Report 2 - Design of hydraulic system

Design a hydraulic system (incl. hydraulic elements) for transfer of the compressive force F and the piston velocity v_1.
The lowering speed (velocity v_2) of the load can be regulated.
In the neutral position there must be no drop in the load due to leaks in the direction control valves.
Further needed parameters and hydraulic element determine from standards and details of manufacturers of selected hydraulic elements.

Tab. 1 Parameters of a hydraulic system

	A	B	C	D	E	F	G	H
External load F [N]	1500	2400	3700	1000	6000	5500	6500	5900
Velocity v_1 [m/s]	0.1	0.1	0.15	0.25	0.1	0.15	0.1	0.15
Pressure p_{RV} [MPa] on relief valve	16	16	16	16	20	20	20	16
Stroke s [m]	0,5	0,4	0,5	0,5	0,6	0,8	0,5	12
Mechanical/pressure efficiency η_{mhM} of hydraulic motor [-]	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow efficiency η_Q of hydraulic motor [-]	1	1	1	1	1	1	1	1
Pipe length l_1 [m]	1	1.5	2	2	2	1	1	1
Pipe length l_2 [m]	2	2	2	2	2	3	2	3
Pipe length l_3 [m]	2	2	2	2	2	3	2	3
Pipe length l_4 [m]	1	1.5	2	2	2	1	1	1

Name	Var.	Name	Var.
Bruno Parreira Gabriel	A	**Panneerselvam Abinav**	G
Jaheer Hussain Aathil Mohamed Rayees	B	**Raghunatha Vishnu Sagar**	H
Mahalingam Rahul	C	**Srinivasan Bipin Kumar**	D
Ganeshkumar Kailash	D		
Nandha Kumar Agathiya Nathan	E		
Senthil Kumar Barathkumar	F		

The report will contain:
1) Design of hydraulic system and hydraulic scheme
2) Calculation of required values
3) Selection of every hydraulic element in system (copy the type, designation, parameters and (figure) of the selected hydraulic elements from web pages to your protocol).
4) Calculation of loses in hydraulic system, markings of loses (pressure drops through the hydraulic element) in characteristics ($\Delta p - Q$ characteristic).
5) Conclusion