Index No

THE INSTITUTE OF CHARTERED ACCOUNTANTS OF SRI LANKA

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SCHOOL OF ACCOUNTING AND BUSINESS
BSc. (APPLIED ACCOUNTING) GENERAL / SPECIAL DEGREE PROGRAMME

YEAR I SEMESTER II – INTAKE VII (GROUP B)
END SEMESTER EXAMINATION – OCTOBER 2017

QMT 10230 Business Statistics

Date	:	27th October 2017
Time	:	5.30 p.m. – 8.30 p.m.
Duration	:	Three (03) hours

Instructions to Candidates:

- Write the Index Number in the space provided at the top of this sheet. Do not write your name anywhere in this question paper.
- This paper consists of three parts (I, II and III).
- Part I - Answer **ALL** the Questions on the same sheet given.
  Part II – Answer any **FIVE (05)** Questions.
  Part III – Answer **ALL** Questions.
- The total marks for the paper is 100.
- The marks for each question are shown in brackets.
- Probability Sheets are included in the paper itself.
- Use of scientific calculators is allowed.
- Answers should be written neatly and legibly.

PART I

Answer **ALL** Questions

Question No. 01

Underline the correct answer.

In a survey it was necessary to collect data on the level of job satisfaction achieved by different employees. Therefore, a questionnaire was prepared and one question included in the questionnaire was

"Level of your satisfaction on the availability of promotional prospects in your current position"

Very High	☐	High	☐	Moderate	☐
Low	☐	Very Low	☐		

Answer the questions (i) and (ii) using the above information

i. Answers provided by the respondents to the above question can be considered as
   a. Qualitative discrete data
   b. Quantitative discrete data
   c. Qualitative continuous data
   d. Quantitative continuous data
   e. None of the above

ii. Answers provided by the respondents to the above question can be presented graphically by using
   a. Both Pie chart and Bar chart
   b. Both Pictogram and Histogram
   c. Both Scatter diagram and Line graph
   d. Both Scatter diagram and Bar chart
   e. Both Pie chart and Histogram

iii. *CABREW INTERNATIONAL* is a traveling agency with 152 employees. Their management assigned different activity to each employee in each month and measure their performance level based on the successful completion of such activities. To be eligible for the next increment they should maintain a mean performance level of 75 or more during the previous year. Mr. Sunil Jayaweera is one such employee who has reached a mean performance level of 72 in his first 8 assignments. What should be the minimum mean performance level, he should maintain in his last four assignments to be eligible for the increment?

a. 66
b. 73.5
c. 78
d. 81
e. 84

iv. In using mobile phones it was noted that 40% are using pre-paid services and the others use post-paid services. Having only 40% of the males using post-paid services and 35% of all the respondents are being females, find the probability that a selected respondent is using prepaid services given that he/she is a female.

a. 0.14
b. 0.21
c. 0.26
d. 0.39
e. 0.40

v. During the new-year vacation, it was noticed that 40% of the employees are going on trips and unavailable to work on weekends. However, if the management wants to request 2 employees to work on next weekend (during the new-year vacation) find the probability that they will unable to select two such employees after making requests from 10 employees.

a. 0.0017
b. 0.0123
c. 0.0463
d. 0.9532
e. 0.9983

vi. A fuel filling station has five (05) filing points of which 03 are used to fill petrol and the remaining 02 are used to fill diesel to different types of vehicles. It was noticed that on an average it will take 3 minutes to fill petrol to a vehicle while it will take 4 minutes to fill diesel to a vehicle. Number of petrol vehicles expected to enter the fuel station within an hour is estimated is 24 and the number of diesel vehicles expected to enter within an hour is 33.

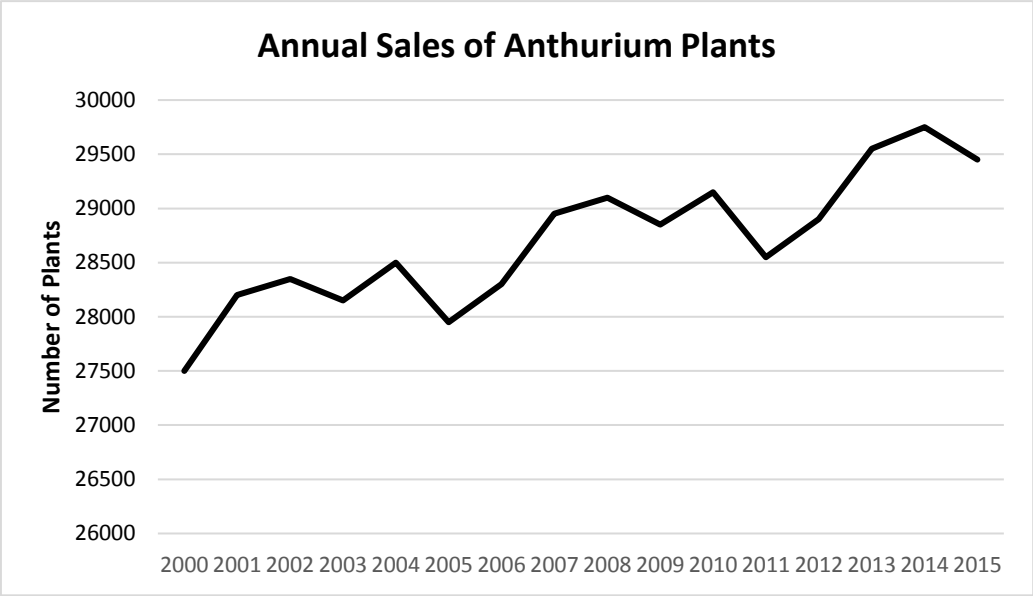
Find the probability that all petrol filling points are busy.

a. 0.1205
b. 0.3546
c. 0.6454
d. 0.7659
e. 0.8795

vii. Kandy North Bank has introduced a self-service coffee making machine to serve hot coffee to its customers. Customers can purchase a token from the counter at the cost of Rs.25/-, enter it into the coffee machine and get a 30ml cup of coffee. But customers are complained that in most of the time the cups are spilled over. Assuming that the filling per cup is normally distributed with mean 25ml and variance 16ml, how large a cup to be used in order to minimize the percentage of overfilling to just 10%.

a. 18.44 ml
b. 19.88 ml
c. 30.12 ml
d. 31.56 ml
e. 31.60 ml

viii. Given below is the line graph drawn for the annual data on sales of Anthurium plants by *ASHWEE PLANTATIONS* during 2000 - 2015.



What time series components can be identified by using the above graph?

a. Increasing trend and seasonal variation
b. Increasing trend and cyclical variation
c. Decreasing trend and seasonal variation
d. Increasing trend and cyclical variation
e. Cyclical variation and seasonal variation

ix. Data were collected from 16 different areas in Sudaroliya on the average disposable income of a household (X) and the average retail sales per month of selected consumable items (Y). The least square regression model fitted for the data is given by

$$Y = 563 + 0.3865\,X$$

What monthly disposable income would be expected to earn by a household in an area having an average retail sales of consumable items worth of Rs. 15,250 per month?

a. Rs. 37,437
b. Rs. 38,000
c. Rs. 38,894
d. Rs. 40,019
e. Rs. 40,913

x. An investment project yields different returns with different probabilities as given below.

Cash inflow (Rs. '000)	125	150	160	180
Probability	0.4	0.3	0.2	0.1

If the expected cash inflow of above investment is Rs. 145,000, find the standard deviation of cash inflows.

a. Rs. 15,000
b. Rs. 83,750
c. Rs. 190,000
d. Rs. 335,000
e. Rs. 480,000

(Total 30 Marks)

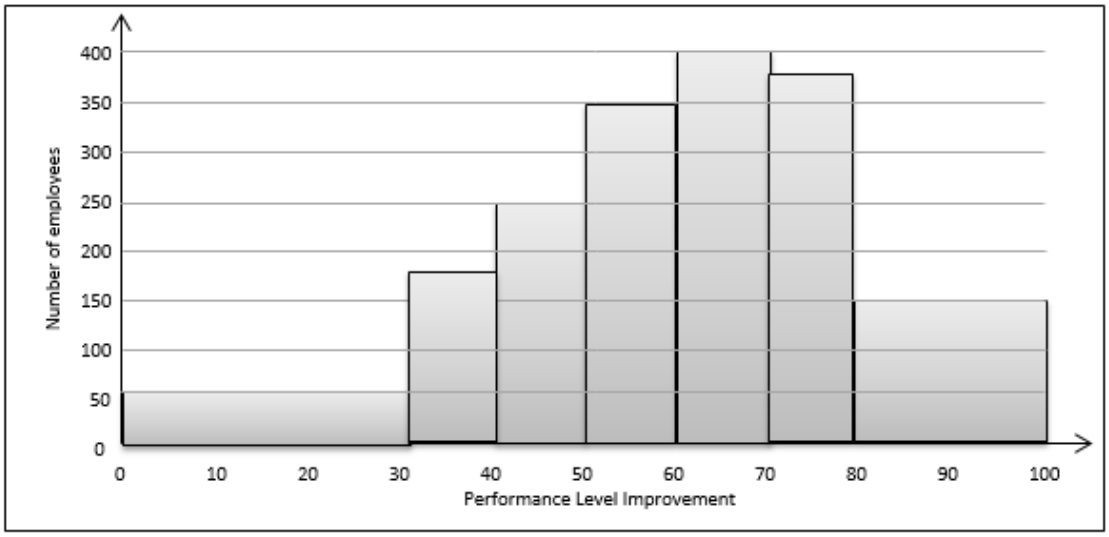
Part II

Answer **Five (05)** Questions only

Question No. 02

Introduction of free trade zones in Sudaroliya by the newly appointed government makes many female Sudarolians to select the garment industry as their final career destinations. Many skilled and unskilled labourers have joined the industry, creating a necessity to have regular workshops to improve their performance level.

Human Resource Development Institute, established in 2015 by the Sudaroliyan government to fill this performance gap, conducts regular workshops for garment sector employees. They measure the performance level of each of those employees before and after the workshops to identify the effectiveness of such workshops. Improvement in the performance level (as a percentage) of 2000 such employees is calculated and presented in the following histogram.



i. Prepare a frequency distribution table to show clearly the information presented in the above histogram.

(04 Marks)

ii. Average improvement in performance level of these employees is given as 60 percent. Calculate the standard deviation of the improvement in the performance level.

(04 Marks)

(Total 08 Marks)

Question No. 03

i. Explain why multi-stage sampling is preferred over simple random sampling when there is homogeneity between the groups as well as within groups.

(02 Marks)

ii. Telephone interviewer method and face to face interviewer method are very popular methods used in the data collection process. Mention two disadvantages in the telephone interviewer method compared to face to face interviewer method.

(02 Marks)

iii. Two questions appeared in a questionnaire are

a. Name : . . . . . .

b. Your opinion about the adequacy of using internet by the employees :

. . . . . .

Comment on the suitability of these two questions

(04 Marks)

(Total 08 Marks)

Question No. 04

MINGO ELECTRICALS is producing LED bulbs for domestic use. They sell these bulbs throughout the country using 570 sales persons and it was noticed that there is a huge variation in the number of bulbs sold by each sales personnel. Therefore, average number of bulbs sold per day by each sales personnel over the month of September,2017 is recorded and a summary table is prepared and presented for discussion at the last Management Committee meeting. The summary table presented is given below.

Average Number of Bulbs Sold per Day	**Number of Sales Personnel**
0 – 250	92
250 – 500	126
500 – 750	147
750 – 1000	135
1000 - 1250	70

Following decisions were taken in the Management Committee meeting,

- To give an appreciation award for those 10% of the sales personnel who record the highest average daily sales
- To advise strongly for those sales personnel who record an average sales of less than 150 bulbs per day

.

Accordingly

i. More than what number of bulbs per day they should sell on an average to receive the appreciation?

(04 Marks)

ii. What percentage of the sales personnel would receive the strong advise due to their poor sales performance?

(Hint : Let it be k% and equate k^{th} percentile to 150 and hence obtain the value of k)

(04 Marks)

(Total 08 Marks)

Question No. 05

Three major parties: *THE DEMOCRATIC PARTY*, *THE LIBERAL PARTY*, and *THE PEOPLES ALLIANCE* contested for the last general election in Sudaroliya. Based on the results released, 50% of the votes polled were casted by females.

DEMOCRATIC PARTY won the election securing 40% of the votes polled while *LIBERAL PARY* came second securing 35% of the votes polled.

It was also noted that 70% of the votes received by *THE DEMOCRATIC PARTY* were casted by females. On the other hand, males were more preferred towards *THE LIBERAL PARY* where 56% of the males voted for *THE LIBERAL PARTY*.

i. Present the above information in a tree diagram or a 3x2 contingency table.

(05 Marks)

ii. Using the table or the tree diagram you construct in part (i) above find out

   a. What percentage of the males voted for *THE PEOPLES* ALLIANCE?

(01½ Marks)

   b. What percentage of females voted for *THE LIBERAL PARTT?*

(01½ Marks)

(Total 08 Marks)

Question No. 06

Manufacturer of *ACQVIRA* washing machines guaranteed that 95% of the machines produced by them will last for more than 2 years without any breakdown.

i. Assuming that the life time of these washing machines is normally distributed with standard deviation 2.36, Find the mean life time of an *ACQVIRA* washing machine.

(06 Marks)

ii. Hence or otherwise determine what percentage of the *ACQVIRA* washing machines will last for more than 5 years.

(02 Marks)

(Total 08 Marks)

Question No. 07

Mr. Ramprakash is interested in entering the cut-flower industry by constructing a medium scale net house in an approximately 20 perch land either to grow Anthurium or Orchids. He estimated the income to be earned at the end of each year for the first two years (in Rs. '000,000) for each of these projects with assigned probabilities and is given in the following table.

Anthurium Project

Year I	Income to be earned	1.5	1.8	2.4
	Probability	0.5	0.3	0.2
Year II	Income to be earned	2.4	2.35	2.6
	Probability	0.4	0.4	0.2

Orchid Project

Year I	Income to be earned	1.8	2.1	2.5
	Probability	0.4	0.3	0.3
Year II	Income to be earned	1.6	2.4	2.7
	Probability	0.6	0.2	0.2

i. Calculate the expected value of the capital inflows for each year for the Anthurium project

(03 Marks)

ii. Calculate the expect value of the capital inflows for each year for the Orchid project

(03 Marks)

iii. Assuming the discount rate is 10% per annum, obtain the net present value of the capital inflows of the two projects separately (at the end of the first year) and select the most profitable investment.

(02 Marks)

(Total 08 Marks)

PART III

Answer **ALL** Questions

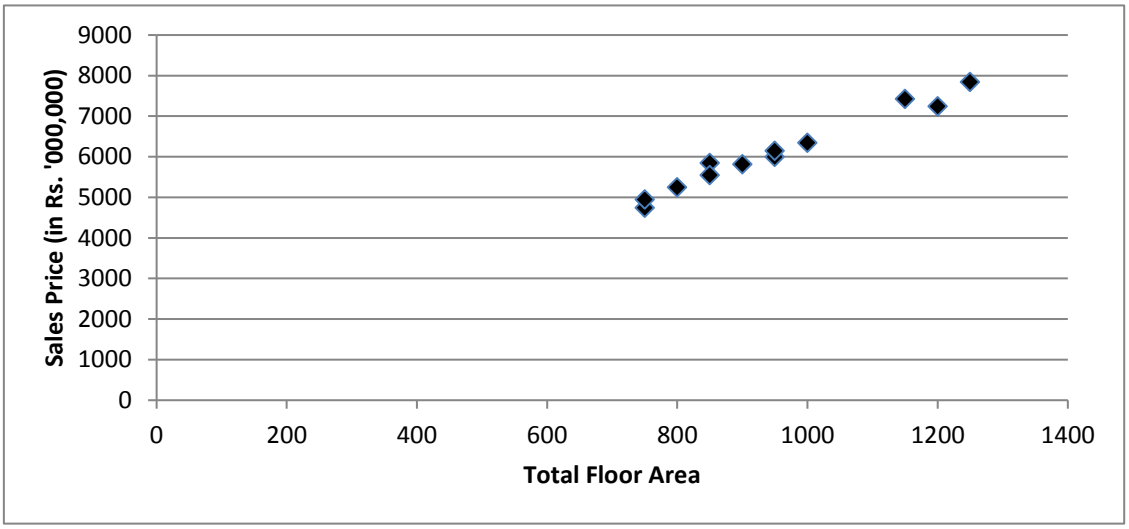
Question No 08

Due to the huge traffic congestion in Sudaroliya, most of the people living in Sub-Urban areas are moving towards its capital, Chithagon. Therefore, the construction of apartments is becoming a most profitable investment in Sudaroliya. During the last few years, many new constructions have been commenced while some other apartments are completed and ready to be sold for the general public. However, the government of Sudaroliya has noticed that the price of different apartments varies according to many factors, such as, floor at which the apartment is available, the floor area, number of bed rooms, etc.

Mr. Riswi Bernard, the Pri-minister in Sudaroliya is interested in identifying the significance of these various factors on the apartment prices, requested the Housing Development Authority to conduct a survey on these apartments. Thus, they collected the data on number of aspects and given below is the data collected on the floor area (in square meters) and the selling price (in Rs. '000,000 s) of 12 such apartments

Apartment No.	1	2	3	4	5	6	7	8	9	10	11	12
Floor Area (m^2)	750	800	850	950	1200	850	900	1000	1150	750	950	1250
Selling Price (Rs. '000)	4.75	5.25	5.85	6.00	7.25	5.55	5.82	6.35	7.43	4.95	6.15	7.85

i. The scatter diagram drawn for the above data is given below.



Using the above diagram, discuss the relationship that can exist between the two variables.

(02 Marks)

ii. Calculate the mean floor area and the mean sales price of the apartments available in Chithagon, capital of Sudaroliya.

(02 Marks)

iii. Assuming the Total Floor Area as the independent variable (X) and the Sales Price as the dependent variable (Y), the following statistics are calculated.

$$\sum (X - \bar{X})(Y - \bar{Y}) = 1{,}812{,}500$$

$$\sum (X - \bar{X})^2 = 320{,}000$$

$$\sum (Y - \bar{Y})^2 = 10{,}539{,}800$$

a. Use the above statistics to fit a simple linear regression model to explain the relationship between Total Floor Area and the Sales Price of different apartments in Chithagon.

(06 Marks)

b. Use the relationship you obtained in Part (a) above to predict the sales price of an apartment having a floor area of 1050 square meters.

(02 Marks)

c. Calculate the Pearson's correlation coefficient and comment on the result.

(03 Marks)

(Total 15 Marks)

Question No. 09

Given below are the quarterly unemployment figures (in thousands of persons) for the metropolitan area *TIRENCIA* in Sudaroliya for the period 2014 - 2016.

	Q_1	Q_2	Q_3	Q_4
2014	11.7	10.7	6.6	8.8
2015	13.3	11.5	7.4	8.4
2016	14.5	11.1	8.2	9.2

i. Use the quarterly unemployment figures in *TIRENCIA* to obtain the moving average trend values for each quarter.

(06 Marks)

ii. Using the trend values you obtained in part (i) above and assuming the additive model calculate the seasonal indices for each quarter.

(06 Marks)

iii. Using the trend values and seasonal indices you calculated in parts (i) and (ii) above, forecast the expected unemployment number for the last quarter of 2017.

(03 Marks)

(Total 15 Marks)

Binomial probabilities for $n \leq 30$ and for various vales of p

N	X \ p	0.01	0.05	0.10	0.15	0.20	0.25	0.30	⅓	0.35	0.40	0.45	0.50
2	0	.9801	.9025	.8100	.7225	.6400	.5625	.4900	.4444	.4225	.3600	.3025	.2500
	1	.0198	.0950	.1800	.2550	.3200	.3750	.4200	.4444	.4550	.4800	.4950	.5000
	2	.0001	.0025	.0100	.0225	.0400	.0625	.0900	.1111	.1225	.1600	.2025	.2500
3	0	.9703	.8574	.7290	.6141	.5120	.4219	.3420	.2963	.2746	.2160	.1664	.1250
	1	.0294	.1354	.2430	.3251	.3840	.4219	.4410	.4444	.4436	.4320	.4084	.3750
	2	.0003	.0071	.0270	.0574	.0960	.1406	.1890	.2222	.2389	.2880	.3341	.3750
	3	.0000	.0001	.0010	.0034	.0080	.0156	.0270	.0370	.0429	.0640	.0911	.1250
4	0	.9606	.8145	.6561	.5220	.4096	.3164	.2401	.1975	.1785	.1296	.0915	.0625
	1	.0338	.1715	.2916	.3685	.4096	.4219	.4116	.3951	.3845	.3456	.2995	.2500
	2	.0006	.0135	.0486	.0976	.1536	.2109	.2646	.2963	.3105	.3456	.3675	.3750
	3	.0000	.0005	.0036	.0115	.0256	.0469	.0756	.0988	.1115	.1536	.2005	.2500
	4	.0000	.0000	.0001	.0005	.0016	.0039	.0081	.0123	.0150	.0256	.0410	.0625
5	0	.9510	.7738	.5905	.4437	.3277	.2373	.1681	.1317	.1160	.0778	.0503	.0312
	1	.0480	.2036	.3280	.3915	.4096	.3955	.3602	.3292	.3124	.2592	.2059	.1562
	2	.0010	.0214	.0729	.1382	.2048	.2637	.3087	.3292	.3364	.3456	.3369	.3125
	3	.0000	.0011	.0081	.0244	.0512	.0879	.1323	.1646	.1811	.2304	.2757	.3125
	4	.0000	.0000	.0004	.0022	.0064	.0146	.0284	.0412	.0488	.0768	.1128	.1562
	5	.0000	.0000	.0000	.0001	.0003	.0010	.0024	.0041	.0053	.0102	.0185	.0312
6	0	.9415	.7351	.5314	.3771	.2621	.1780	.1176	.0878	.0754	.0467	.0277	.0156
	1	.0571	.2321	.3543	.3993	.3932	.3560	.3025	.2634	.2437	.1866	.1359	.0938
	2	.0014	.0305	.0984	.1762	.2458	.2966	.3241	.3292	.3280	.3110	.2780	.2344
	3	.0000	.0021	.0146	.0415	.0819	.1318	.1852	.2195	.2355	.2765	.3032	.3125
	4	.0000	.0001	.0012	.0055	.0154	.0330	.0595	.0823	.0951	.1382	.1861	.2344
	5	.0000	.0000	.0001	.0004	.0015	.0044	.0102	.0165	.0205	.0369	.0609	.0938
	6	.0000	.0000	.0000	.0000	.0001	.0002	.0007	.0014	.0018	.0041	.0083	0.156
7	0	.9321	.6983	.4783	.3206	.2097	.1335	.0824	.0585	.0490	.0280	.0152	.0078
	1	.0659	.2573	.3720	.3960	.3670	.3115	.2471	.2048	.1848	.1306	.0872	.0547
	2	.0020	.0406	.1240	.2097	.2753	.3115	.3177	.3073	.2985	.2613	.2140	.1641
	3	.0000	.0036	.0230	.0617	.1147	.1730	.2269	.2561	.2679	.2903	.2918	.2734
	4	.0000	.0002	.0026	.0109	.0287	.0577	.0972	.1280	.1442	.1935	.2388	.2734
	5	.0000	.0000	.0002	.0012	.0043	.0115	.0250	.0384	.0466	.0774	.1172	.1641
	6	.0000	.0000	.0000	.0001	.0004	.0013	.0036	.0064	.0084	.0172	.0320	.0547
	7	.0000	.0000	.0000	.0000	.0000	.0001	.0002	.0005	.0006	.0016	.0037	.0078
8	0	.9227	.6634	.4305	.2725	.1678	.1001	.0576	.0390	.0319	.0168	.0084	.0039
	1	.0746	.2793	.3826	.3847	.3355	.2670	.1977	.1561	.1373	.0896	.0548	.0312
	2	.0026	.0515	.1488	.2376	.2936	.3115	.2965	.2731	.2587	.2090	.1569	.1094
	3	.0001	.0054	.0331	.0839	.1468	.2076	.2541	.2731	.2786	.2787	.2568	.2188
	4	.0000	.0004	.0046	.0185	.0459	.0865	.1361	.1707	.1875	.2322	.2627	.2734
	5	.0000	.0000	.0004	.0026	.0092	.0231	.0467	.0683	.0808	.1239	.1719	.2188
	6	.0000	.0000	.0000	.0002	.0011	.0038	.0100	.0171	.0217	.0413	.0703	.1094
	7	.0000	.0000	.0000	.0000	.0001	.0004	.0012	.0024	.0033	.0079	.0164	.0312
	8	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0002	.0002	.0007	.0017	.0039
9	0	.9135	.6302	.3874	.2316	.1342	.0751	.0404	.0260	.0207	.0101	.0046	.0020
	1	.0830	.2985	.3874	.3679	.3020	.2253	.1556	.1171	.1004	.0605	.0339	.0176
	2	.0034	.0629	.1722	.2597	.3020	.3003	.2668	.2341	.2162	.1612	.1110	.0703
	3	.0001	.0077	.0446	.1069	.1762	.2336	.2668	.2731	.2716	.2508	.2119	.1641
	4	.0000	.0006	.0074	.0283	.0661	.1168	.1715	.2048	.2194	.2508	.2600	.2461
	5	.0000	.0000	.0008	.0050	.0165	.0389	.0735	.1024	.1181	.1672	.2128	.2461
	6	.0000	.0000	.0001	.0006	.0028	.0087	.0210	.0341	.0424	.0743	.1160	.1641
	7	.0000	.0000	.0000	.0000	.0003	.0012	.0039	.0073	.0098	.0212	.0407	.0703
	8	.0000	.0000	.0000	.0000	.0000	.0001	.0004	.0009	.0013	.0035	.0083	.0176
	9	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0001	.0003	.0008	.0020
10	0	.9044	.5987	.3487	.1969	.1074	.0563	.0282	.0173	.0135	.0060	.0025	.0010
	1	.0914	.3151	.3874	.3474	.2684	.1877	.1211	.0867	.0725	.0403	.0207	.0098
	2	.0042	.0746	.1937	.2759	.3020	.2816	.2335	.1951	.1757	.1209	.0763	.0439
	3	.0001	.0105	.0574	.1298	.2013	.2503	.2668	.2601	.2522	.2150	.1665	.1172
	4	.0000	.0010	.0112	.0401	.0881	.1460	.2001	.2276	.2377	.2508	.2384	.2051
	5	.0000	.0001	.0015	.0085	.0264	.0584	.1029	.1366	.1536	.2007	.2340	.2461
	6	.0000	.0000	.0001	.0012	.0055	.0162	.0368	.0569	.0689	.1115	.1596	.2051
	7	.0000	.0000	.0000	.0001	.0008	.0031	.0090	.0163	.0212	.0425	.0746	.1172
	8	.0000	.0000	.0000	.0000	.0001	.0004	.0014	.0030	.0043	.0106	.0229	.0439
	9	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0003	.0005	.0016	.0042	.0098
	10	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0003	.0010

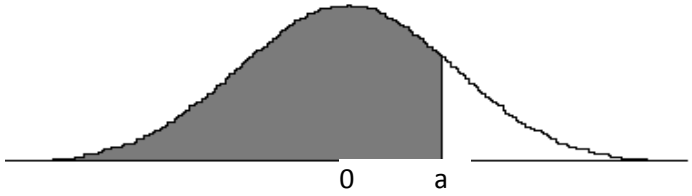
Binomial probabilities for n ≤ 30 and for various vales of p - continued

N	X \ p	0.01	0.05	0.10	0.15	0.20	0.25	0.30	⅓	0.35	0.40	0.45	0.50
12	0	.8864	.5404	.2824	.1422	.0687	.0317	.0138	.0077	.0057	.0022	.0008	.0002
	1	.1074	.3413	.3766	.3012	.2062	.1267	.0712	.0462	.0368	.0174	.0075	.0029
	2	.0060	.0988	.2301	.2924	.2835	.2323	.1678	.1272	.1088	.0639	.0339	.0161
	3	.0002	.0173	.0852	.1720	.2362	.2581	.2397	.2120	.1954	.1419	.0923	.0537
	4	.0000	.0021	.0213	.0683	.1329	.1936	.2311	.2384	.2367	.2128	.1700	.1208
	5	.0000	.0002	.0038	.0193	.0532	.1032	.1585	.1908	.2039	.2270	.2225	.1934
	6	.0000	.0000	.0005	.0040	.0155	.0401	.0792	.1113	.1281	.1766	.2124	.2256
	7	.0000	.0000	.0000	.0006	.0033	.0115	.0291	.0477	.0591	.1009	.1489	.1934
	8	.0000	.0000	.0000	.0001	.0005	.0024	.0078	.0149	.0199	.0420	.0762	.1208
	9	.0000	.0000	.0000	.0000	.0001	.0004	.0015	.0033	.0048	.0125	.0277	.0537
	10	.0000	.0000	.0000	.0000	.0000	.0000	.0002	.0005	.0008	.0025	.0068	.0161
	11	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0003	.0010	.0029
	12	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0002
15	0	.8601	.4633	.2059	.0874	.0352	.0134	.0047	.0023	.0016	.0005	.0001	.0000
	1	.1303	.3658	.3432	.2312	.1319	.0668	.0305	.0171	.0126	.0047	.0016	.0005
	2	.0092	.1348	.2669	.2856	.2309	.1559	.0916	.0599	.0476	.0219	.0090	.0032
	3	.0004	.0307	.1285	.2184	.2501	.2252	.1700	.1299	.1110	.0634	.0318	.0139
	4	.0000	.0049	.0428	.1156	.1876	.2252	.2186	.1948	.1792	.1268	.0780	.0417
	5	.0000	.0006	.0105	.0449	.1032	.1651	.2061	.2143	.2123	.1859	.1404	.0916
	6	.0000	.0000	.0019	.0132	.0430	.0917	.1472	.1786	.1906	.2066	.1914	.1527
	7	.0000	.0000	.0003	.0030	.0138	.0393	.0811	.1148	.1319	.1771	.2013	.1964
	8	.0000	.0000	.0000	.0005	.0035	.0131	.0348	.0574	.0710	.1181	.1647	.1964
	9	.0000	.0000	.0000	.0001	.0007	.0034	.0116	.0223	.0298	.0612	.1048	.1527
	10	.0000	.0000	.0000	.0000	.0001	.0007	.0030	.0067	.0096	.0245	.0515	.0916
	11	.0000	.0000	.0000	.0000	.0000	.0001	.0006	.0015	.0024	.0074	.0191	.0417
	12	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0003	.0004	.0016	.0052	.0139
	13	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0003	.0010	.0032
	14	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0005
	15	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
18	0	.8345	.3972	.1501	.0536	.0180	.0056	.0016	.0007	.0004	.0001	.0000	.0000
	1	.1517	.3763	.3002	.1704	.0811	.0338	.0126	.0061	.0042	.0012	.0003	.0001
	2	.0130	.1683	.2835	.2556	.1723	.0958	.0458	.0259	.0190	.0069	.0022	.0006
	3	0007	.0473	.1680	.2406	.2297	.1704	.1046	.0690	.0547	.0246	.0095	.0031
	4	.0000	.0093	.0700	.1592	.2153	.2130	.1681	.1294	.1104	.0614	.0291	.0117
	5	.0000	.0014	.0218	.0787	.1507	.1988	.2017	.1812	.1664	.1146	.0666	.0327
	6	.0000	.0002	.0052	.0301	.0816	.1436	.1873	.1963	.1941	.1655	.1181	.0708
	7	.0000	.0000	.0010	.0091	.0350	.0820	.1376	.1682	.1792	.1892	.1657	.1214
	8	.0000	.0000	.0002	.0022	.0120	.0376	.0811	.1157	.1327	.1734	.1864	.1669
	9	.0000	.0000	.0000	.0004	.0033	.0139	.0386	.0643	.0794	.1284	.1694	.1855
	10	.0000	.0000	.0000	.0001	.0008	.0042	.0149	.0289	.0385	.0771	.1248	.1669
	11	.0000	.0000	.0000	.0000	.0001	.0010	.0046	.0105	.0151	.0374	.0742	.1214
	12	.0000	.0000	.0000	.0000	.0000	.0002	.0012	.0031	.0047	.0145	.0354	.0708
	13	.0000	.0000	.0000	.0000	.0000	.0000	.0002	.0007	.0012	.0045	.0134	.0327
	14	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0002	.0011	.0039	.0117
	15	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0002	.0009	.0031
	16	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0006
	17	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001
	18	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
20	0	.8179	.3585	.1216	.0388	.0115	.0032	.0008	.0003	.0002	.0000	.0000	.0000
	1	.1652	.3774	.2702	.1368	.0576	.0211	.0068	.0030	.0020	.0005	.0001	.0000
	2	.0159	.1887	.2852	.2293	.1369	.0669	.0278	.0143	.0100	.0031	.0008	.0002
	3	.0010	.0596	.1901	.2428	.2054	.1339	.0716	.0429	.0323	.0123	.0040	.0011
	4	.0000	.0133	.0898	.1821	.2182	.1897	.1304	.0911	.0738	.0350	.0139	.0046
	5	.0000	.0022	.0319	.1028	.1746	.2023	.1789	.1457	.1272	.0746	.0365	.0148
	6	.0000	.0003	.0089	.0454	.1091	.1686	.1916	.1821	.1712	.1244	.0746	.0370
	7	.0000	.0000	.0020	.0160	.0545	.1124	.1643	.1821	.1844	.1659	.1221	.0739
	8	.0000	.0000	.0004	.0046	.0222	.0609	.1144	.1480	.1614	.1797	.1623	.1201
	9	.0000	.0000	.0001	.0011	.0074	.0271	.0654	.0987	.1158	.1597	.1771	.1602
	10	.0000	.0000	.0000	.0002	.0020	.0099	.0308	.0543	.0686	.1171	.1593	.1762
	11	.0000	.0000	.0000	.0000	.0005	.0030	.0120	.0247	.0336	.0710	.1185	.1602
	12	.0000	.0000	.0000	.0000	.0001	.0008	.0039	.0092	.0136	.0355	.0727	.1201
	13	.0000	.0000	.0000	.0000	.0000	.0002	.0010	.0028	.0045	.0146	.0366	.0739
	14	.0000	.0000	.0000	.0000	.0000	.0000	.0002	.0007	.0012	.0049	.0150	.0370
	15	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0003	.0013	.0049	.0148
	16	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0003	.0013	.0046

	Poisson probabilities for different values of λ										
λ \ X	0	1	2	3	4	5	6	7	8	9	10
0.01	.9900	.0099									
0.02	.9802	.0196	.0002								
0.03	.9704	.0291	.0004								
0.04	.9608	.0384	.0008								
0.05	.9512	.0476	.0012								
0.06	.9418	.0565	.0017								
0.07	.9324	.0653	.0023	.0001							
0.08	.9231	.0738	.0030	.0001							
0.09	.9139	.0823	.0037	.0001							
0.10	.9048	.0905	.0045	.0002							
0.12	.8869	.1064	.0064	.0003							
0.14	.8694	.1217	.0085	.0004							
0.16	.8521	.1363	.0109	.0006							
0.18	.8353	.1503	.0135	.0008							
0.20	.8187	.1637	.0164	.0011	.0001						
0.25	.7788	.1947	.0243	.0020	.0001						
0.30	.7408	.2222	.0333	.0033	.0003						
0.35	.7047	.2466	.0432	.0050	.0004						
0.40	.6703	.2681	.0536	.0072	.0007	.0001					
0.45	.6376	.2869	.0646	.0097	.0011	.0001					
0.50	.6065	.3033	.0758	.0126	.0016	.0002					
0.55	.5769	.3173	.0873	.0160	.0022	.0002					
0.60	.5488	.3293	.0988	.0198	.0030	.0004					
0.65	.5220	.3393	.1103	.0239	.0039	.0005	.0001				
0.70	.4966	.3476	.1217	.0284	.0050	.0007	.0001				
0.75	.4724	.3543	.1329	.0332	.0062	.0009	.0001				
0.80	.4493	.3595	.1438	.0383	.0077	.0012	.0002				
0.85	.4274	.3633	.1544	.0437	.0093	.0016	.0002				
0.90	.4066	.3659	.1647	.0494	.0111	.0020	.0003				
0.95	.3867	.3674	.1745	.0553	.0131	.0025	.0004	.0001			
1.00	.3679	.3679	.1839	.0613	.0153	.0031	.0005	.0001			
1.10	.3329	.3662	.2014	.0738	.0203	.0045	.0008	.0001			
1.20	.3012	.3614	.2169	.0867	.0260	.0062	.0012	.0002			
1.30	.2725	.3543	.2303	.0998	.0324	.0084	.0018	.0003	.0001		
1.40	.2466	.3452	.2417	.1128	.0395	.0111	.0026	.0005	.0001		
1.50	.2231	.3347	.2510	.1255	.0471	.0141	.0035	.0008	.0001		
1.60	.2019	.3230	.2584	.1378	.0551	.0176	.0047	.0011	.0002		
1.70	.1827	.3106	.2640	.1496	.0636	.0216	.0061	.0015	.0003	.0001	
1.80	.1653	.2975	.2678	.1607	.0723	.0260	.0078	.0020	.0005	.0001	
1.90	.1496	.2842	.2700	.1710	.0812	.0309	.0098	.0027	.0006	.0001	
2.00	.1353	.2707	.2707	.1804	.0902	.0361	.0120	.0034	.0009	.0002	
2.10	1225	.2572	.2700	.1890	.0992	.0417	.0146	.0044	.0011	.0003	.0001

	Poisson probabilities for different values of λ											
λ \ X	0	1	2	3	4	5	6	7	8	9	10	11
2.20	.1108	.2438	.2681	.1966	.1082	.0476	.0174	.0055	.0015	.0004	.0001	
2.30	.1003	.2306	.2652	.2033	.1169	.0538	.0206	.0068	.0019	.0005	.0001	
2.40	.0907	.2177	.2613	.2090	.1254	.0602	.0241	.0083	.0025	.0007	.0002	
2.50	.0821	.2052	.2565	.2138	.1336	.0668	.0278	.0099	.0031	.0009	.0002	
2.60	.0743	.1931	.2510	.2176	.1414	.0735	.0319	.0118	.0038	.0011	.0003	.0001
2.70	.0672	.1815	.2450	.2205	.1488	.0804	.0362	.0139	.0047	.0014	.0004	.0001
2.80	.0608	.1703	.2384	.2225	.1557	.0872	.0407	.0163	.0057	.0018	.0005	.0001
2.90	.0550	.1596	.2314	.2237	.1622	.0940	.0455	.0188	.0068	.0022	.0006	.0002
3.00	.0498	.1494	.2240	.2240	.1680	.1008	.0504	.0216	.0081	.0027	.0008	.0002
3.10	.0450	.1397	.2165	.2237	.1733	.1075	.0555	.0246	.0095	.0033	.0010	.0003
3.20	.0408	.1304	.2087	.2226	.1781	.1140	.0608	.0278	.0111	.0040	.0013	.0004
3.30	.0369	.1217	.2008	.2209	.1823	.1203	.0662	.0312	.0129	.0047	.0016	.0005
3.40	.0334	.1135	.1929	.2186	.1858	.1264	.0716	.0348	.0148	.0056	.0019	.0006
3.50	.0302	.1057	.1850	.2158	.1888	.1322	.0771	.0385	.0169	.0066	.0023	.0007
3.60	.0273	.0984	.1771	.2125	.1912	.1377	.0826	.0425	.0191	.0076	.0028	.0009
3.70	.0247	.0915	.1692	.2087	.1931	.1429	.0881	.0466	.0215	.0089	.0033	.0011
3.80	.0224	.0850	.1615	.2046	.1944	.1477	.0936	.0508	.0241	.0102	.0039	.0013
3.90	.0202	.0789	.1539	.2001	.1951	.1522	.0989	.0551	.0269	.0116	.0045	.0016
4.00	.0183	.0733	.1465	.1954	.1954	.1563	.1042	.0595	.0298	.0132	.0053	.0019
4.25	.0143	.0606	.1288	.1825	.1939	.1648	.1167	.0709	.0377	.0178	.0076	.0029
4.50	.0111	.0500	.1125	.1687	.1898	.1708	.1281	.0824	.0463	.0232	.0104	.0043
4.75	.0087	.0411	.0976	.1545	.1835	.1743	.1380	.0937	.0556	.0293	.0139	.0060
5.00	.0067	.0337	.0842	.1404	.1755	.1755	.1462	.1044	.0653	.0363	.0181	.0082
5.25	.0052	.0275	.0723	.1266	.1661	.1744	.1526	.1145	.0751	.0438	.0230	.0110
5.50	.0041	.0225	.0618	.1133	.1558	.1714	.1571	.1234	.0849	.0519	.0285	.0143
λ \ X	12	13	14	15	16	17	18	19	20	21		
3.00	.0001											
3.10	.0001											
3.20	.0001											
3.30	.0001											
3.40	.0002											
3.50	.0002	.0001										
3.60	.0003	.0001										
3.70	.0003	.0001										
3.80	.0004	.0001										
3.90	.0005	.0002										
4.00	.0006	.0002	.0001									
4.25	.0010	.0003	.0001									
4.50	.0016	.0006	.0002	.0001								
4.75	.0024	.0009	.0003	.0001								
5.00	.0034	.0013	.0005	.0002								
5.25	.0048	.0019	.0007	.0003	.0001							
5.50	.0065	.0028	.0011	.0004	.0001							

Standard Normal probabilities for $Z \leq a$



a	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	.09738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	.09793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	.09838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	.09875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	.09904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	.09927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	.09945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	.09959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	.09969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	.09977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	.09984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	.09988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998