



UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION
SEPTEMBER 2014 SESSION

SUBJECT CODE : FRB30304
SUBJECT TITLE : PRODUCTION OF REFRIGERATION
LEVEL : BACHELOR
TIME/DURATION : 9.00 AM – 12:00 PM
(3 HOURS)
DATE : 4 JANUARY 2015

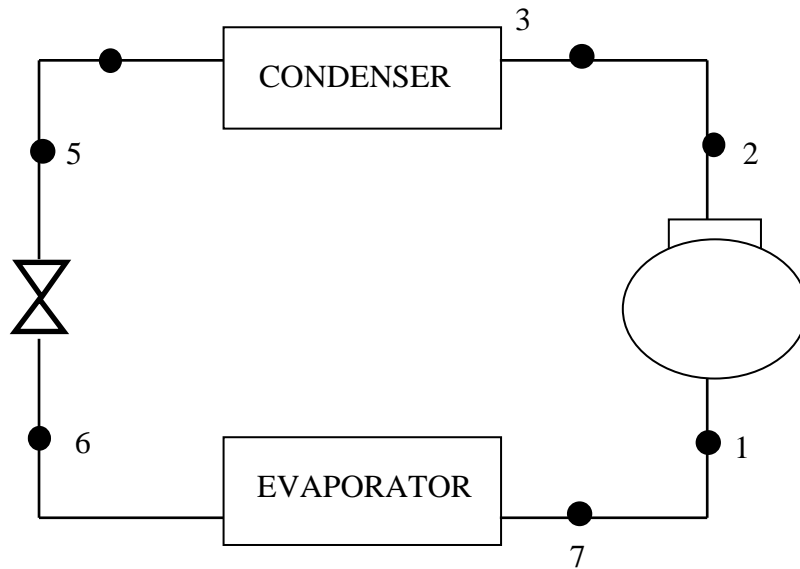
INSTRUCTIONS TO CANDIDATES

1. All documents authorized (Open Book Examination)
 2. Please read the instructions given in the question paper **CAREFULLY**.
 3. This question paper is printed on both sides of the paper.
 4. Please write your answers on the answer booklet provided.
 5. Answer should be written in blue or black ink except for sketching, graphic and illustration.
 6. This question paper consists only one section. Answer all questions.
 7. Answer all questions in English.
-

INSTRUCTION: Answer ALL questions.
Please use the answer booklet provided.

PART A

We use a single stage compressor with R407C to produce a refrigerating power under the following conditions as showing below:



Refrigerating power	$\dot{Q}_0 =$	100 kW
Temperature of evaporation	$\theta_E =$	-35 °C
Temperature of condensation	$\theta_C =$	47 °C
Superheat at exit of evaporator:	:	5 °C
Additional heating in the piping of suction	:	5 °C
Subcool of the liquid at exit condenser	:	4 °C
Extra cooling of the liquid before TXV	:	5 °C
Pressure drop for evaporator and condenser	:	1 °C

Question 1

To draw the refrigeration cycle that is described as above in Appendix 1.

[Note: Please return Appendix 1]

(15 marks)

Question 2

Find the operating conditions of compressor in terms of temperature and pressure.

Explain why you cannot implement a single-stage cycle for the condition stated above.

If you decide to implement two stage-cycles, what is the intermediate pressure you will choose?

(10 marks)

Question 3

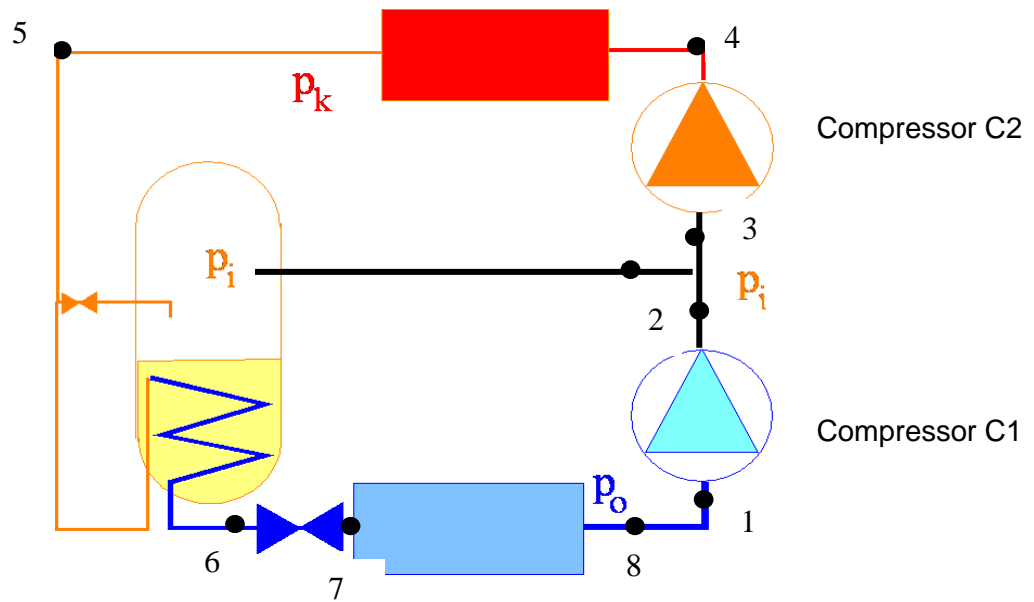
We decide to implement a refrigerating machine with a screw compressor equipped with an orifice economiser, with the operating mode $-35^{\circ}\text{C} / 47^{\circ}\text{C}$. We choose a cycle of the type "direct expansion", sub cooling of the liquid being ensured by an heat exchanger.

To supplement the general diagram of Appendix 2 (we will not represent the oil coolant circuit)

[Note: Please return Appendix 2]

(10 marks)

PART B



We want to produce 100 kW to cool brine (constant flow) with the mode $-25^{\circ}\text{C} / -30^{\circ}\text{C}$. We choose a cycle of partial injection with intermediate receiver. The conditions of the cold store are as follows:

- Temperature of evaporation: -35°C superheat at exit of evaporator: 5°C
- Temperature of condensation (maintained constant): 47°C sub cooling: 4°C
- Refrigerant is R407C
- Suction superheat of compressors is 10 K with 100% of useful superheat
- Intermediate temperature of saturation : -5°C
- Temperature difference at exit of the intermediate bottle : 5°C

Question 4

To trace, in a diagram by a show of hands, the cycle describes by the refrigerant.

(15 marks)

Question 5

Calculate the volumetric efficiency and effective efficiency for compressor; given that all the compressors have same volumetric and effective efficiency.

[Note: Refer to Appendix 5]

(20 marks)

Question 6

Select compressor model for compressor C1. Calculate the actual volume flow rate, mass flow rate and effective power of the compressor C1.

If the thermal losses of the compressor are 10% of the effective power of the compressor C1, calculate the thermodynamic characteristic of point 2.

Calculate mass flow rate of injection, \dot{m}_{inj} and mass flow rate of high pressure compressor, \dot{m}_H .

[Note: User cycle in Appendix 6]

(20 marks)

Question 7

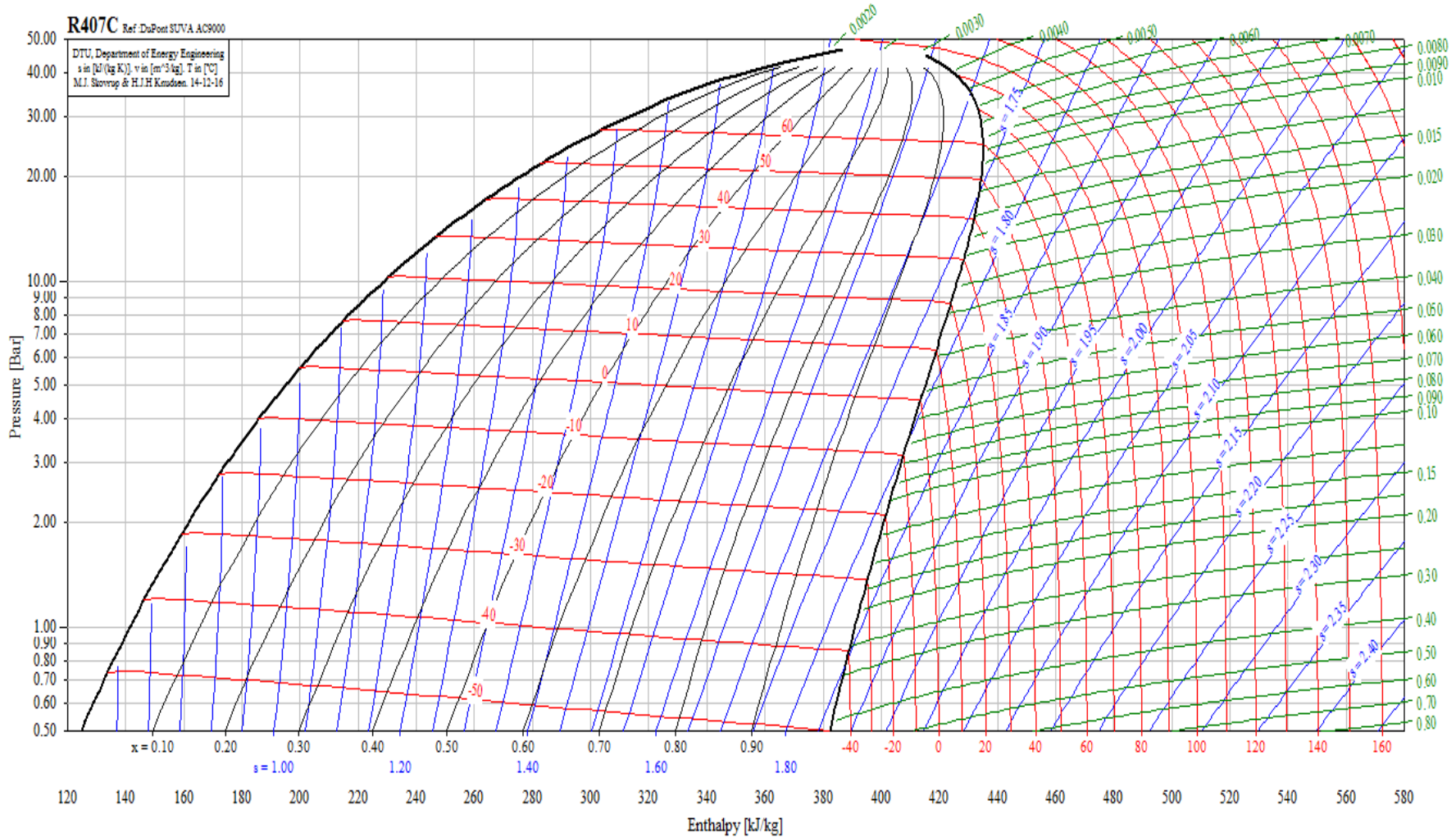
Select compressor model for compressor C2.

If the thermal losses of the compressor are 10% of the effective power of the compressor C2, calculate the thermodynamic characteristic of point 4.

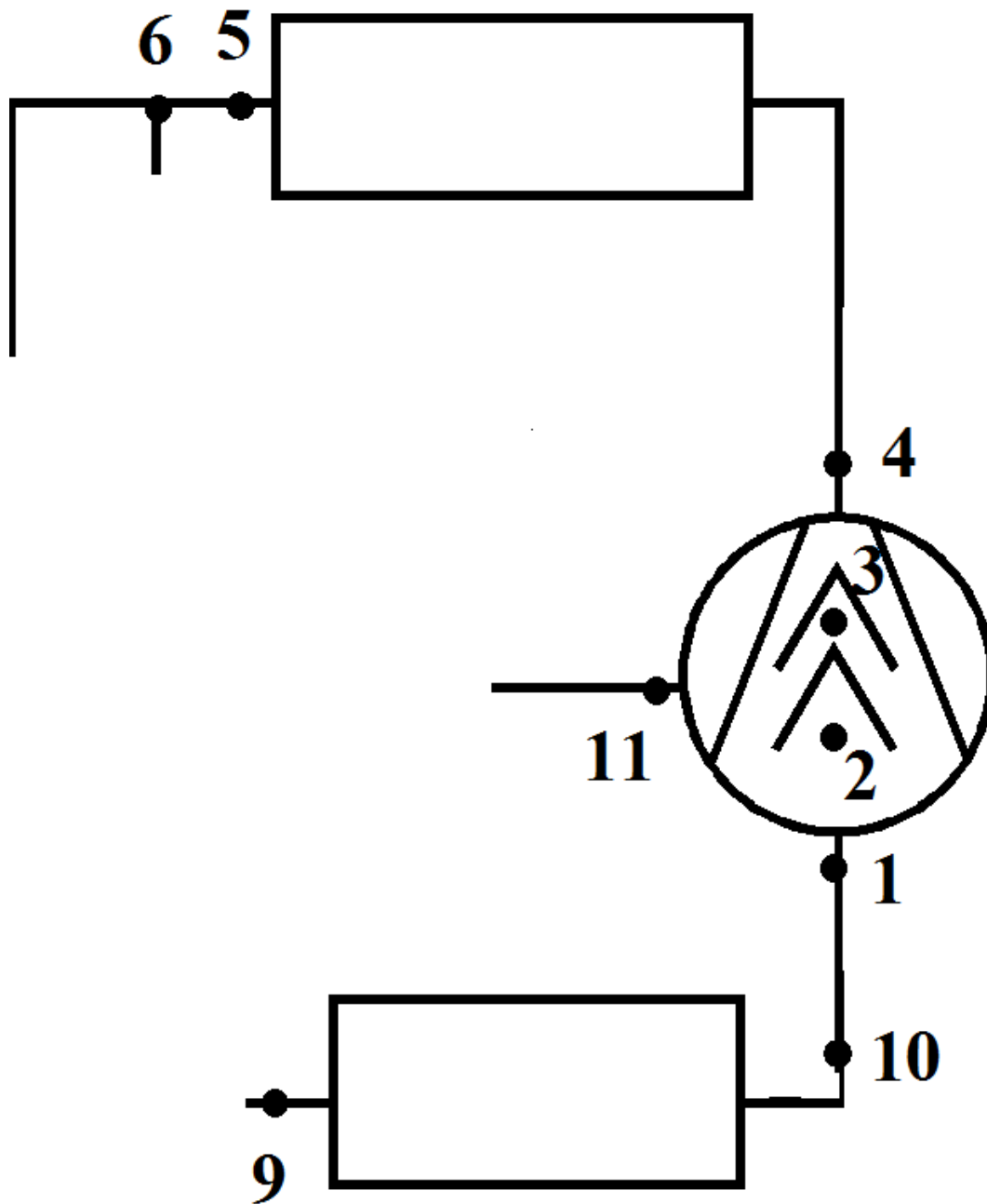
(10 marks)

END OF QUESTION

Appendix 1 : PH diagram of R407C



Appendix 2



Appendix 3: Table of R407C saturation

T (C)	Saturated Liquid				Saturated Vapour			
	P (bar)	h (kJ/kg)	s (J/kg K)	v (dm ³ /kg)	P (bar)	h (kJ/kg)	s (J/kg K)	v (dm ³ /kg)
-45	0.944	139.13	759.06	0.7207	0.655	383.87	1849.3	322.05
-40	1.196	145.58	787.21	0.7286	0.849	386.89	1838.1	252.41
-35	1.497	152.11	814.97	0.7368	1.087	389.88	1827.9	200.15
-30	1.856	158.71	842.36	0.7455	1.374	392.81	1818.5	160.42
-25	2.278	165.39	869.39	0.7546	1.717	395.69	1809.8	129.84
-20	2.771	172.15	896.09	0.7641	2.124	398.51	1801.8	106.03
-15	3.342	178.98	922.47	0.7742	2.603	401.25	1794.3	87.29
-10	3.999	185.89	948.56	0.7849	3.161	403.91	1787.3	72.40
-5	4.750	192.87	974.40	0.7961	3.807	406.49	1780.7	60.46
0	5.604	200.00	1000.00	0.8081	4.550	408.96	1774.4	50.79
5	6.570	207.04	1025.41	0.8207	5.399	411.33	1768.5	42.91
10	7.655	214.24	1050.67	0.8342	6.364	413.58	1762.7	36.43
15	8.869	221.51	1075.82	0.8486	7.455	415.70	1757.1	31.07
20	10.222	228.88	1100.90	0.8641	8.683	417.68	1751.7	26.60
25	11.723	236.35	1125.97	0.8807	10.058	419.52	1746.3	22.85
30	13.383	243.95	1151.08	0.8987	11.593	421.18	1740.8	19.68
35	15.211	251.70	1176.27	0.9183	13.299	422.65	1735.3	16.99
40	17.218	259.65	1201.62	0.9397	15.190	423.91	1729.6	14.68
45	19.416	267.84	1227.19	0.9633	17.281	424.91	1723.6	12.70
50	21.815	276.33	1253.03	0.9896	19.587	425.60	1717.2	10.98
55	24.429	285.17	1279.23	1.0192	22.124	425.91	1710.1	9.48
60	27.268	294.45	1305.84	1.0531	24.914	425.72	1702.0	8.16

Appendix 4: Table of thermodynamic coordinates-page 1

R407C			Superheated vapour (K)																
T (°C)	P _{sat} (Bar)		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
-45	0.6554	h(kJ/kg)	387.56	391.28	395.03	398.82	402.65	406.51	410.41	414.35	418.33	422.34	426.39	430.49	434.62	438.79	443.00	447.26	451.55
		s(J/kg.K)	1865.25	1881.04	1896.65	1912.08	1927.35	1942.46	1957.42	1972.24	1986.93	2001.50	2015.94	2030.27	2044.49	2058.60	2072.61	2086.52	2100.33
		v(m ³ /kg)	0.3299	0.3376	0.3454	0.3531	0.3607	0.3683	0.3759	0.3835	0.3911	0.3986	0.4061	0.4136	0.4211	0.4286	0.4360	0.4435	0.4509
-40	0.8495	h(kJ/kg)	390.66	394.45	398.27	402.13	406.02	409.95	413.91	417.91	421.95	426.02	430.13	434.28	438.47	442.69	446.96	451.26	455.61
		s(J/kg.K)	1854.10	1869.86	1885.44	1900.83	1916.05	1931.12	1946.03	1960.81	1975.45	1989.96	2004.35	2018.63	2032.79	2046.85	2060.80	2074.66	2088.42
		v(m ³ /kg)	0.2585	0.2646	0.2706	0.2767	0.2826	0.2886	0.2945	0.3004	0.3063	0.3121	0.3180	0.3238	0.3296	0.3354	0.3412	0.3470	0.3528
-35	1.0867	h(kJ/kg)	393.72	397.59	401.49	405.41	409.38	413.37	417.40	421.46	425.56	429.69	433.86	438.07	442.31	446.59	450.91	455.27	459.67
		s(J/kg.K)	1843.89	1859.64	1875.19	1890.56	1905.75	1920.79	1935.67	1950.40	1965.00	1979.47	1993.82	2008.05	2022.17	2036.18	2050.08	2063.89	2077.60
		v(m ³ /kg)	0.2050	0.2098	0.2146	0.2194	0.2241	0.2288	0.2335	0.2382	0.2428	0.2474	0.2520	0.2566	0.2612	0.2658	0.2703	0.2749	0.2794
-30	1.3736	h(kJ/kg)	396.74	400.69	404.66	408.67	412.70	416.76	420.86	424.99	429.15	433.34	437.58	441.84	446.14	450.48	454.86	459.27	463.72
		s(J/kg.K)	1834.51	1850.26	1865.82	1881.18	1896.36	1911.37	1926.23	1940.94	1955.51	1969.94	1984.25	1998.44	2012.52	2026.49	2040.35	2054.12	2067.78
		v(m ³ /kg)	0.1643	0.1682	0.1721	0.1759	0.1797	0.1835	0.1872	0.1910	0.1947	0.1984	0.2020	0.2057	0.2094	0.2130	0.2166	0.2203	0.2239
-25	1.7170	h(kJ/kg)	399.71	403.74	407.80	411.88	415.99	420.13	424.30	428.49	432.72	436.98	441.28	445.60	449.97	454.37	458.80	463.27	467.78
		s(J/kg.K)	1825.87	1841.65	1857.22	1872.59	1887.77	1902.78	1917.63	1932.32	1946.87	1961.28	1975.56	1989.72	2003.77	2017.70	2031.53	2045.25	2058.88
		v(m ³ /kg)	0.1330	0.1362	0.1394	0.1425	0.1456	0.1486	0.1517	0.1547	0.1577	0.1607	0.1637	0.1666	0.1696	0.1725	0.1754	0.1784	0.1813
-20	2.1242	h(kJ/kg)	402.62	406.75	410.89	415.06	419.25	423.46	427.70	431.97	436.27	440.60	444.96	449.35	453.77	458.23	462.73	467.25	471.82
		s(J/kg.K)	1817.88	1833.72	1849.33	1864.72	1879.92	1894.93	1909.78	1924.46	1939.00	1953.40	1967.66	1981.80	1995.82	2009.73	2023.52	2037.22	2050.81
		v(m ³ /kg)	0.1087	0.1113	0.1139	0.1165	0.1190	0.1215	0.1240	0.1265	0.1290	0.1314	0.1338	0.1363	0.1387	0.1411	0.1435	0.1459	0.1482
-15	2.6028	h(kJ/kg)	405.47	409.69	413.93	418.19	422.46	426.75	431.07	435.42	439.79	444.19	448.61	453.07	457.56	462.08	466.64	471.22	475.85
		s(J/kg.K)	1810.48	1826.39	1842.05	1857.49	1872.71	1887.75	1902.61	1917.30	1931.84	1946.23	1960.48	1974.61	1988.61	2002.49	2016.27	2029.94	2043.50
		v(m ³ /kg)	0.0895	0.0917	0.0939	0.0960	0.0981	0.1002	0.1023	0.1044	0.1064	0.1084	0.1104	0.1124	0.1144	0.1164	0.1184	0.1203	0.1223
-10	3.1610	h(kJ/kg)	408.24	412.57	416.91	421.26	425.62	430.00	434.40	438.82	443.27	447.74	452.24	456.77	461.32	465.91	470.53	475.18	479.86
		s(J/kg.K)	1803.59	1819.59	1835.33	1850.82	1866.09	1881.17	1896.05	1910.76	1925.31	1939.70	1953.95	1968.07	1982.06	1995.93	2009.69	2023.34	2036.88
		v(m ³ /kg)	0.0743	0.0761	0.0780	0.0798	0.0816	0.0833	0.0851	0.0868	0.0885	0.0902	0.0919	0.0935	0.0952	0.0968	0.0985	0.1001	0.1018
-5	3.8072	h(kJ/kg)	410.93	415.38	419.82	424.27	428.73	433.20	437.68	442.19	446.71	451.26	455.83	460.43	465.06	469.71	474.39	479.10	483.85
		s(J/kg.K)	1797.13	1813.25	1829.09	1844.66	1860.00	1875.12	1890.04	1904.78	1919.35	1933.75	1948.01	1962.13	1976.12	1989.98	2003.73	2017.36	2030.89
		v(m ³ /kg)	0.0621	0.0637	0.0652	0.0668	0.0683	0.0698	0.0712	0.0727	0.0741	0.0756	0.0770	0.0784	0.0798	0.0812	0.0826	0.0839	0.0853
0	4.5502	h(kJ/kg)	413.54	418.11	422.66	427.22	431.77	436.34	440.92	445.51	450.12	454.74	459.39	464.06	468.76	473.48	478.23	483.01	487.81
		s(J/kg.K)	1791.06	1807.32	1823.27	1838.95	1854.36	1869.55	1884.52	1899.30	1913.90	1928.33	1942.61	1956.73	1970.73	1984.59	1998.33	2011.95	2025.46
		v(m ³ /kg)	0.0522	0.0536	0.0549	0.0562	0.0575	0.0588	0.0601	0.0613	0.0625	0.0638	0.0650	0.0662	0.0674	0.0685	0.0697	0.0709	0.0720
5	5.3994	h(kJ/kg)	416.05	420.75	425.42	430.09	434.76	439.42	444.09	448.78	453.47	458.18	462.91	467.66	472.43	477.22	482.04	486.88	491.75
		s(J/kg.K)	1785.30	1801.74	1817.83	1833.62	1849.14	1864.40	1879.44	1894.27	1908.91	1923.38	1937.68	1951.82	1965.82	1979.69	1993.43	2007.05	2020.56
		v(m ³ /kg)	0.0441	0.0453	0.0465	0.0477	0.0488	0.0499	0.0510	0.0520	0.0531	0.0541	0.0552	0.0562	0.0572	0.0582	0.0592	0.0602	0.0612

Appendix 4: Table of thermodynamic coordinates-page 2

R407C			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
T (°C)	P _{sat} (Bar)																		
10	6.3645	h(kJ/kg)	418.45	423.29	428.10	432.89	437.67	442.44	447.21	451.99	456.77	461.57	466.38	471.21	476.05	480.92	485.81	490.72	495.66
		s(J/kg.K)	1779.80	1796.44	1812.71	1828.64	1844.27	1859.63	1874.75	1889.65	1904.34	1918.85	1933.18	1947.35	1961.37	1975.25	1989.00	2002.62	2016.12
		v(m ³ /kg)	0.0375	0.0386	0.0396	0.0406	0.0416	0.0425	0.0435	0.0444	0.0453	0.0462	0.0471	0.0480	0.0489	0.0498	0.0506	0.0515	0.0524
15	7.4555	h(kJ/kg)	420.75	425.74	430.69	435.61	440.51	445.39	450.27	455.14	460.02	464.91	469.81	474.71	479.64	484.58	489.54	494.53	499.53
		s(J/kg.K)	1774.51	1791.39	1807.86	1823.95	1839.72	1855.19	1870.41	1885.38	1900.14	1914.69	1929.07	1943.27	1957.32	1971.22	1984.97	1998.60	2012.11
		v(m ³ /kg)	0.0320	0.0330	0.0339	0.0348	0.0356	0.0365	0.0373	0.0381	0.0389	0.0397	0.0405	0.0413	0.0420	0.0428	0.0435	0.0443	0.0450
20	8.6830	h(kJ/kg)	422.92	428.08	433.18	438.24	443.26	448.27	453.25	458.24	463.21	468.19	473.18	478.17	483.18	488.20	493.24	498.30	503.37
		s(J/kg.K)	1769.38	1786.54	1803.23	1819.51	1835.44	1851.04	1866.36	1881.43	1896.26	1910.88	1925.30	1939.55	1953.62	1967.55	1981.33	1994.97	2008.48
		v(m ³ /kg)	0.0275	0.0283	0.0291	0.0299	0.0307	0.0314	0.0322	0.0329	0.0336	0.0343	0.0350	0.0356	0.0363	0.0370	0.0376	0.0383	0.0389
25	10.058	h(kJ/kg)	424.96	430.30	435.56	440.77	445.93	451.06	456.17	461.26	466.34	471.42	476.50	481.58	486.67	491.78	496.89	502.02	507.17
		s(J/kg.K)	1764.36	1781.83	1798.78	1815.28	1831.38	1847.14	1862.58	1877.75	1892.67	1907.36	1921.84	1936.14	1950.25	1964.21	1978.01	1991.67	2005.20
		v(m ³ /kg)	0.0236	0.0244	0.0251	0.0258	0.0265	0.0272	0.0278	0.0285	0.0291	0.0297	0.0303	0.0309	0.0315	0.0321	0.0327	0.0332	0.0338
30	11.5928	h(kJ/kg)	426.85	432.39	437.83	443.20	448.51	453.78	459.01	464.21	469.40	474.58	479.76	484.94	490.11	495.30	500.50	505.71	510.93
		s(J/kg.K)	1759.39	1777.23	1794.47	1811.21	1827.52	1843.44	1859.02	1874.31	1889.33	1904.10	1918.65	1933.01	1947.17	1961.16	1974.99	1988.68	2002.22
		v(m ³ /kg)	0.0204	0.0211	0.0218	0.0224	0.0230	0.0236	0.0242	0.0248	0.0253	0.0259	0.0264	0.0269	0.0275	0.0280	0.0285	0.0290	0.0295
35	13.299	h(kJ/kg)	428.58	434.35	439.98	445.52	450.99	456.40	461.76	467.09	472.39	477.68	482.96	488.23	493.50	498.77	504.05	509.34	514.64
		s(J/kg.K)	1754.41	1772.67	1790.25	1807.27	1823.80	1839.91	1855.65	1871.07	1886.20	1901.07	1915.70	1930.12	1944.33	1958.37	1972.24	1985.95	1999.52
		v(m ³ /kg)	0.0177	0.0183	0.0189	0.0195	0.0200	0.0206	0.0211	0.0216	0.0221	0.0226	0.0231	0.0235	0.0240	0.0245	0.0249	0.0254	0.0258
40	15.1905	h(kJ/kg)	430.13	436.14	442.00	447.73	453.36	458.92	464.43	469.88	475.31	480.71	486.09	491.46	496.83	502.19	507.55	512.92	518.30
		s(J/kg.K)	1749.34	1768.09	1786.07	1803.40	1820.18	1836.51	1852.43	1868.00	1883.25	1898.23	1912.95	1927.44	1941.72	1955.80	1969.72	1983.46	1997.05
		v(m ³ /kg)	0.0153	0.0159	0.0164	0.0170	0.0175	0.0180	0.0185	0.0189	0.0194	0.0198	0.0202	0.0207	0.0211	0.0215	0.0219	0.0223	0.0227
45	17.2811	h(kJ/kg)	431.48	437.77	443.86	449.80	455.61	461.34	466.99	472.59	478.14	483.66	489.15	494.63	500.09	505.54	511.00	516.45	521.91
		s(J/kg.K)	1744.12	1763.44	1781.86	1799.55	1816.63	1833.19	1849.32	1865.05	1880.44	1895.54	1910.35	1924.93	1939.28	1953.43	1967.39	1981.17	1994.80
		v(m ³ /kg)	0.0133	0.0138	0.0144	0.0148	0.0153	0.0158	0.0162	0.0166	0.0170	0.0174	0.0178	0.0182	0.0186	0.0189	0.0193	0.0197	0.0200
50	19.587	h(kJ/kg)	432.58	439.19	445.55	451.72	457.73	463.64	469.45	475.19	480.88	486.52	492.13	497.71	503.28	508.83	514.38	519.92	525.46
		s(J/kg.K)	1738.61	1758.62	1777.57	1795.67	1813.08	1829.92	1846.26	1862.19	1877.74	1892.96	1907.89	1922.56	1936.99	1951.21	1965.22	1979.05	1992.72
		v(m ³ /kg)	0.0115	0.0121	0.0125	0.0130	0.0134	0.0138	0.0142	0.0146	0.0150	0.0154	0.0157	0.0161	0.0164	0.0167	0.0171	0.0174	0.0177
55	22.124	h(kJ/kg)	433.38	440.38	447.04	453.47	459.71	465.80	471.79	477.69	483.52	489.29	495.02	500.72	506.39	512.05	517.69	523.32	528.95
		s(J/kg.K)	1732.69	1753.54	1773.10	1791.69	1809.48	1826.63	1843.23	1859.36	1875.09	1890.46	1905.52	1920.29	1934.81	1949.10	1963.18	1977.07	1990.77
		v(m ³ /kg)	0.0100	0.0105	0.0110	0.0114	0.0118	0.0122	0.0125	0.0129	0.0132	0.0136	0.0139	0.0142	0.0145	0.0148	0.0151	0.0154	0.0157
60	24.914	h(kJ/kg)	433.83	441.29	448.31	455.03	461.51	467.82	474.00	480.07	486.05	491.96	497.82	503.64	509.43	515.18	520.93	526.65	532.37
		s(J/kg.K)	1738.61	1758.62	1777.57	1795.67	1813.08	1829.92	1846.26	1862.19	1877.74	1892.96	1907.89	1922.56	1936.99	1951.21	1965.22	1979.05	1992.72
		v(m ³ /kg)	0.0115	0.0121	0.0125	0.0130	0.0134	0.0138	0.0142	0.0146	0.0150	0.0154	0.0157	0.0161	0.0164	0.0167	0.0171	0.0174	0.0177

Appendix 5: Performance of compressors installed

COMPRESSOR DATA

Suction temperature : 20 °C
 Sub Cooling : 0 °C
 Compressor with swept volume 500 m³/h

Cooling Capacity (kW)

Tcond(°C)	T evaporation(°C)							
	-5	-10	-15	-20	-25	-30	-35	-40
-5				223.14	179.56	143.12	112.88	88.01
0			266.67	216.49	174.22	138.87	109.54	85.42
5		315.93	258.54	209.91	168.95	134.68	106.24	82.85
10	370.90	305.74	250.24	203.20	163.56	130.40	102.87	80.22
15	358.32	295.43	241.84	196.41	158.12	126.07	99.46	77.57
20	345.58	284.99	233.35	189.54	152.61	121.69	96.01	74.89
25	305.27	251.81	206.22	167.53	134.91	107.59	84.90	66.22
30	293.21	241.93	198.17	161.02	129.68	103.44	81.63	63.68
35	280.90	231.84	189.95	154.38	124.36	99.20	78.29	61.08
40	268.28	221.50	181.53	147.57	118.89	94.86	74.88	58.42
45	255.29	210.85	172.86	140.56	113.27	90.38	71.36	55.68
50	241.83	199.82	163.88	133.29	107.44	85.75	67.71	52.84
55	227.80	188.32	154.51	125.72	101.36	80.92	63.91	49.89
60	213.08	176.26	144.69	117.77	94.99	75.86	59.92	46.78

Absorbed Power (kW)

Tcond(°C)	T evaporation(°C)							
	-5	-10	-15	-20	-25	-30	-35	-40
-5				32.72	33.83	33.41	31.84	29.46
0			38.07	39.73	39.62	38.15	35.69	32.54
5		43.94	46.27	46.56	45.27	42.78	39.44	35.55
10	50.35	53.45	54.25	53.21	50.76	47.28	43.09	38.48
15	61.29	62.70	62.01	59.68	56.11	51.66	46.64	41.33
20	71.93	71.70	69.57	65.98	61.32	55.93	50.10	44.11
25	79.15	77.39	74.00	69.38	63.87	57.80	51.45	45.04
30	88.83	85.58	80.88	75.12	68.62	61.69	54.60	47.58
35	98.23	93.54	87.58	80.70	73.24	65.49	57.68	50.05
40	107.36	101.28	94.09	86.14	77.74	69.18	60.68	52.46
45	116.24	108.81	100.43	91.43	82.13	72.78	63.60	54.81
50	124.87	116.13	106.59	96.58	86.40	76.28	66.45	57.10
55	133.25	123.24	112.59	101.60	90.55	79.70	69.23	59.33
60	141.40	130.16	118.42	106.48	94.60	83.02	71.94	61.51

Model	A	B	C	D	E	F	G	H
Swept Volume	220	250	300	370	450	620	750	900

Appendix 6: Table of characteristic for User Cycle in PART B

Part B
User cycle

R134a

	1	2is	2	3	4is	4	5	6	7	8	9
Tsat	-35	-5	-5	-5	47	47	47	47	-35	-35	-5
P (Bar)	1.09	3.81	3.81	3.81	20.35	20.35	20.35	20.35	1.09	1.09	3.81
T (°C)	-30	118.47			193.46		43	0	-35	-30	5
H(kJ/kg)	393.72	521.41			590.62		264.54	200.00	200.00	393.72	415.38
s(kJ/kg.K)	1.8439	1.8439			2.1385						
v (dm ³ /kg)	205.02										