THE PUBLIC ACCOUNTANTS EXAMINATIONS BOARD

A Committee of the Council of ICPAU

CPA(U) EXAMINATIONS

LEVEL ONE

QUANTITATIVE TECHNIQUES - PAPER 2

TUESDAY 5 OCTOBER, 2021

INSTRUCTIONS TO CANDIDATES

1. Time allowed: **3 hours 15 minutes**.
   The first 15 minutes of this examination have been designated for reading time. You may not start to write your answer during this time.
2. This examination contains **six** questions and only **five** questions are to be attempted. Each question carries 20 marks.
3. Formulae and tables are provided on pages 8 – 13.
4. Write your answer to each question on a fresh page in your answer booklet.
5. Please, read further instructions on the question paper and answer booklet, before attempting any question.

Attempt five of the six questions.

Question 1

(a) Distinguish between bimodal distribution and bivariate distribution giving an illustration in each case.

(4 marks)

(b) The table below shows the cumulate frequency of time a patient has to wait in a queue before he /she can be called in to see a doctor in a busy hospital.

Waiting time in minutes	Number of patients
49.5 - 59.5	1
59.5 - 69.5	3
69.5 - 79.5	11
79.5 -89.5	29
89.5 - 99.5	52
99.5- 109.5	73
109.5 - 119.5	88
119.5 - 129.5	97
129.5 - 139.5	100

(i) Re-construct a frequency table for the above data and present the data on a histogram. Hence estimate the mode.

(6 marks)

(ii) Calculate the variance for the above data.

(8 marks)

(iii) Using the relationship between mean, mode and median determine the median.

(2 marks)

(Total 20 marks)

Question 2

(a) In April 2019, a multiple choice aptitude test consisting of 200 questions, each question with 4 possible answers of which only one was correct was administered by public service in order to short list applicants for the advertised jobs.

Required:

Find the probability that sheer guess work yielded 25 to 30 correct answers for 80 of the 200 questions which applicants had no knowledge about.

(7 marks)

(b) During a scout's camp at Kazi camping site, participants were required to parade in groups.

Required:

In how many ways can a group of 5 scouts be selected from 9 members if two particular members from the 9 cannot be in the same group?

(4 marks)

(c) A discrete random variable X has a probability distribution indicated in the following table.

X	1	2	3	4	5	6	7
$P(X)$	k	$2k$	$2k$	$3k$	k^2	$7k^2$	$2k^2+k$

Required:

(i) Find the value of k **(4 marks)**

(ii) $E(X)$ **(2 marks)**

(iii) $P(X \geq 4)$ **(3 marks)**

(Total 20 marks)

Question 3

(a) The Chairperson of the Public Accountants Examinations Board at ICPAU believes that gender is independent of performance in the accounting profession. To confirm this belief, a random sample was taken comprising of 200 males and 160 females who had completed the CPA course. The results are summarised in the following table.

	Male.	Female
Distinction	18.5 %	27.5 %
Merit	63.5 %	60.0 %
Unsatisfactory	18.0 %	12.5 %

Required:

(i) State the hypothesis you would apply to examine the validity of this belief.

(4 marks)

(ii) Test the Chairperson's belief at 5 % level of significance.

(8 marks)

(b) At a beverage factory, 100ml bottles are cocked every 5 minutes. To ensure that the process works properly, a summary of five samples with 4 observations each was taken and the results recorded as shown below:

Sample					Mean $(\bar{x})$	Range (R)
1	102	99	98	101	100	4
2	103	98	99	104	101	6
3	97	99	99	101	99	4
4	99	103	101	105	102	6
5	98	102	103	97	100	6

Required:

(i) Compute the mean of the means ($\bar{\bar{x}}$) and the mean of the ranges $\bar{R}$.

(2 marks)

(ii) Given the values of $A_2 = 0.729$, $D_4 = 2.282$ and $D_3 = 0$, determine the upper and lower control limit of the mean and range respectively.

(6 marks)

(Total 20 marks)

Question 4

(a) Porombo Crude Waragi Distillers Ltd distils crude waragi to refine it for sale to the public. The following data has been obtained concerning the time (in minutes) required to inspect batches of crude waragi and the quantity (in mg) of toxic substances obtained therein.

Quantity (x)	17	9	12	7	8	10	14	18	19	6
Time (y)	48	50	43	36	45	49	55	63	55	36

The data in the table is summarised as follows: $\sum x = 120$, $\sum y = 480$, $\sum xy = 6049$, $\sum x^2 = 1644$, $\sum y^2 = 23690$,

Required:

Illustrate the above data on a scatter graph.

(4 marks)

(b) Determine the:

(i) Coefficient of correlation between x and y and comment on the result.

(4 marks)

(ii) Values of a and b of regression equation that approximates the trend in the form $y = a + bx$. Hence plot the trend line on the scatter graph.

(6 marks)

(iii) Inspection time required to determine 20mg of toxins.

(2 marks)

(c) Distinguish between cyclic and seasonal variations in time series.

(4 marks)

(Total 20 marks)

Question 5

(a) Two factories located in Katwe (a suburb in Kampala) are engaged in the production of maize flour. Factory A has a production function, $P(q) = 2q^2 + 5q$ and factory B has a production function $P(q) = q^2 + 4q + 12$ where q is the quantity of maize used (in metric tons). On 5 February 2021, the two factories produced the same quantity of maize flour.

Required:

Find the amount of maize flour that was produced on that day.

(5 marks)

(b) Rukundo Egumeho is an enterprise specialised in the production of local wine. The cost of producing Q units per day is given by a cost function, $C(Q) = \frac{1}{3}Q^3 - 20Q^2 + 600Q + 1000$ while the revenue is defined by the function $R(Q) = 420Q - 2Q^2$ where C and R are in thousands of shillings.

Required:

(i) Determine the output that maximises profit. **(7 marks)**
(ii) Cost incurred to gain this profit. **(2 marks)**

(c) The following table relates to the expenditure of a family in a slum area.

Items	Weight	Base year prices (Shs "000")	Current year prices. (Shs "000")
Food	10	1,500	2,250
House rent	5	5,000	15,000
Clothing	2	3,000	6,000
Fuel	3	3,000	7,500
Others	5	5,000	7,500

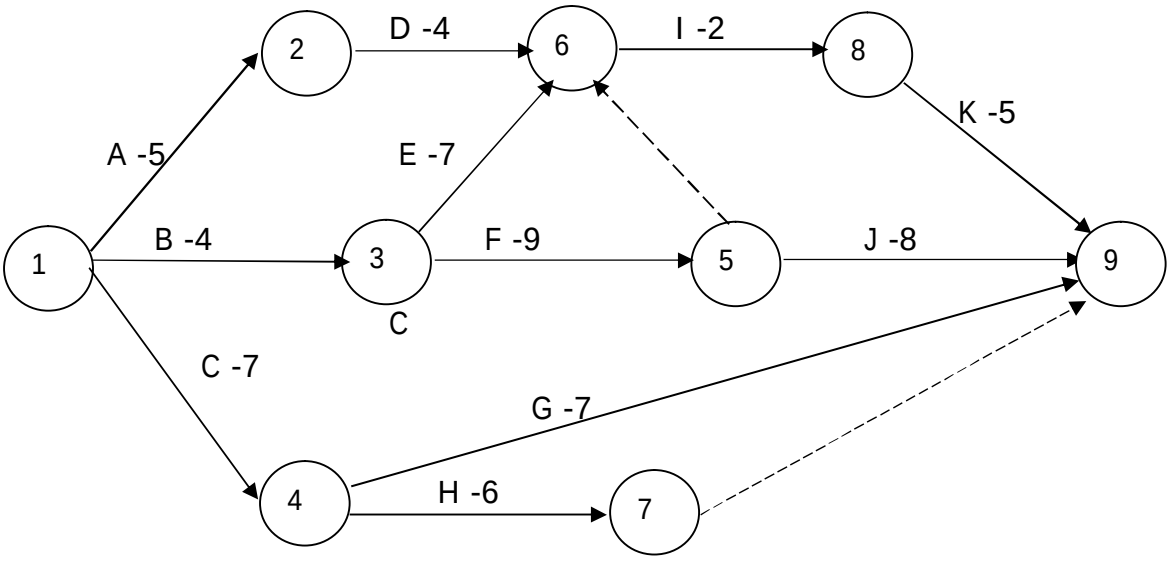
Required:

Compute the cost of living under such conditions.

(6 marks)
(Total 20 marks)

Question 6

(a) A project is modelled by activity network in the diagram below. The activities and their duration are represented by arcs. The numbers in the circle nodes are event numbers. Each activity requires one work and activity duration are in hours.



Required:

(i) Explain the significance of the dummy activities from event 5 to event 6 and from event 7 to event 9.

(2 marks)

(ii) Re-draw the network diagram and clearly indicate the early and latest start times in each event.

(5 marks)

(iii) Obtain the minimum project completion time using your network diagram in (ii) above.

(1 mark)

(b) A firm produces three articles A, B, C in two factories. For each 100 employees at the first factory, the weekly production is 100 units of A, 200 units of B, 500 units of C, while the corresponding figures for the second factory are 500 units of A, 300 units of B, 200 units of C. To fulfil its orders the firm must produce each week 1,000 units of A, 1,300 units of B, 1600 units of C or more. If the total available labour force is 1,000 and if each employee is paid Shs 80,000 and Shs 40,000 per week at the first factory and the second factory respectively,

Required:

(i) Express the above information as a linear programming problem.

(5 marks)

(ii) Graphically determine how many men should be employed at each factory if the firm intends to minimise total costs.

(7 marks)

(Total 20 marks)

1.	Combination ${}^{n}C_{r} = \frac{n!}{(n-r)!r!}$			
2.	Permutations ${}^{n}p_{r} = \frac{n!}{(n-r)!}$			
3.	Mean of the binomial distribution = np			
4.	Standard deviation = $\sqrt{npq}$			
5.	Variance of the binomial distribution = $np(1-p)$			
6.	Standard error of population proportion $S_{ps} = \sqrt{\frac{pq}{n}}$			
7.	Spearman's rank correlation coefficient $r = 1 - \frac{6\sum d^2}{n(n^2-1)}$			
8.	Product moment coefficient of correlation = $\frac{n\sum xy - \sum x \sum y}{\sqrt{(n\sum x^2 - (\sum x)^2) \times (n\sum y^2 - (\sum y)^2)}}$			
9.	Cost slope	=	crash cost – normal cost / normal time – crash time	
10.	Harmonic mean (ungrouped data) $hm = \frac{n}{\sum \frac{1}{x}}$			
11.	Sample mean	$\bar{x} = \frac{\sum x}{n}$		
12.	Harmonic mean (grouped data) $hm = \frac{n}{\sum \frac{f}{x}}$			
13.	Quartile coefficient of dispersion = $\frac{Q_3 - Q_1}{Q_3 + Q_1}$			
14.	Bowley's coefficient of skeweness = $\frac{Q_3 + Q_1 - 2Q_2}{Q_{3-}Q_1}$			
15.	Mean $\bar{x} = A + \frac{\sum fd}{\sum f}$	or	Mean $\bar{x} = \frac{\sum fx}{\sum f}$	

16.	Median $= Lb + \left(\frac{\frac{N}{2} - Cfb}{fm} \right) C$				
17.	Mode $= lm + \left(\frac{d_1}{d_1 + d_2} \right) C$				
18.	Variance $Var(x) = \frac{\sum fx^2}{\sum f} - \left(\frac{\sum fx}{\sum f} \right)^2$				
19.	Standard deviation	$\delta = \sqrt{\frac{\sum fx^2}{\sum f} - \bar{x}^2}$		$= \sqrt{\frac{\sum f(x-\bar{x})^2}{\sum f}}$	
20.	Sample standard deviation	$s = \sqrt{\frac{\sum (x-\bar{x})^2}{n-1}}$			
21.	Least squares regression equation of y on x is given by; $y = a + bx$				
	Where; $b = \frac{n\sum xy - \sum x \sum y}{n\sum x^2 - \left(\sum x\right)^2}$		and	$a = \frac{\sum y}{n} - \frac{b\sum x}{n}$	
22.	Least squares regression equation of x on y is given by; x = c +dy				
	Where $c = \frac{\sum x}{n} - \frac{d\sum y}{n}$		and	$d = \frac{n\sum xy - \sum x \sum y}{n\sum y^2 - (\sum y)^2}$	
23.	Standardising normal.			$z = \frac{\bar{x} - \mu}{\sigma}$	
24.	Central Limit theorem			$\frac{\overline{x - x_2}}{\sqrt{\frac{\sigma_1^2 + \sigma_2^2}{n_1 + n_2}}}$	
24.	Confidence interval for sample mean $= \bar{x} \pm t_{\alpha/2} \frac{s}{\sqrt{n}}$				
25.	$\chi^2 = \sum \frac{(O-E)^2}{E}$				
26.	Confidence interval of proportion $= p \pm z_{\alpha/2} \sqrt{\frac{pq}{n}}$				
27.	Pearson coefficient of skewness	$Sk = \frac{(\bar{x} - \text{mode})}{s_d}$	o r	$Sk = \frac{3\left(\bar{x} - median\right)}{s_d}$	
28.	Expectation = $\sum xP(X = x)$				

29.	Laspeyres' price index = $\frac{\sum(p_1 \times q_0)}{\sum(q_0 \times p_0)} \times 100$
30.	Paasche's Model = $\frac{\sum(p_1 \times q_1)}{\sum(q_1 \times p_0)} \times 100$
31.	Weighted aggregate price index $= \frac{\sum wv_n}{\sum wv_0} \times 100$
32.	Additive law of probability; $P(A \cup B) = P(A) + P(B) - P(A \cap B)$
33.	Conditional probability $P\left(A/B\right) = \frac{P(A \cap B)}{P(B)}$
34.	Independence of A, B $P\left(A/B\right) = P(A) or P(A \cap B) = P(A) \times P(B)$
35.	Continuous compounding $A = P(1+r)^n + \frac{b(1+r)^n - b}{r}$
36.	Quotient rule of differentiation $f = \frac{vu^1 - uv^1}{v^2}$; where $f = \frac{u}{v}$
37.	$Poisson Model P\left(X = x\right) = e^{-\lambda} \frac{\lambda^x}{x!}$
38.	Extrapolation $y_x = y_1 + (y_2 - y_1)(\frac{x - x_1}{x_2 - x_1})$
39.	Interpolation $y_x = y_1 + (x - x_1)(\frac{y_2 - y_1}{x_2 - x_1})$

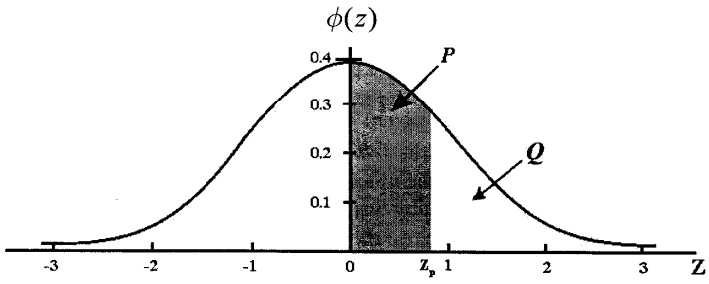
CUMULATIVE NORMAL DISTRIBUTION $P(z)$

Z	0	1	2	3	4	5	6	7	8	9	ADD 1	2	3	4	5	6	7	8	9
0.0	0.0000	0040	0080	0120	0160	0199	0239	0279	0319	0359	4	8	12	16	20	24	28	32	36
0.1	0.0398	0438	0478	0517	0557	0596	0636	0675	0714	0753	4	8	12	16	20	24	28	32	36
0.2	0.0793	0832	0871	0910	0948	0987	1026	1064	1103	1141	4	8	12	15	19	22	27	31	35
0.3	0.1179	1217	1255	1293	1331	1368	1406	1443	1480	1517	4	8	11	15	19	22	26	30	34
0.4	0.1554	1591	1628	1664	1700	1736	1772	1808	1844	1879	4	7	11	14	18	22	25	29	32
0.5	0.1915	1950	1985	2019	2054	2088	2123	2157	2190	2224	3	7	10	14	17	21	24	27	31
0.6	0.2257	2291	2324	2357	2389	2422	2454	2486	2517	2549	3	6	10	13	16	19	23	26	29
0.7	0.2580	2611	2642	2673							3	6	9	12	15	19	22	25	28
					2704	2734	2764	2794	2823	2852	3	6	9	12	15	18	21	24	27
0.8	0.2881	2910	2939	2967	2995	3023					3	6	8	11	14	17	20	22	25
							3051	3078	3106	3133	3	5	8	11	13	16	19	22	24
0.9	0.3159	3186	3212	3238	3264	3289					3	5	8	10	13	16	18	21	23
							3315	3340	3365	3389	2	5	7	10	12	15	17	20	22
1.0	0.3413	3438	3461	3485	3508						2	5	7	10	12	14	17	19	22
						3531	3554	3577	3599	3621	2	4	7	9	11	13	15	18	20
1.1	0.3643	3665	3686	3708							2	4	6	8	11	13	15	17	19
					3729	3749	3770	3790	3810	3830	2	4	6	8	10	12	14	16	18
1.2	0.3849	3869	3888	3907	3925						2	4	6	8	10	11	13	15	17
						3944	3962	3980	3997	4015	2	4	5	7	9	11	13	14	16
1.3	0.4032	4049	4066	4082	4099	4115	4131	4147	4162	4177	2	3	5	6	8	10	11	13	14
1.4	0.4192	4207	4222	4236	4251	4265	4279	4292	4306	4319	1	3	4	6	7	8	10	11	13
1.5	0.4332	4345	4357	4370	4382	4394	4406	4418	4429	4441	1	2	4	5	6	7	8	10	11
1.6	0.4452	4463	4474	4484	4495	4505	4515	4525	4535	4545	1	2	3	4	5	6	7	8	9
1.7	0.4554	4564	4573	4582	4591	4599	4608	4616	4625	4633	1	2	3	3	4	5	6	7	8
1.8	0.4641	4649	4656	4664	4671	4678	4686	4693	4699	4706	1	1	2	3	4	4	5	6	6
1.9	0.4713	4719	4726	4732	4738	4744	4750	4756	4761	4767	1	1	2	2	3	4	4	5	5
2.0	0.4772	4778	4783	4788	4793	4798	4803	4808	4812	4817	0	1	1	2	2	3	3	4	4
2.1	0.4821	4826	4830	4834	4838	4842	4846	4850	4854	4957	0	1	1	2	2	2	3	3	4
2.2	0.4861	4864	4868	4871	4875	4878	4881	4884	4887	4890	0	1	1	1	2	2	2	3	3
2.3	0.4893	4896	4898	4901	4904	4906	4909	4911	4913	4916	0	0	1	1	1	2	2	2	2
2.4	0.4918	4920	4922	4925	4927	4929	4931	4932	4934	4936	0	0	1	1	1	1	1	2	2
2.5	0.4938	4940	4941	4943	4945	4946	4948	4949	4951	4952									
2.6	0.4953	4955	4956	4957	4959	4960	4961	4962	4963	4964									
2.7	0.4965	4966	4967	4968	4969	4970	4971	4972	4973	4974									
2.8	0.4974	4975	4976	4977	4977	4978	4979	4979	4980	4981									
2.9	0.4981	4982	4982	4983	4984	4984	4985	4985	4986	4986									
3.0	0.4987	4990	4993	4995	4997	4998	4998	4999	4999	5000									

The table gives $P(z) = \int_0^z \phi(z)dz$

If the random variable Z is distributed as the standard normal distribution N(0,1) then:

1. $P(\text{o} < Z < z_p) = P(\text{Shaded Area})$
2. $P(Z > Z_p) = Q = ½ - P$
3. $P(Z^* > |Z_p|) = 1 - 2P = 2Q$



PERCENTAGE POINTS OF THE CHI-SQUARE (χ^2) DISTRIBUTION χ^2_Q

	Probability Q									
ν	**0.995**	**0.990**	**0.975**	**0.950**	**0.100**	**0.050**	**0.025**	**0.010**	**0.005**	**0.001**
1	0.0^4393	0.0^3157	0.0^3982	0.0^2393	2.706	3.841	5.024	6.635	7.879	10.83
2	0.0100	0.0201	0.0506	0.1026	4.605	5.991	7.378	9.210	10.60	13.82
3	0.0717	0.1148	0.2158	0.3518	6.251	7.815	9.348	11.34	12.84	16.27
4	0.2070	0.2971	0.4844	0.7107	7.779	9.488	11.14	13.28	14.86	18.47
5	0.4117	0.5543	0.8312	1.145	9.236	11.07	12.83	15.09	16.75	20.52
6	0.6757	0.8721	1.237	1.635	10.64	12.59	14.45	16.81	18.55	22.46
7	0.9893	1.239	1.690	2.167	12.02	14.07	16.01	18.48	20.28	24.32
8	1.344	1.646	2.180	2.733	13.36	15.51	17.53	20.09	21.95	26.12
9	1.735	2.088	2.700	3.325	14.68	16.92	19.02	21.67	23.59	27.88
10	2.156	2.558	3.247	3.940	15.99	18.31	20.48	23.21	25.19	29.59
11	2.603	3.053	3.816	4.575	17.28	19.68	21.92	24.73	26.76	31.26
12	3.074	3.571	4.404	5.226	18.55	21.03	23.34	26.22	28.30	32.91
13	3.565	4.107	5.009	5.892	19.81	22.36	24.74	27.69	29.82	34.53
14	4.075	4.660	5.629	6.571	21.06	23.68	26.12	29.14	31.32	36.12
15	4.601	5.229	6.262	7.261	22.31	25.00	27.49	30.58	32.80	37.70
16	5.142	5.812	6.908	7.962	23.54	26.30	28.85	32.00	34.27	39.25
17	5.697	6.408	7.564	8.672	24.77	27.59	30.19	33.41	35.72	40.79
18	6.265	7.015	8.231	9.390	25.99	28.87	31.53	34.81	37.16	42.31
19	6.844	7.633	8.907	10.12	27.20	30.14	32.85	36.19	38.58	43.82
20	7.434	8.260	9.591	10.85	28.41	31.41	34.17	37.57	40.00	45.31
21	8.034	8.897	10.28	11.59	29.62	32.67	35.48	38.93	41.40	46.80
22	8.643	9.542	10.98	12.34	30.81	33.92	36.78	40.29	42.80	48.27
23	9.260	10.20	11.69	13.09	32.01	35.17	38.08	41.64	44.18	49.73
24	9.886	10.86	12.40	13.85	33.20	36.42	39.36	42.98	45.56	51.18
25	10.52	11.52	13.12	14.61	34.38	37.65	40.65	44.31	46.93	52.62
26	11.16	12.20	13.84	15.38	35.56	38.89	41.92	45.64	48.29	54.05
27	11.81	12.88	14.57	16.15	36.74	40.11	43.19	46.96	49.64	55.48
28	12.46	13.56	15.31	16.93	37.92	41.34	44.46	48.28	50.99	56.89
29	13.12	14.26	16.05	17.71	39.09	42.56	45.72	49.59	52.34	58.30
30	13.79	14.95	16.79	18.49	40.26	43.77	46.98	50.89	53.67	59.70
40	20.71	22.16	24.43	26.51	51.81	55.76	59.34	63.69	66.77	73.40
50	27.99	29.71	32.36	34.76	63.17	67.50	71.42	76.15	79.49	86.66
60	35.53	37.48	40.48	43.19	74.40	79.08	83.30	88.38	91.95	99.61
70	43.28	45.44	48.76	51.74	85.53	90.53	95.02	100.4	104.2	112.3
80	51.17	53.54	57.15	60.39	96.58	101.9	106.6	112.3	116.3	124.8
90	59.20	61.75	65.65	69.13	107.6	113.1	118.1	124.1	128.3	137.2
100	67.33	70.06	74.22	77.93	118.5	124.3	129.6	135.8	140.2	149.4

The function tabulated is χ^2_Q defined by

$$\int_{\chi^2_Q}^{\infty} f(x)dx = Q; \quad f(x) = \frac{1}{2^{\nu/2}(\frac{1}{2}\nu - 1)!} x^{\nu/2-1} e^{-x/2} (x > 0)$$

where $f(x)$ is the probability density of the χ^2 distribution for ν degrees of freedom. Interpolation ν-wise for $\nu > 30$ gives adequate values (but errors up to 5 units in the last figure may occur for the smaller ν). For $\nu > 100$ the distribution of $\sqrt{(2\chi^2)}$ is approximately normal with mean $\sqrt{(2\nu - 1)}$ and unit variance.

Note: $0.0^4 2 = 0.00002$
$0.0^3 3 = 0.0003$
$0.0^2 4 = 0.004$

PERCENTAGE POINTS OF STUDENT'S t – DISTRIBUTION t_Q

	Probability*									
ν	0.25	0.10	0.05	0.025	0.01	0.005	0.0025	0.001	0.0005	Q
	0.50	0.20	0.10	0.050	0.02	0.010	0.0050	0.002	0.0010	$2Q$
1	1.000	3.078	6.314	12.71	31.82	63.66	127.3	318.3	636.6	
2	0.816	1.886	2.920	4.303	6.965	9.925	14.09	22.33	31.60	
3	0.765	1.638	2.353	3.182	4.541	5.841	7.453	10.21	12.92	
4	0.741	1.533	2.132	2.776	3.747	4.604	5.598	7.173	8.610	
5	0.727	1.476	2.015	2.571	3.365	4.032	4.773	5.893	6.869	
6	0.718	1.440	1.943	2.447	3.143	3.707	4.317	5.208	5.959	
7	0.711	1.415	1.895	2.365	2.998	3.499	4.029	4.785	5.408	
8	0.706	1.397	1.860	2.306	2.896	3.355	3.833	4.501	5.041	
9	0.703	1.383	1.833	2.262	2.821	3.250	3.690	4.297	4.781	
10	0.700	1.372	1.812	2.228	2.764	3.169	3.581	4.144	4.587	
11	0.697	1.363	1.796	2.201	2.718	3.106	3.497	4.025	4.437	
12	0.695	1.356	1.782	2.179	2.681	3.055	3.428	3.930	4.318	
13	0.694	1.350	1.771	2.160	2.650	3.012	3.372	3.852	4.221	
14	0.692	1.345	1.761	2.145	2.624	2.977	3.326	3.787	4.140	
15	0.691	1.341	1.753	2.131	2.602	2.947	3.286	3.733	4.073	
16	0.690	1.337	1.746	2.120	2.583	2.921	3.252	3.686	4.015	
17	0.689	1.333	1.740	2.110	2.567	2.898	3.222	3.646	3.965	
18	0.688	1.330	1.734	2.101	2.552	2.878	3.197	3.610	3.922	
19	0.688	1.328	1.729	2.093	2.539	2.861	3.174	3.579	3.883	
20	0.687	1.325	1.725	2.086	2.528	2.845	3.153	3.552	3.850	
21	0.686	1.323	1.721	2.080	2.518	2.831	3.135	3.527	3.819	
22	0.686	1.321	1.717	2.074	2.508	2.819	3.119	3.505	3.792	
23	0.685	1.319	1.714	2.069	2.500	2.807	3.104	3.485	3.767	
24	0.685	1.318	1.711	2.064	2.492	2.797	3.091	3.467	3.745	
25	0.684	1.316	1.708	2.060	2.485	2.787	3.078	3.450	3.725	
26	0.684	1.315	1.706	2.056	2.479	2.779	3.067	3.435	3.707	
27	0.684	1.314	1.703	2.052	2.473	2.771	3.057	3.421	3.690	$\frac{120}{\nu}$
28	0.683	1.313	1.701	2.048	2.467	2.763	3.047	3.408	3.674	
29	0.683	1.311	1.699	2.045	2.462	2.756	3.038	3.396	3.659	
30	0.683	1.310	1.697	2.042	2.457	2.750	3.030	3.385	3.646	4
40	0.681	1.303	1.684	2.021	2.423	2.704	2.971	3.307	3.551	3
60	0.679	1.296	1.671	2.000	2.390	2.660	2.915	3.232	3.460	2
120	0.677	1.289	1.658	1.980	2.358	2.617	2.860	3.160	3.373	1
∞	0.674	1.282	1.645	1.960	2.326	2.576	2.807	3.090	3.291	0

The function tabulated is t_Q defined by

$$\int_{t_Q}^{\infty} f(t)dt = Q; \quad f(t) = \frac{(\frac{1}{2}\nu - \frac{1}{2})!}{\sqrt{(\nu\pi)(\frac{1}{2}\nu - 1)!}} \cdot \frac{1}{(1 + t^2/\nu)^{(\nu+1)/2}}$$

where $f(t)$ is the probability density of the t-distribution.
Interpolation ν-wise should be linear in $120/\nu$ for $\nu > 30$.
Use (i) upper row for one tail-tests
(i) lower row for two tail-tests
If x is a random variable with the t-probability distribution for ν degrees of freedom, the probability that $x > t_Q$ is Q and the probability that $|x| > t_Q$ is 2Q.
The graph shows the form of the distribution for $\nu = 2$. The shaded area represents the probability Q. For large ν the distribution approximates to the normal distribution N(0,1), shown by the dotted line.