B. Perform testing of hypothesis using chi-squared test of independence.

In a study to understand the performance of M. Sc. IT Part -1 class, a college selects a random sample of 100 students. Each student was asked his grade obtained in B. Sc. IT. Thesample is as given below.

Sr. No	Roll No	Name	Gen	Grd
1	1	Gaborone	m	O
2	2	Francesco	m	O
3	5	Niamey	m	O
4	13	Maxixe	m	O
5	16	Tema	m	O
6	17	Kumasi	m	O
7	34	Blida	m	O
8	35	Oran	m	O
9	38	Saefda	m	O
10	42	sonam	m	O
11	43	Annaba	m	O
12	45	Bejaefa	m	O
13	48	Medea	m	O
14	49	Djelfa	m	O
15	50	Tipaza	m	O
16	51	Bechar	m	O
17	54	Mostag	m	O
18	55	Tiaret	m	O
19	56	Bouira	m	O
20	59	Tebessa	m	O
21	61	Harrach	m	O
22	62	Mila	m	O
23	65	Fouka	m	O
24	66	El Eulma	m	O
25	68	Abbes	m	O
26	69	Jijel	m	O
27	70	Guelma	m	O
28	85	Khechna	m	O
29	87	Kiffan	m	O
30	88	Lakhdaria	m	O
31	6	Maputo	m	D
32	12	Lichinga	m	D
33	15	Garcia	m	D
34	19	Accra	m	D
35	27	Wa	m	D
36	28	Navrongo	m	D
37	37	Mascara	m	D
38	44	Batna	m	D
39	57	El Biar	m	D
40	60	Boufarik	m	D
41	63	Oued	m	D
42	64	Ahras	m	D
43	71	Befda	m	D
44	86	Birtouta	m	D
45	18	Takoradi	m	C
46	22	Cape Coast	m	C
47	29	Kwabeng	m	C
48	30	Algiers	m	C
49	31	Laghouat	m	C
50	39	Relizane	m	C
51	52	Setif	m	C
52	53	Biskra	m	C
53	67	Kolea	m	C
54	100	AefnFakroun	m	C
55	26	Nima	m	B
56	32	TiziOuzou	m	B
57	33	Chlef	m	B
58	89	M'sila	m	A
59	96	Heliopolis	m	A
60	97	Berrouaghia	m	A
61	98	Sougueur	m	A
62	3	Maun	f	O
63	7	Tete	f	O
64	9	Chimoio	f	O
65	11	Pemba	f	O
66	14	Chibuto	f	O
67	25	Mampong	f	O
68	36	Tlemcen	f	O
69	40	Adrar	f	O
70	41	Tindouf	f	O
71	46	Skikda	f	O
72	47	Ouargla	f	O
73	10	Matola	f	D
74	20	Legon	f	D
75	21	Sunyani	f	D
76	72	Teenas	f	D
77	73	Kouba	f	D
78	75	HussenDey	f	D
79	77	Khenchela	f	D
80	82	HassiBahbah	f	D
81	84	Baraki	f	D
82	91	Boudouaou	f	D
83	95	Tadjenanet	f	D
84	4	Molepolole	f	C
85	8	Quelimane	f	C
86	23	Bolgatanga	f	C
87	58	Mohammadia	f	C
88	83	Merouana	f	C
89	24	Ashaiman	f	B
90	76	N'gaous	f	B
91	90	Oued	f	B
92	92	BordjMenael	f	B
93	93	Boukhari	f	B
94	74	Reghaa	f	A
95	78	Cheria	f	A
96	79	Mouzaa	f	A
97	80	Meskiana	f	A
98	81	Miliana	f	A
99	94	Sig	f	A
100	99	Kadiria	f	A

H0: The performance of girl students is same as boy students.
H1: The performance of boy and girl students are different.

Open Excel Workbook

	O	A	B	C	D	total	sum{[(Oi-Ei)^2]/Ei}
girls	11	7	5	5	11	39	6.074863267
boys	30	4	3	10	14	61	6.074863267
total	41	11	8	15	25	100	12.14972653
Ei	20.5	5.5	4	7.5	12.5	50	

To prepare a contingency table as shown above.To calculate Girls Std with “O” Grade
Go to Cell H2 and type =COUNTIFS(D2:D101,"f",E2:E101,"O")
To calculate Girls Students with “A” Grade
Go to Cell I2 and type =COUNTIFS(D2:D101,"f",E2:E101,"A")
To calculate Girls Students with “B” Grade
Go to Cell J2 and type =COUNTIFS(D2:D101,"f",E2:E101,"B")
To calculate Girls Students with “C” Grade
Go to Cell K2 and type =COUNTIFS(D2:D101,"f",E2:E101,"C")
To calculate Girls Students with “D” Grade
Go to Cell L2 and type =COUNTIFS(D2:D101,"m",E2:E101,"D")

To calculate Boys Students with “O” Grade
Go to Cell H3 and type =COUNTIFS(D2:D101,"m",E2:E101,"O")
To calculate Boys Students with “A” Grade
Go to Cell I3 and type =COUNTIFS(D2:D101,"m",E2:E101,"A")
To calculate Boys Students with “B” Grade
Go to Cell J3 and type =COUNTIFS(D2:D101,"m",E2:E101,"B")
To calculate Boys Students with “C” Grade
Go to Cell K3 and type =COUNTIFS(D2:D101,"m",E2:E101,"C")
To calculate Boys Students with “D” Grade
Go to Cell L3 and type =COUNTIFS(D2:D101,"m",E2:E101,"D")
Use AutoSum to get total values.

To calculate Ei
On H5 type =H4/2 On I5 type =I4/2 On J5 type =J4/2 On K5 type =K4/2 On L5 type =L4/2 On M5 type =M4/2
Now calculate “sum{[(Oi-Ei)^2]/Ei}”
Go to cell N2 and type
=SUM((H2-H5)^2/H5,(I2-I5)^2/I5,(J2-J5)^2/J5,(K2-K5)^2/K5,(L2-L5)^2/L5)
Go to cell N3 and type
=SUM((H3-H5)^2/H5,(I3-I5)^2/I5,(J3-J5)^2/J5,(K3-K5)^2/K5,(L3-L5)^2/L5)
To get the table value go to cell N7 and type =CHIINV(0.05,4)
Go to cell N8 and type =IF(N4>=N7," H0 is Accepted", "H0 is Rejected")

Output: