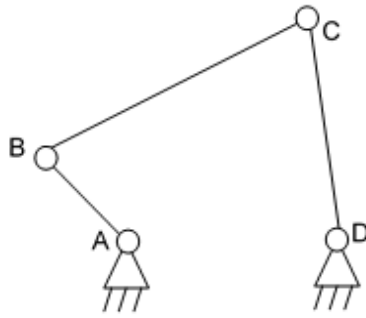


ME 370 : Adams Lab. : Exercise 2



ABCD is a 4R crank rocker mechanism with the following link lengths:

AB : 150 BC : 350 CD : 300 AD : 400

E, F and G are coupler points. The dimensions of links defining the coupler points are given in the subsequent pages.

If $BE + CE < BC$, then take $\text{ModifiedBE} = 2 * \text{GivenBE}$

If $BF + CF < BC$, then take $\text{ModifiedBF} = 2 * \text{GivenBF}$

If $BG + CG < BC$, then take $\text{ModifiedBG} = 2 * \text{GivenBG}$

State this change, if any, as the first statement in your submission.

Plot 1: Trace the coupler curves at E, F and G simultaneously.

Plot 2: Transmission angle (angle BCD) over one complete rotation of AB.

Keep gravity ON.

Identify which revolute joint needs to be most sturdy if all links have the same cross section and are constructed of the same material.

Hint: This can be obtained by studying the peaks of joint reactions through superimposed plots. This will be Plot 3.

Identify which revolute joint needs to be most sturdy if

AD is titanium, AB is copper, BC is steel and CD is magnesium.

Hint: This can be obtained by studying the peaks of joint reactions through superimposed plots. This will be Plot 4.

Construct a spatial 4-bar linkage of nearly the same link lengths in which the revolute joint at A allows movement only in X-Y plane and the revolute joint at D allows movement perpendicular to the X-Y plane. If necessary, change the link lengths of such a spatial 4-bar linkage so that the crank can rotate at least 80 degrees from its starting position. Capture four screenshots of the linkage in the isometric view with the crank at 0, 20, 40 and 60 degree positions, zero being the starting position.

(Hint: The joints at B and C cannot be revolute joints. It helps if the point C is in a plane different from the XY plane which contains points A, B and D.)

Prepare a PDF file with the filename <Ex2_RollNumber.pdf>. The file should contain the four plots and the four screenshots.

Upload the file in Moodle.

Roll Number	Name	BE	CE	BF	CF	BG	CG
210100144	Shubhranil Chatterjee	310	353	256	371	232	271
210100035	Ayush Agarwal	442	217	354	314	425	269
210100058	Faizan Ansari	440	348	192	325	338	194
210110072	Lakshay Garg	446	267	437	155	319	234
210100121	Pratham Srivastava	416	273	260	317	257	435
210020004	Abhisar Sinha	362	440	268	277	422	194
210040139	Satyam Mishra	267	267	189	214	277	392
210010002	Aayushi Barve	267	344	331	254	386	194
210040012	Alaukik Kumar Varma	422	227	172	405	361	403
210040048	Dhruv Pandey	176	376	286	230	323	315
210100165	Varun Karthik Makineni	389	396	368	233	152	283
210110049	Ishaan Kothari	165	401	277	344	377	369
210040160	Tanmay Jain	447	318	392	374	403	247
210020049	Gehna Gudhainia	184	307	173	247	397	377
210100126	Raj Kumar	259	170	278	354	370	267
210100138	Shlok Kishor Zanwar	308	266	228	180	233	219
210100127	Rohit Anil Kale	299	411	282	305	243	189
210100111	Prachit Gupta	281	287	427	383	202	390
210100129	Ruchir Mital Parekh	258	167	254	187	397	302
210040011	Akshat Agarwal	382	331	396	309	281	438
210100024	Arjun R	179	244	400	408	396	260
210100019	Anubha Vyasamudri	230	303	200	405	341	437
210100071	Himanshu Poonia	299	425	349	275	186	259
21D180041	Tanishk Saxena	260	255	295	424	437	229
210100145	Siddharth Farkiya	317	364	226	321	437	166
210100091	Mandage Aboli Dadabhau	409	243	435	333	188	375
210100052	Devanshu Hindoliya	339	160	371	362	348	294
21D100007	Ingle Parag Rajendra	287	183	309	184	321	440
210100152	Srishti Sinha	284	186	379	363	417	283
210100010	Aman Kumar	258	235	333	236	397	234
210100094	Mansi Devendra Ahire	247	339	443	245	271	157
210100122	Preet Pacharia	383	303	285	446	230	380
210100124	Priyansh Gopawat	282	164	229	433	437	355
210100167	Vedant Kashyap	421	309	422	162	204	426
210100123	Pritesh Kumar Sahu	290	353	279	265	223	334
210100136	Sharun Nikesh G	185	294	247	410	371	424
210100005	Abhishek Shrikisan Kedare	222	274	421	329	249	282
21D100025	Yelmalle Vedant Rajeev	156	284	259	393	226	292
21D100013	Mankirat	237	219	188	200	349	439
210100112	Prakhar Tiwari	242	259	238	303	349	150
210100146	Siddhesh Jayant Chaudhari	311	426	228	340	290	362
210100172	Vivek Ravindra Gohil	434	281	241	299	434	378
210100038	Ayush Ravindra Shegokar	439	231	190	326	217	261
210100057	Fahad B Ahmad	252	442	402	400	351	169
210100142	Shreyash Tulashidas Palve	374	289	391	351	263	445

210100020	Anushka Dubey	176	171	315	172	232	182
210100147	Simran Sinha	197	259	291	205	271	210
210100047	Chaure Prasad Rohidas	344	236	256	269	296	264
210100164	Vaidika Bamne	356	387	420	411	255	381
210100163	Umar Iqbal Teli	245	420	382	232	233	399
210100049	Chavan Aadesh Madan	388	340	436	301	199	401
210100150	Sonawane Sakshi Nagnath	286	371	365	327	356	211
210100089	Malothu Tejaswi	423	364	395	321	203	265
210100026	Arpit Kumar Raj	360	383	308	302	215	371
21D100011	Khan Yusha Mohammad Hami	302	385	255	324	169	403
210100048	Chavali Venkata Krishna Kaush	217	225	403	293	349	291
210100175	Yash Rampuria	348	379	442	218	296	385
210100173	Yash Malde	221	437	299	244	390	423
210100141	Shreyash Gupta	240	191	207	169	328	270
210020093	Prakhar Agarwal	364	174	163	399	409	414
210100064	Harsh Hitesh Shah	213	261	411	253	287	260
210100029	Aryan Hemant Chordia	440	261	176	172	392	310
210100034	Atharv Hardikar	193	436	418	230	436	270
210100154	Surabhi Gupta	345	220	392	334	194	194
210021001	Arjun Saikumar Simha	340	243	203	412	329	266
210020156	Yash Mandar Salunkhe	447	304	330	158	174	222
210110040	Dhruvi Purvesh Joshi	237	343	434	266	269	162
21D100018	Sanika Sachin Wagh	231	350	173	184	171	200
210100097	Mudit Sethia	383	253	307	381	188	418
210020129	Shivangi Kundu	307	177	266	351	172	354
210100085	Kushagra Chindak	310	397	264	412	425	185
210100072	Jainam Chirag Shah	444	408	278	247	255	364
210100168	Vedant Vikas Chandewar	381	382	338	184	150	156
21D110001	Anurag Deshpande	392	193	161	250	234	190
21D100002	Ayush Pulaiya	334	303	340	152	426	342
210100117	Pranjal	161	225	300	340	198	413
210040056	Harshil Pareshkumar Khatri	151	409	383	331	257	338
210100028	Aryan Gargi	362	328	251	292	365	417
21D180002	Abhishek Shivkumar Sarda	289	221	349	326	249	444
210100166	Vavadiya Kavankumar V	158	450	173	418	157	433
210100140	Shreyash Gupta	228	437	314	441	436	235
210100051	Dahibaokar Anish Sharad	240	268	152	284	229	346
210100056	Eshita Phatangare	187	228	195	318	307	183
210100062	Harshali	393	437	341	427	443	243
210100045	Chaitany Mohan Aggarwal	215	238	200	256	400	430
210100130	Samiksha Patel	214	208	307	398	171	421
210100022	Areeb Asgar	349	309	223	344	207	219
210100041	Bang Sarvesh Laleshkumar	212	282	353	165	249	282
210100162	Tipparthi Jaideep Chandra	302	344	153	280	247	308
210100040	Balne Vyshnavi	276	200	440	180	304	181
210100018	Ansh Preet	331	331	285	379	299	265

21D100019	Shraman Santara	221	192	274	424	439	164
210100032	Arya Shashank Raut	164	156	175	336	218	259
21D100022	Vishal Gajanan Puri	282	182	431	310	169	398
210100148	Singapakula Sridhar	156	217	169	265	272	329
210100077	Kadam Mayur Pradip	328	416	210	376	165	378
210100076	Jenil Dayma	229	411	343	338	432	410
210100084	Kunal Patidar	220	160	351	205	248	318
210100133	Satvik U Kaushik	327	403	310	413	316	273
210100128	Rohit Meena	297	262	446	384	314	256
210100104	Palithya Tejashwini	346	281	283	175	202	168
210100004	Abhishek Kushwah	414	339	159	349	414	329
210100158	Tejas Khyalia	338	445	183	192	325	303
210100080	Karan	212	378	296	318	202	175
210100031	Aryan Shailendra Chauhan	426	201	320	164	383	171
210100139	Shreya Biswas	187	324	441	155	186	343
210100053	Dhairya Meena	272	436	233	434	244	391
210100017	Anshika Tiwari	371	172	224	270	317	206
210100096	Moneesha P B	420	252	162	356	194	314
210100159	Tejas Vithoba Bhosale	223	287	426	198	196	159
210100099	Nayantara Ramakrishnan	397	192	240	317	421	159
210100025	Arnav Jaideep Kalgutkar	377	360	334	352	252	323
210040024	Aryan Vijay Bhosale	230	242	183	321	376	151
210100135	Saukhya Sunil Telge	179	184	198	376	413	223
21D100023	Vora Jay Bhaveshbhai	355	371	326	318	299	376
210100087	Kushal Agarwal	366	401	382	293	256	419
210020120	Saumya Bhavesh Sheth	187	255	236	339	187	389
210100137	Shiva Sudhan R	232	362	362	436	438	199
21D100001	Agrajah Vardhan Bhobe	427	297	263	435	408	247
210100120	Pratham Kulkarni	223	362	302	363	404	317
210100054	Dhritiman Sriram	271	169	153	430	443	314
210040064	Hemant Bamb	240	261	194	327	438	448
210100105	Pandey Rishikesh Udhav	206	430	372	413	377	248
210100055	Disha Pandey	186	294	389	318	287	173
21D100012	Kunal Kabra	193	184	190	196	426	326
210100044	Chaitanya Katti	232	224	241	236	421	415
210100043	Bhavani Sankar Lenka	260	196	361	393	445	389
210100169	Vighnesh Hareesh Nayak	227	228	334	340	205	203
210100108	Patel Arnav Digesh	341	188	186	407	308	223
210100009	Aman Khande	159	156	374	396	429	328
210101001	Gautam Siddhartha Khona	403	205	429	193	247	249
210040142	Sayyed Mohammad Sayeed Si	295	257	244	317	393	213
210100157	Tanmay Nitul Jain	327	271	267	242	313	304
21D170022	Kartik Sood	435	275	210	306	165	160
210100061	Hardik Kumar Srivastava	271	376	199	362	386	247
210100050	Chetan A Jadhav	394	428	358	306	258	232
210100060	Hanish Prashant Dhanwalkar	306	216	420	168	218	166

210020055	Harsh Kumar Doshi	369	180	413	417	169	258
210040077	Krishna Rathi	188	207	271	173	441	226
210100155	Suryansh Lunkar	396	292	288	298	153	156
210100070	Hemant Meena	371	265	371	175	157	202
210100008	Aman Badave	161	227	447	325	324	313
210100151	Srijan Jha	327	188	341	151	333	190
210100161	Thakre Nikhil Chandrashekhar	172	223	194	168	285	300
210100075	Jayant Guru Srivastava	270	427	188	375	440	432
210100153	Subram Das	384	364	293	437	352	314
210100101	Nitin Kumar	254	293	353	355	409	182
210100086	Kushagra Pankajrai Bothra	229	267	345	314	188	352
210100003	Abhishek Jain	279	349	182	369	290	263
210100042	Banoth Vinay Charan	384	398	368	396	237	201
210100016	Anjali Ajay Prabhakar	360	264	360	231	167	239
21D100015	Om Hanmant Desai	250	433	279	440	178	440
21D100017	Saloni Jaiswal	188	411	357	266	297	210
210100046	Chandan Amgoth	198	327	249	361	276	248
210100081	Kendre Srushti Anandrao	259	330	366	275	270	167
210100023	Arham Jain	256	169	217	342	416	232
210100093	Manish Kumar	388	418	255	155	256	278
21D100005	Divyanshu Rathore	239	217	253	446	278	150
210100109	Patel Dhruv	401	450	306	228	209	408
210100100	Nikita Kanwar	162	371	270	345	437	447
210100119	Prathamesh Rupesh Pahrkar	377	244	251	410	390	387
210100078	Kaiwalya Kiran Khade	205	260	219	243	238	312
210100170	Vishal	414	383	182	413	175	210
210100115	Pranav Taware	383	154	314	207	272	238
210100082	Krisanu Sarkar	362	160	205	403	258	392
210100074	Jayant Dnyaneshwar Dharmal	255	266	366	310	286	381
210100079	Kapil Kumbhare	408	228	192	404	383	183
210100174	Yash Prashant Adivarekar	392	235	368	428	241	355
200100144	Shashwat Kumar	272	193	377	241	290	150
210100059	Ganesh Iyer	421	353	183	414	423	305
210100103	Ojas Jain	239	193	306	235	441	434
210100156	Tanmay Ganguli	360	296	390	354	391	404
210020117	Sankalp Mistry	271	321	441	275	189	393
210020100	Priyanth Elango	177	395	181	307	350	320
210020019	Anusha Ajit Dhakras	258	232	316	232	160	305
210100002	Abhay Umesh Kinagi	341	165	357	312	228	282
210020130	Shivesh Gupta	352	430	270	187	331	233
21D100003	Darshan Jayesh Makwana	436	262	176	369	223	324
210100114	Pranav Sambhare	373	219	180	303	244	368
210100069	Harsh Uddhav Nikam	155	309	431	213	212	431
21D170012	Bhagyashree	328	221	397	421	406	443
210020061	Kanishk Malkan	376	364	163	378	405	343
210100039	Bagrecha Nakul Nirmal	403	231	242	334	438	225

21D100016	Patil Kush Shriram	411	188	438	379	254	333
210110024	Annant Jain	201	320	413	201	229	150
210100067	Harsh Kavediya	413	315	309	250	168	188
210100037	Ayush Raj	402	244	311	276	278	188
210100027	Arushi Srivastava	194	195	298	219	192	205
210040050	Gaurav Devendra Jain	418	179	448	238	316	253
21D100008	Ishaan Abhay Abhyankar	272	241	447	446	258	227
210100095	M Dheeraj Kumar Reddy	410	174	318	250	450	280
210100125	Radhika Saxena	296	241	215	273	275	411
210100090	Manali Mandar Manjarekar	186	308	403	438	289	314
210100102	Nivesh Maheshwari	204	185	333	395	319	247
21D100020	Sidhanth Soundarrajan	220	375	415	374	404	332
210100033	Ashita	190	429	240	161	228	325
210100118	Pranjal Animesh	329	161	337	405	280	411
210100113	Prakriti C. M. Janbandhu	222	227	203	231	241	393
210100073	Janhavi N Sonawane	223	402	384	237	327	290
210100110	Peddabeera Madhuri	406	426	362	153	170	182
21D100010	Jatin Kumar	178	426	365	259	204	447
210100065	Harshini Sreeram	366	188	445	237	165	382
210100132	Sanskar Santosh Gosavi	164	283	292	394	257	245
210100030	Aryan Kumar	238	380	218	385	406	224
210100015	Anish Kumar Sahu	157	436	234	283	357	329
210100012	Amruta Anil Deo	437	281	325	417	358	363
210100083	Kriti A	329	259	305	332	167	174
21D100004	Deep Agrawal	159	224	175	429	193	406
210100116	Pranav Vijay Solase	252	372	357	249	442	193
210100007	Akanksha Kadam	187	181	292	284	351	386
21D100021	Tejavath Gopinath	356	162	305	381	291	413
21D100024	Wakchaure Shrutika Vishnu	331	366	301	170	361	245
210100160	Tejaswini Yuvraj Patil	429	230	408	322	339	249
210100014	Aniruddh Goyal	228	297	422	248	393	377
210100107	Paryas	403	402	441	215	357	150
210100066	Harshit Pramod Patil	213	308	188	366	421	300
21D100009	Jadhav Purva Sunil	218	167	378	263	170	430
210100088	Lakshaya	261	160	447	206	281	178
210100134	Satyajeet Das	362	312	177	211	257	429
210100092	Mane Pramod Balaji	315	155	239	264	193	277
210100098	Muhammad Hanan P P	372	305	385	421	165	440
210100068	Harsh Raj	325	441	443	228	176	431
210100013	Ananya Meena	280	337	223	177	169	244
21D100014	Manmohan Singh	423	401	204	168	439	424
210100171	Vishant Vilas Kamble	384	168	405	158	179	214
20d100015	Lucky Kulhari	368	412	152	212	205	168