Taught by: Dr. Kousik Bhattacharya, SACT, Dept. of Mathematics, Kharagpur College

Fuzzy logic has a significant role to formulate models of different types of real-world problems. This is not the precise rules of the logic itself, but rather the use of qualitative statements to produce a quantitative result. The quantity that should be computed for the problem depends upon various parameters; Most of these parameters could be characterized as follows:

i) Parameter values and relations between them are uncertain and imprecise. Their estimation is often based on the subjective beliefs of decision maker.
ii) It is difficult to measure them, either because there is no unit of measurement or there is no quantitative criterion for representing their values.
iii) The knowledge available about their values and relations is incomplete.
iv) Some of them are vaguely and unclearly defined.

Fuzzy membership functions are often used in applications, because it models linguistic terms about, more or less, approximately quite well and in a natural way, and it also simplifies the operations on fuzzy numbers. Triangular fuzzy number are determined by three values [l, m, u], where l represents the lower bound, m the mean value and u the upper bound of a fuzzy number. The membership degrees are 0 for points l and u, and it reaches 1 for m. The larger the difference u-l, the greater the uncertainty in the represented data. Boundaries are subjective in nature, and are input by the user of the system.

Department of Mathematics * Kharagpur College**
Question Paper for Certificate Course on

"*Advancements of Mathematics for UG Level*"

MCQ Type Questions: Full Marks-20 : Time- 1 Hour : Date of Exam- 12th June, 2023

1. What is the output of the following code in MATLAB?
   p = 1:5 ; q = p.^3
   a. [1 125]
   b. [1 2 3 4 5]
   c. [1 8 27 64 125]
   d. [125 64 27 8 1]
2. A matrix of 1's of order 3x2 can be obtained in MATLAB using
   a. Zeros(3,2)
   b. Ones(3,2)
   c. ones(3,2)
   d. rand(3,2)
3. Let $A = \begin{pmatrix} 1 & 3 & 4 \\ 4 & 8 & 9 \\ 5 & 6 & 2 \end{pmatrix}$. The command for building this matrix is:
   a. A=[1 4 5;3 8 6;4 9 2]
   b. A=[1 3 4;4 8 9;5 6 2]
   c. A=[1 3 4; 1 4 5;6 8 9 2]
   d. A=[1 3 4;4 8 10;5 6 2]
4. Command for getting a submatrix of $B = \begin{pmatrix} 3 & 4 \\ 6 & 2 \end{pmatrix}$ of the matrix A is
   a. B=A(2:3;2:3)
   b. B=A(1:3;1:2)
   c. B=A(1:2;1:2)
   d. B=A(1:3;2:3)
5. Let $V = (1,2,3,4,5,6,7,8,9,10)$. How to find product of the elements of V
   a. V=1:10;sum(V)
   b. V=1:2:10;prod(V)
   c. V=1:10;prod(V)
   d. V=1:1:10;multi(V)
6. The probability of any event is
   a. is greater than 1
   b. lies between 0 and 1
   c. may be any real number
   d. none of these.
7. A coin is tossed three times in succession, the number of sample points in the sample space is
   a. 6
   b. 8
   c. 3
   d. 16
8. A number is chosen at random from first 100 natural numbers. The probability of the chosen number being multiple of 8 is
   a. 7/12
   b. 31/25
   c. 7/10
   d. 3/25
9. The range of a random variable X is
   a. $0 < X < \infty$
   b. $-\infty < X < 0$
   c. $-\infty < X < \infty$
   d. $-1 < X < 1$
10. If $f(x)$ be any probability density function, then
    a. $f(x) \geq 0 \; and \; \int_{-\infty}^{\infty} f(x)dx = 1.$
    b. $f(x) < 0 \; and \; \int_{-\infty}^{\infty} f(x)dx = 1.$

c. $f(x) > 0 \; and \; \int_{-\infty}^{\infty} f(x)dx = 0.$

d. $f(x) > 0 \; and \; \int_{-\infty}^{\infty} f(x)dx = 1.$

11. Let $f(x) = \begin{cases} kx(1-x), & 0 < x \leq 1 \\ 0, & elsewhere \end{cases}$. The value of k for which $f(x)$ defines a probability density function

a. 0
b. 6
c. 4
d. 5

12. What is fluid mechanics?

a. Study of fluid behaviour at rest
b. Study of fluid behaviour in motion
c. Study of fluid behaviour at rest and in motion
d. Study of fluid behaviour at rest and in motion

13. Which of the following is the basic principle of fluid mechanics?

a. Momentum principle
b. Energy equation
c. Continuity equation
d. All of the mentioned

14. When a fluid is called turbulent?

a. High viscosity of fluid
b. Reynolds number is greater than 2000
c. Reynolds number is less than 2000
d. The density of the fluid is low

15. Which of the following is a type of fluid based on viscosity?

a. Real Fluid
b. Ideal Fluid
c. Newtonian Fluid
d. All of the mentioned

16. The range of the membership function of a fuzzy set is

a. [0, 1]
b. [0, ∞)
c. $\mathbb{R}$
d. (-∞, 0]

17. If $X = \{a, b, c, d\}$ and fuzzy set $A = \frac{0.2}{a} + \frac{0.5}{b} + \frac{0.7}{c} + \frac{0.9}{d}$, then level set of a given fuzzy set A is:

a. $\{a, b, c, d\}$
b. $\{0.2, 0.5, 0.7, 0.9\}$
c. $\{0.3, 0.6, 0.8, 1.0\}$
d. $\{1, 2, 3, 4\}$

18. If $X = \{a, b, c, d\}$ and fuzzy set $A = \frac{0.8}{a} + \frac{1.0}{b} + \frac{0.3}{c} + \frac{0.1}{d}$, then the α −cut set for $\alpha = 0.3$ is:

a. $\{a, c\}$
b. $\{b, c\}$
c. $\{a, b, c\}$
d. $\{a, b\}$

19. Consider a fuzzy set A defined on the interval $X = [0, 10]$ of integers by the membership Junction $\mu_A(x) = \frac{x}{x+2}$ then the α −cut set for $\alpha = 0.3$ is:

a. {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
b. {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
c. {2, 3, 4, 5, 6, 7, 8, 9, 10}
d. None of the above

20. The height h(A) of a fuzzy set A is defined as h(A) = sup A(x). Then

a. h(A)=0
b. h(A)<1
c. h(A)>1
d. h(A)=1

Impact and Students Reception:

Students participating of the certificate course are very excited about to knowing the new concept of fuzzy set theory and decision making in the uncertain environment. Students have been quite benefited from learning the technique of using MATLAB and MATHEMATICA to solve complicated problems. Further, this will help students in their higher studies and research. By learning all these, students will be motivated to pursue these interesting and important topics in their higher studies. Moreover, this will help them in their competitive exams, JAM, NET, GATE, etc.

The attendance is satisfactory and most of the students are interested to study this topic in details. Their curiosity about to learn this type of different topics outside of their syllabus is more enthusiastic and significant for the teachers as well as the college also.

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Department of Mathematics * Kharagpur College**
Response Sheet for Evaluation of Certificate Course on
"Advancements of Mathematics for UG Level"

Name of the Student: SAYANI MAHAPATRA **Roll No.** 2218060 **Semester:** 2nd

MCQ Type Questions: Full Marks- 20 : Time- 1 Hour : **Date of Exam- 12th June, 2023**

Tick (√) the Correct Answer:

1. What is the output of the following code in MATLAB?
   p = 1:5 ; q = p.^3
   a. [1 125]
   b. [1 2 3 4 5]
   c. [1 8 27 64 125] ✓
   d. [125 64 27 8 1]
2. A matrix of 1's of order 3x2 can be obtained in MATLAB using
   a. Zeros(3,2)
   b. Ones(3,2)
   c. ones(3,2) ✓
   d. rand(3,2)
3. Let $A = \begin{pmatrix} 1 & 3 & 4 \\ 4 & 8 & 9 \\ 5 & 6 & 2 \end{pmatrix}$. The command for building this matrix is:
   a. A=[1 4 5;3 8 6;4 9 2]
   b. A=[1 3 4;4 8 9;5 6 2] ✓
   c. A=[1 3 4; 1 4 5;6 8 9 2]
   d. A=[1 3 4;4 8 10;5 6 2]
4. Command for getting a submatrix of $B = \begin{pmatrix} 3 & 4 \\ 6 & 2 \end{pmatrix}$ of the matrix A is
   a. B=A(2:3;2:3)
   b. B=A(1:3;1:2)
   c. B=A(1:2;1:2)
   d. B=A(1:3;2:3) ✓
5. Let $V = (1,2,3,4,5,6,7,8,9,10)$. How to find product of the elements of V
   a. V=1:10;sum(V)
   b. V=1:2:10;prod(V)
   c. V=1:10;prod(V) ✓
   d. V=1:1:10;multi(V)
6. The probability of any event is
   a. is greater than 1
   b. lies between 0 and 1 ✓
   c. may be any real number
   d. none of these.
7. A coin is tossed three times in succession, the number of sample points in the sample space is
   a. 6
   b. 8 ✓
   c. 3
   d. 16
8. A number is chosen at random from first 100 natural numbers. The probability of the chosen number being multiple of 8 is
   a. 7/12
   b. 31/25
   c. 7/10
   d. 3/25 ✓
9. The range of a random variable X is
   a. $0 < X < \infty$
   b. $-\infty < X < 0$ ✓
   c. $-\infty < X < \infty$

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d. $-1 < X < 1$

10. If $f(x)$ be any probability density function, then
    a. $f(x) \geq 0$ and $\int_{-\infty}^{\infty} f(x)dx = 1$.
    b. $f(x) < 0$ and $\int_{-\infty}^{\infty} f(x)dx = 1$.
    c. $f(x) > 0$ and $\int_{-\infty}^{\infty} f(x)dx = 0$.
    d. $f(x) > 0$ and $\int_{-\infty}^{\infty} f(x)dx = 1$.

11. Let $f(x) = \begin{cases} kx(1-x), & 0 < x \leq 1 \\ 0, & elsewhere \end{cases}$. The value of k for which $f(x)$ defines a probability density function
    a. 0
    b. 6
    c. 4
    d. 5

12. What is fluid mechanics?
    a. Study of fluid behaviour at rest
    b. Study of fluid behaviour in motion
    c. Study of fluid behaviour at rest and in motion
    d. Study of fluid behaviour at rest and in motion

13. Which of the following is the basic principle of fluid mechanics?
    a. Momentum principle
    b. Energy equation
    c. Continuity equation
    d. All of the mentioned

14. When a fluid is called turbulent?
    a. High viscosity of fluid
    b. Reynolds number is greater than 2000
    c. Reynolds number is less than 2000
    d. The density of the fluid is low

15. Which of the following is a type of fluid based on viscosity?
    a. Real Fluid
    b. Ideal Fluid
    c. Newtonian Fluid
    d. All of the mentioned

16. The range of the membership function of a fuzzy set is
    a. [0, 1]
    b. [0, ∞)
    c. R
    d. (-∞, 0]

17. If $X = \{a, b, c, d\}$ and fuzzy set $A = \frac{0.2}{a} + \frac{0.5}{b} + \frac{0.7}{c} + \frac{0.9}{d}$, then level set of a given fuzzy set A is:
    a. $\{a, b, c, d\}$
    b. {0.2,0.5,0.7,0.9}
    c. {0.3,0.6,0.8,1.0}
    d. {1,2,3,4}

18. If $X = \{a, b, c, d\}$ and fuzzy set $A = \frac{0.8}{a} + \frac{1.0}{b} + \frac{0.3}{c} + \frac{0.1}{d}$, then the α −cut set for $\alpha = 0.3$ is:
    a. $\{a, c\}$
    b. $\{b, c\}$
    c. $\{a, b, c\}$
    d. $\{a, b\}$

19. Consider a fuzzy set A defined on the interval $X = [0, 10]$ of integers by the membership Junction $\mu_A(x) = \frac{x}{x+2}$ then the α −cut set for $\alpha = 0.3$ is:
    a. {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
    b. {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
    c. {2, 3, 4, 5, 6, 7, 8, 9, 10}
    d. None of the above

20. The height h(A) of a fuzzy set A is defined as h(A) = sup A(x). Then
    a. h(A)=0
    b. h(A)<1
    c. h(A)>1
    d. h(A)=1

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Department of Mathematics * Kharagpur College**
Response Sheet for Evaluation of Certificate Course on

"Advancements of Mathematics for UG Level"

Name of the Student: SUBHAM BHUNIA **Roll No.** 2218078 **Semester:** 2

MCQ Type Questions: Full Marks- 20 ; Time- 1 Hour ; **Date of Exam- 12th June, 2023**

Tick (√) the Correct Answer:

1. What is the output of the following code in MATLAB?
   p = 1:5 ; q = p.^3
   a. [1 125]
   b. [1 2 3 4 5]
   c. [1 8 27 64 125] ✓
   d. [125 64 27 8 1]
2. A matrix of 1's of order 3x2 can be obtained in MATLAB using
   a. Zeros(3,2)
   b. Ones(3,2)
   c. ones(3,2) ✓
   d. rand(3,2)
3. Let $A = \begin{pmatrix} 1 & 3 & 4 \\ 4 & 8 & 9 \\ 5 & 6 & 2 \end{pmatrix}$. The command for building this matrix is:
   a. A=[1 4 5;3 8 6;4 9 2]
   b. A=[1 3 4;4 8 9;5 6 2] ✓
   c. A=[1 3 4; 1 4 5;6 8 9 2]
   d. A=[1 3 4;4 8 10;5 6 2]
4. Command for getting a submatrix of $B = \begin{pmatrix} 3 & 4 \\ 6 & 2 \end{pmatrix}$ of the matrix A is
   a. B=A(2:3;2:3)
   b. B=A(1:3;1:2)
   c. B=A(1:2;1:2)
   d. B=A(1:3;2:3) ✓
5. Let V = (1,2,3,4,5,6,7,8,9,10). How to find product of the elements of V
   a. V=1:10;sum(V)
   b. V=1:2:10;prod(V)
   c. V=1:10;prod(V) ✓
   d. V=1:1:10;multi(V)
6. The probability of any event is
   a. is greater than 1
   b. lies between 0 and 1
   c. may be any real number
   d. none of these. ✓
7. A coin is tossed three times in succession, the number of sample points in the sample space is
   a. 6
   b. 8 ✓
   c. 3
   d. 16
8. A number is chosen at random from first 100 natural numbers. The probability of the chosen number being multiple of 8 is
   a. 7/12
   b. 31/25
   c. 7/10
   d. 3/25 ✓
9. The range of a random variable X is
   a. $0 < X < \infty$
   b. $-\infty < X < 0$ ✓
   c. $-\infty < X < \infty$

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d. $-1 < X < 1$

10. If $f(x)$ be any probability density function, then
    a. $f(x) \geq 0$ and $\int_{-\infty}^{\infty} f(x)dx = 1$.
    b. $f(x) < 0$ and $\int_{-\infty}^{\infty} f(x)dx = 1$.
    c. $f(x) > 0$ and $\int_{-\infty}^{\infty} f(x)dx = 0$.
    d. $f(x) > 0$ and $\int_{-\infty}^{\infty} f(x)dx = 1$.

11. Let $f(x) = \begin{cases} kx(1-x), & 0 < x \leq 1 \\ 0, & elsewhere \end{cases}$. The value of k for which $f(x)$ defines a probability density function
    a. 0
    b. 6
    c. 4
    d. 5

12. What is fluid mechanics?
    a. Study of fluid behaviour at rest
    b. Study of fluid behaviour in motion
    c. Study of fluid behaviour at rest and in motion
    d. Study of fluid behaviour at rest and in motion

13. Which of the following is the basic principle of fluid mechanics?
    a. Momentum principle
    b. Energy equation
    c. Continuity equation
    d. All of the mentioned

14. When a fluid is called turbulent?
    a. High viscosity of fluid
    b. Reynolds number is greater than 2000
    c. Reynolds number is less than 2000
    d. The density of the fluid is low

15. Which of the following is a type of fluid based on viscosity?
    a. Real Fluid
    b. Ideal Fluid
    c. Newtonian Fluid
    d. All of the mentioned

16. The range of the membership function of a fuzzy set is
    a. [0, 1]
    b. [0, ∞)
    c. $\mathbb{R}$
    d. (-∞, 0]

17. If $X = \{a, b, c, d\}$ and fuzzy set $A = \frac{0.2}{a} + \frac{0.5}{b} + \frac{0.7}{c} + \frac{0.9}{d}$, then level set of a given fuzzy set A is:
    a. $\{a, b, c, d\}$
    b. {0.2,0.5,0.7,0.9}
    c. {0.3,0.6,0.8,1.0}
    d. {1,2,3,4}

18. If $X = \{a, b, c, d\}$ and fuzzy set $A = \frac{0.8}{a} + \frac{1.0}{b} + \frac{0.3}{c} + \frac{0.1}{d}$, then the α −cut set for $\alpha = 0.3$ is:
    a. $\{a, c\}$
    b. $\{b, c\}$
    c. $\{a, b, c\}$
    d. $\{a, b\}$

19. Consider a fuzzy set A defined on the interval $X = [0, 10]$ of integers by the membership Junction $\mu_A(x) = \frac{x}{x+2}$ then the α −cut set for $\alpha = 0.3$ is:
    a. {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
    b. {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
    c. {2, 3, 4, 5, 6, 7, 8, 9, 10}
    d. None of the above

20. The height h(A) of a fuzzy set A is defined as h(A) = sup A(x). Then
    a. h(A)=0
    b. h(A)<1
    c. h(A)>1
    d. h(A)=1

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Department of Mathematics * Kharagpur College**
Response Sheet for Evaluation of Certificate Course on
"Advancements of Mathematics for UG Level"

Name of the Student: MONALISHA PRADHAN **Roll No.** 2218033 **Semester:** 2nd

MCQ Type Questions: Full Marks- 20 : Time- 1 Hour : **Date of Exam- 12th June, 2023**

Tick (√) the Correct Answer:

1. What is the output of the following code in MATLAB?
   p = 1:5 ; q = p.^3
   a. [1 125]
   b. [1 2 3 4 5]
   c. [1 8 27 64 125] ✓
   d. [125 64 27 8 1]
2. A matrix of 1's of order 3x2 can be obtained in MATLAB using
   a. Zeros(3,2)
   b. Ones(3,2)
   c. ones(3,2) ✓
   d. rand(3,2)
3. Let $A = \begin{pmatrix} 1 & 3 & 4 \\ 4 & 8 & 9 \\ 5 & 6 & 2 \end{pmatrix}$. The command for building this matrix is:
   a. A=[1 4 5;3 8 6;4 9 2]
   b. A=[1 3 4;4 8 9;5 6 2] ✓
   c. A=[1 3 4; 1 4 5;6 8 9 2]
   d. A=[1 3 4;4 8 10;5 6 2]
4. Command for getting a submatrix of $B = \begin{pmatrix} 3 & 4 \\ 6 & 2 \end{pmatrix}$ of the matrix A is
   a. B=A(2:3;2:3)
   b. B=A(1:3;1:2)
   c. B=A(1:2;1:2) ✓
   d. B=A(1:3;2:3)
5. Let $V = (1,2,3,4,5,6,7,8,9,10)$. How to find product of the elements of V
   a. V=1:10;sum(V)
   b. V=1:2:10;prod(V)
   c. V=1:10;prod(V) ✓
   d. V=1:1:10;multi(V)
6. The probability of any event is
   a. is greater than 1
   b. lies between 0 and 1 ✓
   c. may be any real number
   d. none of these.
7. A coin is tossed three times in succession, the number of sample points in the sample space is
   a. 6
   b. 8 ✓
   c. 3
   d. 16
8. A number is chosen at random from first 100 natural numbers. The probability of the chosen number being multiple of 8 is
   a. 7/12
   b. 31/25
   c. 7/10
   d. 3/25 ✓
9. The range of a random variable X is
   a. $0 < X < \infty$
   b. $-\infty < X < 0$
   c. $-\infty < X < \infty$ ✓

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d. $-1 < X < 1$

10. If $f(x)$ be any probability density function, then
    a. $f(x) \geq 0$ and $\int_{-\infty}^{\infty} f(x)dx = 1$.
    b. $f(x) < 0$ and $\int_{-\infty}^{\infty} f(x)dx = 1$.
    c. $f(x) > 0$ and $\int_{-\infty}^{\infty} f(x)dx = 0$.
    d. $f(x) > 0$ and $\int_{-\infty}^{\infty} f(x)dx = 1$.

11. Let $f(x) = \begin{cases} kx(1-x), & 0 < x \leq 1 \\ 0, & elsewhere \end{cases}$. The value of k for which $f(x)$ defines a probability density function
    a. 0
    b. 6
    c. 4
    d. 5

12. What is fluid mechanics?
    a. Study of fluid behaviour at rest
    b. Study of fluid behaviour in motion
    c. Study of fluid behaviour at rest and in motion
    d. Study of fluid behaviour at rest and in motion

13. Which of the following is the basic principle of fluid mechanics?
    a. Momentum principle
    b. Energy equation
    c. Continuity equation
    d. All of the mentioned

14. When a fluid is called turbulent?
    a. High viscosity of fluid
    b. Reynolds number is greater than 2000
    c. Reynolds number is less than 2000
    d. The density of the fluid is low

15. Which of the following is a type of fluid based on viscosity?
    a. Real Fluid
    b. Ideal Fluid
    c. Newtonian Fluid
    d. All of the mentioned

16. The range of the membership function of a fuzzy set is
    a. [0, 1]
    b. $[0, \infty)$
    c. R
    d. $(-\infty, 0]$

17. If $X = \{a, b, c, d\}$ and fuzzy set $A = \frac{0.2}{a} + \frac{0.5}{b} + \frac{0.7}{c} + \frac{0.9}{d}$, then level set of a given fuzzy set A is:
    a. $\{a, b, c, d\}$
    b. {0.2,0.5,0.7,0.9}
    c. {0.3,0.6,0.8,1.0}
    d. {1,2,3,4}

18. If $X = \{a, b, c, d\}$ and fuzzy set $A = \frac{0.8}{a} + \frac{1.0}{b} + \frac{0.3}{c} + \frac{0.1}{d}$, then the α −cut set for $\alpha = 0.3$ is:
    a. $\{a, c\}$
    b. $\{b, c\}$
    c. $\{a, b, c\}$
    d. $\{a, b\}$

19. Consider a fuzzy set A defined on the interval $X = [0, 10]$ of integers by the membership Junction $\mu_A(x) = \frac{x}{x+2}$ then the α −cut set for $\alpha = 0.3$ is:
    a. {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
    b. {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
    c. {2, 3, 4, 5, 6, 7, 8, 9, 10}
    d. None of the above

20. The height h(A) of a fuzzy set A is defined as h(A) = sup A(x). Then
    a. h(A)=0
    b. h(A)<1
    c. h(A)>1
    d. h(A)=1

18/20

Department of Mathematics * Kharagpur College**
Response Sheet for Evaluation of Certificate Course on
"Advancements of Mathematics for UG Level"

Name of the Student: MAHADEB SAREN **Roll No.** 2118031 **Semester:** 4th

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MCQ Type Questions: Full Marks- 20 : Time- 1 Hour : **Date of Exam- 12th June, 2023**

Tick (√) the Correct Answer:

1. What is the output of the following code in MATLAB?
   p = 1:5 ; q = p.^3
   a. [1 125]
   b. [1 2 3 4 5]
   c. [1 8 27 64 125]
   d. [125 64 27 8 1]

2. A matrix of 1's of order 3x2 can be obtained in MATLAB using
   a. Zeros(3,2)
   b. Ones(3,2)
   c. ones(3,2)
   d. rand(3,2)

3. Let $A = \begin{pmatrix} 1 & 3 & 4 \\ 4 & 8 & 9 \\ 5 & 6 & 2 \end{pmatrix}$. The command for building this matrix is:
   a. A=[1 4 5;3 8 6;4 9 2]
   b. A=[1 3 4;4 8 9;5 6 2]
   c. A=[1 3 4; 1 4 5;6 8 9 2]
   d. A=[1 3 4;4 8 10;5 6 2]

4. Command for getting a submatrix of $B = \begin{pmatrix} 3 & 4 \\ 6 & 2 \end{pmatrix}$ of the matrix A is
   a. B=A(2:3;2:3)
   b. B=A(1:3;1:2)
   c. B=A(1:2;1:2)
   d. B=A(1:3;2:3)

5. Let $V = (1,2,3,4,5,6,7,8,9,10)$. How to find product of the elements of V
   a. V=1:10;sum(V)
   b. V=1:2:10;prod(V)
   c. V=1:10;prod(V)
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6. The probability of any event is
   a. is greater than 1
   b. lies between 0 and 1
   c. may be any real number
   d. none of these.

7. A coin is tossed three times in succession, the number of sample points in the sample space is
   a. 6
   b. 8
   c. 3
   d. 16

8. A number is chosen at random from first 100 natural numbers. The probability of the chosen number being multiple of 8 is
   a. 7/12
   b. 31/25
   c. 7/10
   d. 3/25

9. The range of a random variable X is
   a. $0 < X < \infty$
   b. $-\infty < X < 0$
   c. $-\infty < X < \infty$

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d. $-1 < X < 1$

10. If $f(x)$ be any probability density function, then
   a. $f(x) \geq 0$ and $\int_{-\infty}^{\infty} f(x)dx = 1$.
   b. $f(x) < 0$ and $\int_{-\infty}^{\infty} f(x)dx = 1$.
   c. $f(x) > 0$ and $\int_{-\infty}^{\infty} f(x)dx = 0$.
   d. $f(x) > 0$ and $\int_{-\infty}^{\infty} f(x)dx = 1$.

11. Let $f(x) = \begin{cases} kx(1-x), & 0 < x \leq 1 \\ 0, & elsewhere \end{cases}$. The value of k for which $f(x)$ defines a probability density function
   a. 0
   b. 6
   c. 4
   d. 5

12. What is fluid mechanics?
   a. Study of fluid behaviour at rest
   b. Study of fluid behaviour in motion
   c. Study of fluid behaviour at rest and in motion
   d. Study of fluid behaviour at rest and in motion

13. Which of the following is the basic principle of fluid mechanics?
   a. Momentum principle
   b. Energy equation
   c. Continuity equation
   d. All of the mentioned

14. When a fluid is called turbulent?
   a. High viscosity of fluid
   b. Reynolds number is greater than 2000
   c. Reynolds number is less than 2000
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15. Which of the following is a type of fluid based on viscosity?
   a. Real Fluid
   b. Ideal Fluid
   c. Newtonian Fluid
   d. All of the mentioned

16. The range of the membership function of a fuzzy set is
   a. [0, 1]
   b. [0, ∞)
   c. R
   d. (-∞, 0]

17. If $X = \{a, b, c, d\}$ and fuzzy set $A = \frac{0.2}{a} + \frac{0.5}{b} + \frac{0.7}{c} + \frac{0.9}{d}$, then level set of a given fuzzy set A is:
   a. $\{a, b, c, d\}$
   b. {0.2,0.5,0.7,0.9}
   c. {0.3,0.6,0.8,1.0}
   d. {1,2,3,4}

18. If $X = \{a, b, c, d\}$ and fuzzy set $A = \frac{0.8}{a} + \frac{1.0}{b} + \frac{0.3}{c} + \frac{0.1}{d}$, then the α −cut set for $\alpha = 0.3$ is:
   a. $\{a, c\}$
   b. $\{b, c\}$
   c. $\{a, b, c\}$
   d. $\{a, b\}$

19. Consider a fuzzy set A defined on the interval $X = [0, 10]$ of integers by the membership Junction $\mu_A(x) = \frac{x}{x+2}$ then the α −cut set for $\alpha = 0.3$ is:
   a. {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
   b. {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
   c. {2, 3, 4, 5, 6, 7, 8, 9, 10}
   d. None of the above

20. The height h(A) of a fuzzy set A is defined as h(A) = sup A(x). Then
   a. h(A)=0
   b. h(A)<1
   c. h(A)>1
   d. h(A)=1

19/20

Department of Mathematics * Kharagpur College**
Response Sheet for Evaluation of Certificate Course on
"Advancements of Mathematics for UG Level"

Name of the Student: TAMASA CHOWDHURY **Roll No.** 2118103 **Semester:** 4th

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MCQ Type Questions: Full Marks- 20 ; Time- 1 Hour ; **Date of Exam- 12th June, 2023**

Tick (√) the Correct Answer:

1. What is the output of the following code in MATLAB?
   p = 1:5 ; q = p.^3
   a. [1 125]
   b. [1 2 3 4 5]
   c. [1 8 27 64 125]
   d. [125 64 27 8 1]

2. A matrix of 1's of order 3x2 can be obtained in MATLAB using
   a. Zeros(3,2)
   b. Ones(3,2)
   c. ones(3,2)
   d. rand(3,2)

3. Let $A = \begin{pmatrix} 1 & 3 & 4 \\ 4 & 8 & 9 \\ 5 & 6 & 2 \end{pmatrix}$. The command for building this matrix is:
   a. A=[1 4 5;3 8 6;4 9 2]
   b. A=[1 3 4;4 8 9;5 6 2]
   c. A=[1 3 4; 1 4 5;6 8 9 2]
   d. A=[1 3 4;4 8 10;5 6 2]

4. Command for getting a submatrix of $B = \begin{pmatrix} 3 & 4 \\ 6 & 2 \end{pmatrix}$ of the matrix A is
   a. B=A(2:3;2:3)
   b. B=A(1:3;1:2)
   c. B=A(1:2;1:2)
   d. B=A(1:3;2:3)

5. Let $V = (1,2,3,4,5,6,7,8,9,10)$. How to find product of the elements of V
   a. V=1:10;sum(V)
   b. V=1:2:10;prod(V)
   c. V=1:10;prod(V)
   d. V=1:1:10;multi(V)

6. The probability of any event is
   a. is greater than 1
   b. lies between 0 and 1
   c. may be any real number
   d. none of these.

7. A coin is tossed three times in succession, the number of sample points in the sample space is
   a. 6
   b. 8
   c. 3
   d. 16

8. A number is chosen at random from first 100 natural numbers. The probability of the chosen number being multiple of 8 is
   a. 7/12
   b. 31/25
   c. 7/10
   d. 3/25

9. The range of a random variable X is
   a. $0 < X < \infty$
   b. $-\infty < X < 0$
   c. $-\infty < X < \infty$

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d. $-1 < X < 1$

10. If $f(x)$ be any probability density function, then
   a. $f(x) \geq 0$ and $\int_{-\infty}^{\infty} f(x)dx = 1$.
   b. $f(x) < 0$ and $\int_{-\infty}^{\infty} f(x)dx = 1$.
   c. $f(x) > 0$ and $\int_{-\infty}^{\infty} f(x)dx = 0$.
   d. $f(x) > 0$ and $\int_{-\infty}^{\infty} f(x)dx = 1$.

11. Let $f(x) = \begin{cases} kx(1-x), & 0 < x \leq 1 \\ 0, & elsewhere \end{cases}$. The value of k for which $f(x)$ defines a probability density function
   a. 0
   b. 6
   c. 4
   d. 5

12. What is fluid mechanics?
   a. Study of fluid behaviour at rest
   b. Study of fluid behaviour in motion
   c. Study of fluid behaviour at rest and in motion
   d. Study of fluid behaviour at rest and in motion

13. Which of the following is the basic principle of fluid mechanics?
   a. Momentum principle
   b. Energy equation
   c. Continuity equation
   d. All of the mentioned

14. When a fluid is called turbulent?
   a. High viscosity of fluid
   b. Reynolds number is greater than 2000
   c. Reynolds number is less than 2000
   d. The density of the fluid is low

15. Which of the following is a type of fluid based on viscosity?
   a. Real Fluid
   b. Ideal Fluid
   c. Newtonian Fluid
   d. All of the mentioned

16. The range of the membership function of a fuzzy set is
   a. [0, 1]
   b. [0, ∞)
   c. $\mathbb{R}$
   d. (-∞, 0]

17. If $X = \{a, b, c, d\}$ and fuzzy set $A = \frac{0.2}{a} + \frac{0.5}{b} + \frac{0.7}{c} + \frac{0.9}{d}$, then level set of a given fuzzy set A is:
   a. $\{a, b, c, d\}$
   b. {0.2,0.5,0.7,0.9}
   c. {0.3,0.6,0.8,1.0}
   d. {1,2,3,4}

18. If $X = \{a, b, c, d\}$ and fuzzy set $A = \frac{0.8}{a} + \frac{1.0}{b} + \frac{0.3}{c} + \frac{0.1}{d}$, then the α −cut set for $\alpha = 0.3$ is:
   a. $\{a, c\}$
   b. $\{b, c\}$
   c. $\{a, b, c\}$
   d. $\{a, b\}$

19. Consider a fuzzy set A defined on the interval $X = [0, 10]$ of integers by the membership Junction $\mu_A(x) = \frac{x}{x+2}$ then the α −cut set for $\alpha = 0.3$ is:
   a. {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
   b. {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
   c. {2, 3, 4, 5, 6, 7, 8, 9, 10}
   d. None of the above

20. The height h(A) of a fuzzy set A is defined as h(A) = sup A(x). Then
   a. h(A)=0
   b. h(A)<1
   c. h(A)>1
   d. h(A)=1

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