



CERTIFIED PUBLIC ACCOUNTANT

FOUNDATION 1 EXAMINATION

F1.1: BUSINESS MATHEMATICS AND QUANTITATIVE METHODS

MONDAY: 6 JUNE 2016

INSTRUCTIONS:

- 1. Time Allowed: 3 hours 15 minutes (15 minutes reading and 3hours writing).
- 2. This examination has **seven** questions and only **five** questions are to be attempted.
- 3. Marks allocated to each question are shown at the end of the question.
- 4. Show all your workings, where applicable.

QUESTION ONE

a) The CEO of Kigali Publishing Company Ltd has to make a decision whether to accept an offer for a copyright of Frw 1,240,000 for three years from Tafu Book Sellers Ltd or one from Bako Book Sellers Ltd offering Frw 1,600,000 for five years.

Required:

- (i) Calculate the present value of each option if the interest rate is fixed at 9% over the lifetime of the agreement. (6 Marks)
- (ii) Advise the CEO on which option to accept.

(2 Marks)

b) Kirehe Plastics Limited has bought a new machine for its plastic molding line for Frw 750,000. This machine is expected to have a useful life of seven years with a scrap value of Frw 102,041.

Required:

(i) Using the straight line method, determine the annual depreciation.

(3 Marks)

- (ii) Using the reducing balance method, determine the:
 - Value of the asset after nine years, if the rate of the depreciation is compounded at 14 % per annum. (4 Marks)
 - Rate of depreciation required to give a depreciated value of Frw 204,081.6 after nine years. (5 Marks)

(Total 20 Marks)

QUESTION TWO

(a) Explain any four major uses of statistics.

(4 Marks)

(b) Rutagengwa Accountancy Training Institute is set to open in Rwamagana District. In a bid to understand the trend in performance in one of the core subjects, the management obtained the following data from a sister institute:

Marks	Number of candidates
0≤x≤10	I ICPAR ICPAR ICPAR ICPAR ICI I ICPAR ICPAR ICPAR ICPAR ICI
10≤x≤20	L ICPAR ICPAR ICPAR ISAR ICPAR ICI L ICPAR ICPAR ICPAR ICI
20≤x≤30	icpar icpar icpar 30 ar icpar ici
30≤x≤40	icpar icpar icpar 26 ar icpar ici
40≤x≤50	icpar icpar icpar 25 ar icpar ici
50≤x≤60	I ICPAR ICPAR ICPAR 18 AR ICPAR ICI
60≤x≤70	I ICPAR ICPAR ICPAR 2PAR ICPAR ICI

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Required:

- (i) Construct a cumulative frequency curve for the performance above. (6 Marks)
- (ii) Use the curve in b (i) above and use it to estimate the median mark, upper quartile and the lower quartile. (4 Marks)
- (iii) Determine the semi-interquartile range.

(2 Marks)

(c) A researcher, after completing one of his experiments, established that for (n) observations of a random variable, X, $\sum x^2=1200$, $\overline{X}=\sqrt{50}$ and the standard deviation of X was $\sqrt{10}$.

Required:

Determine the value of (n).

(4 Marks)

(Total 20 Marks)

QUESTION THREE

Using examples, distinguish between discrete and continuous data.

(2 Marks)

(a) The attendance at Kivu Night Club follows a normal distribution, with a mean of 120 people and standard deviation of 18 people.

Required:

Calculate the probability that on a given night:

(i) 92 people or more attend.

(5 Marks)

(ii) Between 101 and 122 people attend.

(5 Marks)

(b) The probability of a faulty call on hotline for an ambulance is 0.003. If 1,000 calls are made on a given day, calculate the probability of there being less than five faulty calls on any one day. (8 Marks)

Hint: Use a Poisson distribution.

(Total 20 Marks)

QUESTION FOUR

- (a) (i) Clearly distinguish between a sampling frame and sampling design. (2 Marks)
 - (ii) Response and non-response forms of bias affect conclusions drawn from sample survey. Explain how the two occur in a sample survey. (2 Marks)
- (b) In a recent survey financed by Ministry of youth and sports, respondents were asked "Is it proper for a husband in a marriage to refuse to have more children when his wife still wants do so?"

Of the 598 respondents asked, 366 said (YES) and 232 said (NO). Assuming the sample was randomly selected.

Required:

- (i) Determine the 99% confidence interval for the population proportion who said YES. (6 Marks)
- (ii) Determine the 95% confidence interval for those who said NO.

(3 Marks)

(iii) Compare the results in (i) and (ii) above.

(1 Mark)

(c) Urusaro Distilled Water Battery Dealers Ltd produces distilled water for motor boat batteries. In their current advertisement, they claim that their distilled water lasts 20,000 km on average in a motor boat battery.

Angel Fishing Company (AFC) requires distilled water for their motor boat batteries. AFC has decided to test 16 sets of their batteries with distilled water from Urusaro Distilled Water Battery Dealers Ltd. They have established that the distilled water runs for 19,500 km with a standard deviation of 1,200 km.

Required:

Test Urusaro Distilled Water Battery Dealers Ltd's claim against AFC's requirement at 5% level of significance. (6 Marks)

(Total 20 Marks)

QUESTION FIVE

(a) Distinguish between correlation coefficient and coefficient of determination.

(2 Marks)

(b) Outline any three components of a time series.

(3 Marks)

(c) The table below shows a sample of ten steel rods whose lengths (cm) and weights (gm) were taken from a factory.

Length(1)	56	35	54	42	37	51	38	55	46	44
Weight(w)	55	30	52	42	32	50	39	46	31	42

Required:

Calculate the Spearman's coefficient of correlation between the length and the weight. (6 Marks)

(d) The table below shows data of KIVU Fish Processing Company Limited about the fish processed in (tons) and the cost of electricity in (Frw)

Output (tons), x	Cost of Electricity (Frw '000'), y
AR ICPAR ICPAR 40 AR ICPA AR ICPAR ICPAR 40 AR ICPA	RICPARICPARIC 12 PARICPARICPARICPARICPARICPARICPARICPARIC
68	RICPAR ICPAR ICPAR ICPAR ICPAR
R iCPAR iCPA 94 AR iCPA	R ICPAR ICPAR ICPAL R ICPAR ICPAR ICPAL
AR iCPAR iCPAR 75 AR iCPA AR iCPAR iCPAR iCPA	94.8 PAR ICPAR
AR iCPAR iCPAR 55 AR iCPA AR iCPAR iCPAR iCPA	LICPAR ICPAR ICPAS CPAR ICPAL
AR ICPAR ICPAR 95 AR ICPA	R ICPAR ICPAR ICP <mark>110</mark> PAR ICPAR
AR ICPAR ICPAR 82 AR ICPA	RICPAR ICPAR ICH 105 PAR ICPAR
AR ICPAR ICPA 103 R ICPA	R ICPAR ICPAR ICI1125 PAR ICPAR
ar icpar icpa 89 ar icpa	R iCPAR iCPAR iCPA1 OPAR iCPA1
AR iCPAR iCPA 1110 R iCPA	RICPARICPARICI 138 PARICPA

Required:

- (i) Calculate the least squares regression line of y on x and interpret your result. (8 Marks)
- (ii) Use your regression line in d (i) above to predict the cost of electricity at output level 115 tons. (1 Mark)

(Total 20 Marks)

QUESTION SIX

(a) Using illustrations, distinguish between a transportation problem and an assignment problem.

(6 Marks)

(b) A company that manufactures dishwashers has three factories A, B and C and four warehouses located at P, Q, R and S. The dish washers' requirements at each factory, warehouse requirements and transport costs per dishwasher to be transported are shown in the table below:

AR ICPAR ICPAR ICPAR ICPAR ICPAR ICI AR ICPAR ICPAR ICPAR ICPAR ICPAR ICI	Unit to	Factory					
Warehouse	PAR i PAR i	PAR i QAR i C PAR i QAR i C	AR ICAR ICP AR ICR	R iCPSR iCP	requirement		
Factory A	AR 19 R 1	PAR 30 R 10	AR 50	R iC 10 iCP	R iCPAR iCP 7 R iCPAR R iCPAR iCPAR iCPAR		
Factory B	AR 70	30	40	60	R iCPAR iCPAR iCPAR		
Factory C	40	PAR i SAR iC	70 T	20	R ICPAR IC18 ICPAR		
Warehouse requirement	PAR iSAR id	PAR i 8 AR iC	PAR iCPAR iCP	R i C 14 i CP	Ricparic34 icpar		

The initial feasible tableau that represents the above problem is shown below.

	ar icpar icpai r icp Unit	AR iCPA R iCPA	R iCPAR iCPAR iCPA R iCPAR iCPAR iCPA					
Warehouse	AR ICPAR ICPAI AR ICPAR ICPAI AR ICPAR ICPAI	Q 30 2		50 PAR IC		S 10		Factory requirement
Factory A CPAR CPAR CPAR CPAR CPAR CPAR CPAR CP	R19AR ICPAL AR ICPAL AR ICPAR ISAA AR ICPAR ISAA							R iCPAR iCPAR iCPA R iCPAR iCPAR iCPA R iCPAR iCPAR iCPA R iCPAR iCPAR iCPA B iCPAR iCPAR iCPA
Factory B	70 AR ICPAL R ICPAR ICPAL R ICPAR ICPAL R ICPAR ICPAL	30 CPAR	6		40 3		AR iCPA AR iCPA AR iCPA AR iCPA	R ICPAR ICPAR ICPA R ICPAR ICPAR ICPA R ICPAR ICPAR ICPA R ICPAR ICPAR ICPA
r icpar icpar icpar icpar icpar icp r icpar icpar icpar icpar icpar icp Factory C ^{(cpar icpar icpar icp}	40 AR ICPAI R ICPAR ICPAI	8 R C	ica ricpari ica ricpari icparicpari		PAR iC	20	AR iCPA AR iCPA	RICPARICPARICPA RICPARICPARICPA RICPARI18
Warehouse requirement	AR ICPAR ICPAL AR ICPAR ICPAL AR ICPAR ICPAL AR ICPAR IS	R ICPAR IC R ICPAR IC R ICPAR IC R ICPAR IC	8	CPAR IC CPAR IC CPAR IC	A4 C	HAR ICP PAR ICP PAR ICP PAR ICP	14	R ICPAR ICPAR ICPA R ICPAR ICPAR ICPA R ICPAR ICPAR ICPA R ICPAR I34 R ICPA

Required:

(i) Explain what the boxed values in the table represent.

(1 Mark)

(ii) Determine the transport cost for the allocation in the initial feasible tableau.

(2 Marks)

(c) Kigali Workshop Ltd produces two types of photo frames; landscape and portrait. Each photo frame requires cutting, assembling and vanishing. A landscape photo frame takes 20 minutes to cut to right size, 10 minutes to be assembled and 10 minutes to be vanished and on completion costs Frw 6,000. A portrait photo frame takes 10 minutes to cut to right size, 20 minutes to be assembled and 60 minutes to be vanished and on completion costs Frw 18,000. In any production run, it is necessary to schedule at least 8 hours for cutting, at least 10 hours for assembling and 18 hours for vanishing.

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Required:

- (i) Formulate a linear programming primal problem model for the problem. (3 Marks)
- (ii) Determine both the primal and dual problems for the problem. (1 Mark)
- (iii) Use simplex tableau method to determine the photo frames of each type that should be produced during one run. Hence determine the minimum cost that would be incurred. (7 Marks)

(Total 20 Marks)

QUESTION SEVEN

(a) Define the term 'critical path' in network analysis.

(2 Marks)

(b) Sons' Consult Limited was awarded a contract to construct a modern building at Gatuna boarder. The project coordinator approved the schedule of activities as shown in the table below:

CPAR Activity CPAR ICPAR	Preceding activity	Duration (weeks)
CPAR ICPAR ICPAR ICH CPAR ICPAR ICPAR ICH CPAR ICPAR AR ICHAR	iCPAR	CPAR ICPAR ICPAR ICPAR CPAR ICPAR ICPAR CPAR ICPAR ICPAR
CPAR ICPAR BAR ICPAR	iCPAR	CPAR iCPAR iCPAR iCPAR CPAR iCPAR iCPAR iCPAR
CPAR ICPAR ICPAR	iCPAR iCPAR APAR iCPAR iC	CPAR iCPAR iCPAR iCPAR
CPAR CPAR PAR CPAR	iCPAR iCPAR APAR iCPAR iC	CPAR ICPAR ICPAR
CPAR CPAR E AR CPAR	iCPAR iCPAR BPAR iCPAR iC	CPAR iCPAR i 2AR iCPAR
iCPAR iCPAR iF'AR iCPAR	iCPAR iCPAR CPAR iCPAR iC	CPAR iCPAR i 3AR iCPAR
CPAR ICPAR GAR ICPAR	iCPAR iCPAR CPAR iCPAR iC	CPAR iCPAR iCPAR iCPAR
iCPAR iCPAR iHAR iCPAR	iCPAR iCPAE (FAR iCPAR iC	CPAR iCPAR iLFAR iCPAR
iCPAR iCPAR i¶PAR iCPAR	icpar icpa d,G r icpar ic	CPAR iCPAR iC <mark>7</mark> AR iCPAR
iCPAR iCPAR i J PAR iCPAR	iCPAR iCPAH, JAR iCPAR iC	CPAR iCPAR iCPAR

Required:

(i) Draw a network for the project and state all the possible paths. (7 Marks)

CPAR iCPAR iCPAR iCP

- (ii) Determine the Earliest Start Time (EST) and the Latest Start Times (LSTs) for every activity. (8 Marks)
- (iii) Identify the critical path for the project.

(1 Mark)

(iv) Find the shortest duration of the project.

(1 Mark)

(v) Name the activities that are associated with the float in the network.

(1 Mark)

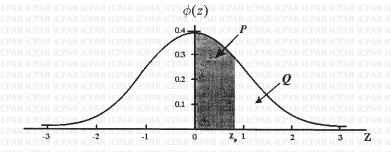
(Total 20 Marks)

End of question paper

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).2).3	0.0398		0080	0120	0160	0199	0239	0279	0319	0359	4	8	12	16	20	24	28	32	₄ 3
0.3		0438	0478	0517	0557	0596	0636	0675	0714	0753	4	8	12	16	20	24	28	32	лт3
TPP	0.0793	0832	0871	0910	0948	0987	1026	1064	1103	1141	4	8	12	15	19	22	27	31	Λ13
14	0.1179	1217	1255	1293	1331	1368	1406	1443	1480	1517	4	8	11	15	19	22	26	30	AI
iCP	0.1554	1591	1628	1664	1700	1736	1772	1808	1844	1879	4	7	11	14	18	22	25	29	AIG AIG
0.5	0.1915	1950	1985	2019	2054	2088	2123	2157	2190	2224	3	CPA	10	14	17	CPAR 21	24	27	AR
0.6	0.2257	2291	2324	2357	2389	2422	2454	2486	2517	2549	3	6	10	13	16	19	23	26	AIZ
).7	0.2580	2611	2642	2673	ICPAR I		PAR IUP	ARTUPAL		CPARTIC	3	6	9	12	15	19	22	25	AIÇ AIZ
HUP	AK IUPAK 1	CPARTU	PARCIUPA	I.RTCPAR	2704	2734	2764	2794	2823	2852	3	6	9	12	15	18	21	24	AIZ
8.0	0.2881	2910	2939	2967	2995	3023	27045	2/37	2023	2032	3			11/11/01			TOTAL		
,16 P	0.2001	2310	2535	2907	2993	3023	PAR iCP	RICPAI	CICPAR	iCPAR iC	LIKL	(6 A	R 8 P	1.11C	14	17 _R	20	22	AI
icp	AR iCPAR i	CPAR iCI	PAR iCPA	AR iCPAF	iCPAR i	CPAR iC	3051	3078	3106	3133	3	ic 5 ∆	R 8 P	A111C	13	16	19	22	AP
),9	0.3159	3186	3212	3238	3264	3289	PAR iCP	AR iCPAF	RICPAR	iCPAR iC	3	ic 5 A	R 8	10	13	16	18	21	AIZ
iCP					iCPAR i		3315	3340	3365	3389	2	(5 A	R 7CP	10	12	CI 15 R CPAR	17	20	AP
1.0	0.3413	3438	3461	3485	3508		PAR ICPA	AR ICPAR			2	ic5a	7	10	12	14	17	19	AK ATZ
:CD					CDAD :	3531	3554	3577	3599	3621	2	4	R 7	9	11	13	15	18	A 12
1.1	0.3643	3665	3686	3708	CDAD	CDAD :C	DAD : CD	LD : CDAI	CDAD	CDAR-IC	2	4	6	8	11	13	15	17	A P
TOP	AD COAD	CDAR	, 5000	D . CD4 I	3729	3749	3770	3790	3810	3830	2	4	6	8	10	12	14	16	AR
2	0.3849	3869	3888	3907	3925		3//0	3/30			A AAA			III GIG					
1.6	0.3043	3009	3000	3907	3923	CPAR 1C	PAR ICPA	AR ICPAI	RICPAR	iCPAR iC	2	ic 4 A	R 60P	180	P/10 i	CH 1 1R	13	R 15	AR
iCP	AR iCPAR i	CPAR iCI	PAR iCPA	AR iCPAR	iCPAR i	3944	3962	3980	3997	4015	22	ic 4 A	r 5 cp	AP7iC		CI 11 R	13		AR
1.3	0.4032	4049	4066	4082	4099	4115	4131	4147	4162	C4177	2	i(3)A	r 5cp	160	8	10R			AF1
1.4p	0.4192	4207	4222	4236	4251	. 4265	4279	4292	4306	4319	PAIR DAD	iCDA	R 4TP	16	PA 7 (i	CP8R		R 11 P. R iCP.	AF
l.5	0.4332	4345	4357	4370	4382	4394	4406	4418	4429	4441	2/ 1 R	2	R 4 P	1.F5 C	P.6	CP 7 .R	8		ar AR
1.6	0.4452	4463	4474	4484	4495	4505	4515	4525	4535	4545	P/ 1 R	(2)A	R 3TP	14 C	PA 5 t i	CP6R	iC 7 Al	8	AR
7	0.4554	4564	4573	4582	4591	4599	4608	4616	4625	4633	Þ/ 1 R	(2)A	R 37P	A1310	P/4	CP5 R	(6A)	R i 7 P	AR
1.8	0.4641	4649	4656	4664	4671	4678	4686	4693	4699	4706	₽/ 1 R	iC P A	R 2 P	13	P/4	CP4R	iC 5 A1	R 6P	AR
L.9	0.4713	4719	4726	4732	4738	4744	4750	4756	4761	4767	2/ 1 R	iC P A	R 2 P	12 C	PA 3 . i	CP4R	C4A	R i5P	
2.0	0.4772	4778	4783	4788	4793	4798	4803	4808	4812	4817	0	iCPA	R iCP	AR iC	PAR i	CPAR CP 3 R	iCPAI	R iCP. R i 4 P.	
2.1	0.4821	4826	4830	4834	4838	4842	4846	4850	4854	4957	1	iCPA	R ICP	2	2	CP2R	34		AR AR
2.2	0.4861	4864	4868	4871	4875	4878	4881	4884	4887	4890	0	iCPA	R ICP	110	DAZ I	-	-	_	
		011111									1			_	PAZ	CP2R	C2AI	R i3P	
2.3	0.4893	4896	4898	4901	4904	4906	4909	4911	4913	C4916 C	0	(0 A	R ICP	AR 1 iC	PAK 1	CP2R	iC 2 Al	R i2P	
2.4 P	0.4918	4920 CPAR 10	4922	4925	4927	C 4929 C	4931	4932	4934	4936	O.	iCOA iCPA	R 1 CP R iCP	AR 1 iC AR iC	PAR i PAR i	CP <u>1</u> .R. CPAR	iCPAI iCPAI	R i 2 P. R iCP.	
2.5	0.4938	4940	4941	4943	4945	4946	4948	4949	4951	4952	PAR			AR iC			iCPA		
2.6	0.4953	4955	4956	4957	4959	4960	4961	4962	4963	4964	PAR			AR iC			iCPAl		
2.7	0.4965	4966	4967	4968	4969	4970	4971	4972	4973	4974	PAR			AR iC			iCPAI		
2.8	0.4974	4975	4976	4977	4977	4978	4979	4979	4980	4981	PAR			AR iC			iCPAI		
2.9	0.4981	4982	4982	4983	4984	4984	4985	4985	4986	4986	PAR			AR iC			iCPAI		
10P 3.0P	0.4987	CPAR (C)		4995	4997	CPAR 10	4998	4999	4999	CPAR IC	PAR PAR			AR iC			iCPAI		

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. $P(o \le Z \le z_p) = P(Shaded Area)$
- 2. $P(Z > Z_p) = Q = \frac{1}{2} P$
- 3. $P(Z > |Z_p|) = 1 2P = 2Q$



	icpar													
AR P CPA	CIC O.25 CPA	R (0.10 CP	AR 10.05 iC	0.025	AR 0.01	0.005	O.0025	0.001	0.0005	PARQ				
AR ICPA	0.50	0.20	0.10	0.050	0.02	0.010	0.0050	0.002	0.0010	20				
IR CPA	1.000	3.078	6.314	AR 12.71	AR 31.82	63.66	AR (127.3 CPA)	318.3 AR	636.6	PAR id				
R2CPA	0.816	1.886	2.920	4.303	6.965	9.925	AR 14.09 CPA	22.33 AR	iCPA31.60 R i	PAR i				
R3CPA	0.765	1.638	AR 2.353	3.182	AR 4.541	PAR 5.841 ICE	AR 17,453 CPA	R 10.21 PAR	iCPA12.92 R iC	PAR i				
AR 4 CPA	0.741	R 1.533	AR 2.132 iC	AR 2.776	AR 3.747	AR 4.604	AR 5.598 PA	7.173 AR	8.610	PAR i				
AR ICPA AR 5 CPA	0.727	1.476	AR 2.015	2.571	AR 3.365	4.032	4.773	5.893 AR	6.869	PAR I				
AF6 CPA	0.718	1.440	AR 1.943 ICI	AR 2.447 ICI	AR 3.143	PAR 3.707 ICE	AR 4.317 CPA	5.208	5.959	PAR i				
RT CPA	0.711 ^{CPA}	1.415	AR 1.895	AR 2.365	2.998	3.499	4.029	4.785	5.408	PAR i				
AR8 CPA	0.706	1.397	1.860	2.306	2.896	3.355	3.833	4.501	5.041	PAR i				
P9 CPA	0.703	1.383	1.833	2.262	2.821	3.250	3.690	4.297	4.781	PAR i				
10	0.700	1.372	1.812	2.228	2.764	3.169	AR ICPAR ICPAI	4.144	4.587	PAR i				
11	0.697	1.363	1.796	2.201	2.718	3.106	3.497	4.025	4.437	DAD i				
12	0.695	1.356	1.782	2.179	2.681	3.055	3.428	3.930	4.318 R	PAR i				
13 PA	0.694	1.350	AR 1.771	AR 2.160	AR 2.650	PAR 3.012 ICE	AR 13.372 CPAI	R 10 3.852 AR	iCP44.221AR iC	PAR i				
14 CPA	0.692	1.345 CP	AR 1.761 ici	AR 2.145	AR 2.624 IC	PAR 2.977	AR 13.326 CPA	3.787 AR	4.140	PAR i				
150PA	0.691	1.341	AR 1.753	AR 2.131	AR 2.602	PAR 2.947	AR 3.286 PA	R 10 3.733 AR	4.073	PAR 1 PAR i				
16 PA	0.690	R 1.337 CP	AR 1.746	AR 2.120 ICI	AR 2.583	2.921	AR 13.252 CPAI	3.686	4.015	PAR i				
17CPA	0.689	1.333 CP	AR 1.740	AR 2.110	AR 2.567	2.898	AR 13.222 CPAI	3.646	3.965	PAR i				
18 PA	0.688	1.330 CP	AR 1.734	AR 2.101	2.552 ic	2.878	3.197	3.610	3.922	PAR i				
19	0.688	1.328	1.729	2.093	2.539	2.861	3.174	3.579	3.883	PAR i PAR i				
20	0.687	1.325	1.725	2.086	2.528	2.845	AR (CPAR (CPA) 3.153	3.552	3.850	PAR i				
21	0.686	1.323	1.721	2.080	2.518	2.831	3.135	3.527	3.819	DAD:				
22	0.686	1.321	1.717	2.074	2.508	2.819	3.119	3.505	3.792	DAD i				
23	0.685	1.319	1.714	2.069	2.500	2.807	3.104	3.485	3.767	DAD i				
24 PA	0.685	1.318	AR 1.711 ici	AR 2.064	AR 2.492	PAR 2.797 ICI	AR i 3.091 CPAI	3.467 AR	iCP4 3.745 AR iC	PAR i				
25°PA	0.684	1.316 CP	AR ICPAR ICE AR 1.708 ICE	AR ICPAR ICE	2.485	PAR ICPAR ICI PAR 2.787 ICI	AR ICPAR ICPAI AR I 3.078 CPAI	R ICPAR ICPAR R IC 3.450 PAR	1CPAR 1CPAR 10	PAR i PAR i				
26 PA	0.684 PA	IR i 1.315 CP	AR 1.706 iC	AR 2.056 ICI	AR 2.479	PAR 2.779 ICI	AR 13.067 CPAI	R iC 3,435 PAR	1CP 3.707 AR 10	PAR i				
27CPA	0.684	R 1.314 CP	AR 1.703 iC	AR 2.052 ICI	AR 2.473	PAR 2.771 iCI	AR 13.057 CPAI	3.421 PAR	3.690	PA 12				
28 PA	0.683	1.313	AR 1.701	2.048	2.467	2.763	3.047 CPA	3.408	3.674	PART				
29	0.683	1.311	1.699	2.045	2.462	2.756	3.038	3.396	3.659	PAR I PAR i				
30	0.683	1.310	1.697	2.042	2.457	2.750	AR ICPAR ICPAI	R ICPAR ICPAR	3.646	PAR i				
40	0.681	1.303	1.684	2.021	2.423	2.704	2.971	3.307	3.551	PAR3				
60	0.679	1.296	1.671	2.000	2.390	2.660	2.915 CPA	3.232	3.460	PART				
120	0.677	1.289	1.658	1.980	AR 2.358	PAR 2.617	AR 2.860 CPA	R 10 3.160 PAR	iCP/3.373 R i	PAR1				
COCPA	0.674	1.282	AR 1.645 IC	AR 1.960 ICI	AR 2.326	2.576	AR 2.807 CPA	3.090 AR	3.291 R	PARO				

The function tabulated is t_Q defined by

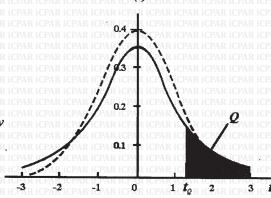
$$\int_{t_Q}^{\infty} \mathbf{f}(t)dt = Q; \quad \mathbf{f}(t) = \frac{(\frac{1}{2}v - \frac{1}{2})!}{\sqrt{(v\pi)(\frac{1}{2}v - 1)!}} \cdot \frac{1}{(1 + \frac{i^2}{2})^{(v+1)/2}}$$

where f(t) is the probability density of the t-distribution. Interpolation v-wise should be linear in 120/ v for v > 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 Q.

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.



Present value interest factor of \$1 per period at i% for n periods, PVIFA (i,n).

Period	icpar i1%	2%	3%	4%	5%	6%	AR ICPA7%	8%	9%	10%
CICPAR ICPAR	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
iCPAR i2PAR	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736
iCPAR i 3 PAF	2.941	PAR 2.884	2.829	2.775	CPAR 2.723	PAI2.673	AR (2.624)	2.577	R 2.531	2.487
icpar idpar	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170
iCPAR iSPAR	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791
iCPAR i6PAF	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355
iCPAR i 7 PAF	6.728	PAR 6.472	6.230	6.002	CPAR 5.786	PA 5.582	AR 5.389	5.206	5.033	4.868
iCPAR 8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335
iCPAR 19	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759
iCPAR10PAR	9.471	8.983	8.530	8.111	CPAR 7.722	7.360	7.024	6.710	6.418	6.145
icpar11par	10.368	PAR 9.787	9.253	8.760	PAR 8.306	7.887	7.499	7.139	6.805	6.495
iCPAR12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
iCPAR13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103
iCPAR14PAF	13.004	PA 12.106	11.296	10.563	CPAR 9.899	PA 9.295	8.745	8.244	7.786	7.367
icpar15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606
16	14.718	13.578	12.561	11.652	10.838	10.106	9.447	8.851	8.313	7.824
CPAR17PAR	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022
CEPAR18PAR	16.398	PA 14.992	13.754	12.659	CPA 11.690	10.828	AR 10.059	9.372	8.756	8.201
icpar19	17.226	15.678	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365
20	18.046	16.351	14.877	13.590	12.462	11.470	10.594	9.818	9.129	8.514

CPAR ICPAR ICPAR



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