CA1: Online Assignment

CSE523: ADVANCED DATA STRUCTURE AND ALGORITHMS

MAX MARKS: 30

Last Date of Submission: **06-Oct-2021** Late submission would not be accepted.

***Submit your assignment only on UMS**

*** Assignment should be Handwritten only**

Section: K21ML

Reg. No.	Name	RollNo.	Set No.
12100559	Mogalraj Kushal Dath	A01	A
12100819	Lakkoju Asha	A02	B
12101546	Kunal Pamu	A03	C
12102959	Banala Rajesh	A04	A
12103921	P S Sai Avinash	A05	B
12106154	Rishabh Saxena	A06	C
12106756	Sapna Katoch	A07	A
12107802	Vikas Ruhil	A08	B
12108099	Umesh Verma	A09	C
12108690	Mohd Shahrukh	A10	A
12110529	Kumar Rethik	A11	B
12111866	Sushant Kumar	A12	C
12104489	Shreya Singh	A13	A
12111936	Ravindra Singh Kushwaha	A14	B
12110916	Taiwo Ekundayo Soewu	A15	C
12112501	Suyash Tiwari	A16	A
12113685	Sk Rakib Ul Islam Rahat	A17	B
12113689	Gouri Shankar Chakraborty	A18	C

Section: K21DS

Reg. No.	Name	RollNo.	Set No.
12100856	Pragathi Sudarshan	A01	A
12100921	Arbaj Ansari	A02	B
12101021	Aisha Karim	A03	C
12101270	Patil Yuvraj Deepak	A04	A
12101748	Md Khadimul Islam Zim	A05	B
12103328	Shveta Yadav	A06	C
12103891	Shaif Mehraj Makhdoomi	A07	A
12104030	Maloof Bashir	A08	B
12104215	Sumit Kumar	A09	C
12106034	Peetla Suresh	A10	A
12106696	Ritik Bansal	A11	B
12107356	Shalabh Dwivedi	A12	C
12107500	Akash Dilkumar	A13	A
12108582	CHITTEM Harika	A14	B
12109223	Tshering Lhamo	A15	C
12110068	Jatin Gupta	A16	A
12111124	Sivarathri Susrutha	A17	B
12111786	Deepak MVS	A18	C
12112439	Gedela Suseel Kumar	A19	A

Section: K21BB

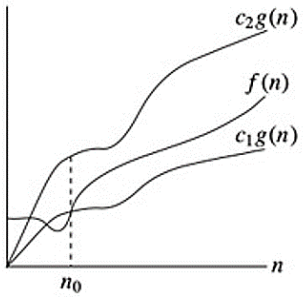
B	Name	RollNo.	Set No.
12100260	Wahengbam Indraram Singh	A01	A
12100338	Sahibdeep Singh	A02	B
12101033	Prashant Kumar	A03	C
12101407	Syed Simrin fathima	A04	A
12101434	Shambhavi Sinha	A05	B
12101542	Manish Kumar	A06	C
12102292	Dhupaati Krishna Theja	A07	A
12102490	Ramanjot	A08	B
12102713	Mahima Yadav	A09	C
12103566	Nikkondi Dheeraj	A11	A
12104076	Akash Pundir	A12	B
12104400	Hemant	A13	C
12104415	Sandeep Yadav	A14	A
12104623	Saurav Kumar	A15	B
12105651	Neeraj Sharma	A16	C
12105871	Manish kumar yadav	A17	A
12105949	Bodem Niharika	A19	B
12105979	Akash Singh	A20	C
12107361	KM Akanksha Pandey	A21	A
12107704	Sandeep Kaur	A22	B
12108171	Nayan Chakrabarty	A23	C
12108388	Suraj Kumar Sharma	A24	A
12108872	Md Abu Hanif	A25	B
12110473	Ritesh Kumar Shukla	A26	C
12110497	Athmakuri Vishnu Vardhan	A27	A
12110830	Nicodemus Peter Ngufuli	A28	B
12110897	Md Khadimul Islam Zim	A29	C
12111717	Aanand Kumar mishra	A31	A
12112504	ABHIUDEY KABOTRA	A32	B
12113547	Tarun Kumar	A33	C
12113664	Ankush Kumar Shah	A34	A

Please check your **Set No.** from this list and solve that assignment only. Wrong assignment attempled would result in deduction of marks.

SET-A

Note: Attempt all questions. Q1, Q2 are of 10 marks each and Q3, Q4 carries 5 marks each

1) Explain the following graph in detail (along with some suitable example) in context to Asymptotic notations in algorithms complexity.



2) Calculate (in form of a table of values) the growth rates of **log n, n, nlogn, n^2, n^3, 2^n** for the values of 'n' ranging from 1 to 18. After creating a table of values, summarize the "comparison of these growth rates" in a short paragraph.

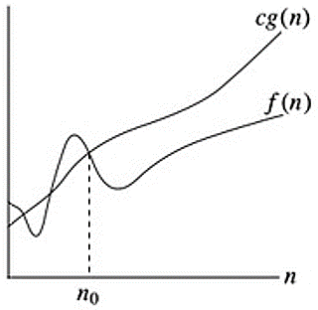
3) Solve the following recurrence relation (step-by-step) using Master's theorem. Also explain which case of Master theorem is applied to get the solution to this recurrence relation and why?
T(n) = <your registration number> T(n/2) + n^2
[Eg: If your registration number is 1210118, then this recurrence relation would be: **T(n) = 1210118 T(n/2) + n^2]**

4) **"The Big-O notation estimates the maximum running time possible for an algorithm of input size n".** Explain the statement with appropriate reason.

SET-B

Note: Attempt all questions. Q1, Q2 are of 10 marks each and Q3, Q4 carries 5 marks each

1) What does the following graph depict in context to asymptotic notations used for finding time complexity of an algorithm? Explain in detail with help of an example.



2) Calculate (in form of a table of values) the growth rates of **n, 100n, n^2, $11n^2$, n^3, 2^n** for the values of 'n' ranging from 1 to 19. After creating a table of values, summarize the "comparison of these growth rates" in a short paragraph.

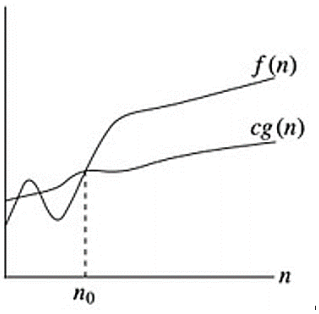
3) Solve the following recurrence relation (step-by-step) using Master's theorem. Also explain which case of Master theorem is applied to get the solution to this recurrence relation and why?
T(n) = <your registration number> T(n/2) + nlogn
[Eg: if your registration number is 1210118, then this recurrence relation would be **T(n)** = 1210118 T(n/2) + nlogn]

4) What do you mean by "**Time-Space tradeoff"** in context to algorithm complexity? Explain with a brief scenario.

SET-C

Note: Attempt all questions. Q1, Q2 are of 10 marks each and Q3, Q4 carries 5 marks each

1) What does the following graph depict in context to asymptotic notations used for finding time complexity of an algorithm? Explain in detail with help of an example.



2) Calculate (in form of a table of values) the growth rates of **n, n^2, n^2-n, n^2+99, n^3, n^3+234** for the values of **'n'= 2, 6, 10,14, … upto 74**. After creating a table of values, summarize the "comparison of these growth rates" in a short paragraph.

3) Solve the following recurrence relation using Master's theorem-
T(n) = <your registration number> T(n/4) + $n^{0.51}$
[Eg: if your registration number is 1210118, then this recurrence relation would be: **T(n)** = 1210118 T(n/4) + $n^{0.51}$]

4) Differentiate between **Exact time complexity** and **Approximate time complexity**. Which one is better and why?