S.Y.B.Sc. (I.T.) – Semester IV
Shashkiya Marathi II
(Time: 1 hour) **Total Marks: 30**

Instructions for the candidate:

1. Q.1 is Compulsory.
2. Attempt any 2 from Q. 2 to Q.4.
3. Answers to each new question should begin on a fresh page.
4. Figures on the right-hand side indicate full marks.

खालील प्रश्नांची उत्तरे लिहा. १० गुण

प्र-१ मराठी संकेतस्थळांचे शैक्षणिक सामाजिक आणि सांस्कृतिक योगदान स्पष्ट करा.

प्र-२ **खालील प्रश्नांची उत्तरे लिहा.**

अ ई-मेल वापरण्याचे फायदे स्पष्ट करा ५ गुण

ब संगणकिय अनुवाद साधनांविषयी माहिती लिहा. ५ गुण

प्र-३ **खालील प्रश्नांची उत्तरे लिहा.**

अ शासकीय पत्रव्यवहार करतानाचे पाळावयाचे शिष्टाचार स्पष्ट करा. ५ गुण

ब डिजिटल दस्तऐवज लेखनाचे फायदे स्पष्ट करा. ५ गुण

प्र-४ **खालील प्रश्नांची उत्तरे लिहा.**

अ बैठकीची भाषा बोलताना तुम्ही कोणती काळजी घ्याल ? ५ गुण

ब ई गव्हर्नन्स म्हणजे काय सांगून त्याचे उद्देश स्पष्ट करा. ५ गुण

12/03/2026

S.Y.B.Sc. (I.T.) – Semester IV

Embedded Systems: Principles and Practices

(Time: 1 hour) **Total Marks: 30**

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat, labeled diagrams** wherever **necessary**.

1. Attempt *any three* of the following: 15

a. What is an embedded system? Explain with a suitable example?
b. Write the difference between Embedded System & General purpose computer.
c. Explain the following generation
i) First Generation **ii)** Fourth Generation.
d. Write a short note on PLD.
e. Explain the difference between Harvard architecture and Von-Neumann architecture.
f. Write a short note on a microcontroller.

2. Attempt *any three* of the following: 15

a. Write a short note on Bluetooth technology used in an embedded system.
b. Explain the memory map with a suitable diagram.
c. Write a short note on RAM.
d. Discuss the walking 1's test used in memory testing.
e. Write a short note on GPS.
f. Explain the concept of watchdog.

S.Y.B.Sc.(I.T.) – Semester IV
SUBJECT Java Coding Development

(Time: 2 hours) Total Marks: 60

13/03/26

N. B.: (1) All questions are compulsory.
(2) Make suitable assumptions wherever necessary and state the assumptions made.
(3) Answers to the same question must be written together.
(4) Numbers to the right indicate marks.
(5) Draw neat labeled diagrams wherever necessary.
(6) Use of Non-programmable calculators is allowed.

1. **Attempt *any three* of the following:** 15
a. Explain any five features of Java.
b. Explain how multiple inheritance is achieved in Java with an example.
c. Explain the significance of this keyword in Java with an example.
d. Write a Java program to create a class Student with data members rollNo, name, and marks. Display the details using an object.
e. Write the basic structure of a Java program and explain the role of each component (class, main method, statements).
f. Explain predefined packages in Java with examples.

2. **Attempt *any three* of the following:** 15
a. Write a Java program to create your own exception for Negative Value Exception if the user enters a negative value.
b. Explain Thread class methods (any five).
c. Explain a generic class with an example.
d. Write a Java program to demonstrate ArrayList operations.
e. Explain the thread life cycle in Java with a diagram and examples for each state.
f. List and explain any five built-in exceptions in Java.

3. **Attempt *any three* of the following:** 15
a. Explain JFrame, JPanel, and JDialog.
b. Write a Java program to create a menu-driven application using JMenu.
c. Explain GridLayout with an example.
d. Differentiate between a byte stream and a character stream.
e. Explain the Delegation Event Model.
f. Create a Swing application to create a frame with a button named "cube", a label, and a TextField. Click the button, which should display the cube of that number in a label.

4. **Attempt *any three* of the following:** 15
a. Consider a table student(roll no, name, gender). Write a program to accept the values at runtime and insert them in the database using prepare statement
b. Explain JComboBox with an example.
c. Explain the JDBC architecture with a diagram.
d. Explain JTabbedPane with an example.
e. Write a Java program using the var keyword in a lambda expression.
f. List and explain any five Java 11 features.

S.Y.B.Sc.(I.T.) – Semester IV
SUBJECT CORE JAVA

(Time: 2½ hours) 13/03/26 **Total Marks: 75**

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt *any three* of the following: **15**

a. Explain Arithmetic operators with examples.
b. Explain primitive data types in Java
c. Explain different types of comments in Java.
d. Explain the meaning and use of public, static, void, String[] args.
e. Explain the lambada expression with an example.
f. Explain variables and rules for variable naming in Java

2. Attempt *any three* of the following: **15**

a. Explain the switch–case statement with a suitable example
b. Write a Java program to demonstrate the use of the super keyword.
c. Write a short note on access specifiers in Java.
d. Explain the scope rules of variables in Java.
e. Explain parameterized and default constructors.
f. Write a Java program to print the multiplication table of a number using a for loop.

3. Attempt *any three* of the following: **15**

a. Differentiate between classes and interfaces.
b. Explain how Java supports multiple inheritance using interfaces.
c. Write a Java program to find the factorial value of the given number using user defined package concept
d. How do you create your own package and import it into a Java program? Explain the procedure step-wise using a suitable example.
e. Explain the super keyword with an example.
f. Write a Java program to create your own exception for Negative Value Exception if the user enters a negative value.

4. Attempt *any three* of the following: **15**

a. Explain the states of a thread with a diagram.
b. Write a Java program to read data from the console using byte streams.
c. Explain BufferedInputStream and BufferedOutputStream.
d. What is a vector? List out any five vector methods and quote their functionality. Write one example for each.
e. Write a Java program to read and display the array elements in order.
f. Write a Java program to create a thread by extending the Thread class.

5. Attempt *any three* of the following: **15**

a. Explain inner classes used for event handling with an example.
b. Explain the Panel class with an example.
c. Write a Java program to create a CheckBox and a RadioButton using AWT.
d. Explain the TextField and TextArea components in AWT.
e. What is an Applet? Explain its life cycle in Java.
f. Write a Java program to handle keyboard events using KeyListener.

S.Y.B.Sc.(I.T.) – Semester IV (NEP)
SOFTWARE ENGINEERING

(Time: 2 hours) **Total Marks: 60**

14/03/2026

N. B.: (1) **All** questions are **compulsory**.
(2) Make**suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt *any three* of the following: 15

a. State the SDLC phases in brief.
b. Explain the layered technology of software engineering.
c. Explain the Time-boxing model in brief.
d. Write note on functional and non-functional requirements.
e. Define scrum? Explain Scrum process.
f. Define the following terms
   1. Software Process
   2. Software project

2. Attempt *any three* of the following: 15

a. What is a socio-technical system? What does it include?
b. What is data modeling and its types?
c. Explain the issues in requirement gathering.
d. What is a Critical system? State the types of critical systems.
e. What is Context Model? Explain with suitable example?
f. What are the behavioral model and its types?

3. Attempt *any three* of the following: 15

a. What is mean by process improvement? What are the different stages of process improvement?
b. Explain the user interface design process with the help of a diagram.
c. Write short note on project scheduling.
d. Brief the issues that should be considered while designing the user interface.
e. What is software quality? What are the different factors affect on software quality.
f. Explain CMMI process improvement framework.

4. Attempt *any three* of the following: 15

a. Explain goals of verification and validation.
b. Explain software inspection and roles of software inspection.
c. Explain test case design in brief.
d. Write short note on component testing.
e. What is software metrics? Explain size-oriented metrics.
f. Explain the Cost Constructive Model (COCOMO).

S.Y.B.Sc.(I.T.) – Semester IV

COMPUTER GRAPHICS

(Time: 2 hours) 16/03/2026 Total Marks: 60

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt *any three* of the following: 15

a. How is computer graphics software categorized? Explain the primary functions of each category.
b. Describe the Storage Tube Graphics Display and its working principle.
c. Explain the working of Raster Refresh (Raster-Scan) Graphics Displays.
d. Describe the Boundary Fill algorithm.
e. Generate the raster points using the DDA algorithm for the line segment joining (5, 4) and (12, 10). Show the calculations of increments and steps.
f. Explain the acceptance and rejection test using bit codes in Cohen-Sutherland line clipping algorithm.

2. Attempt *any three* of the following: 15

a. Explain the Workstation Transformation in 2D graphics.
b. What is an Affine Transformation? Explain its properties.
c. Describe 3D Scaling and explain scaling about a fixed point.
d. Using the 2D rotation transformation, rotate the polygon with vertices A(1,1),B(2,2),C(3,1) by 90 degrees counterclockwise about the origin. What are the new coordinates of the vertices?
e. Describe the CMY and CMYK color models and explain their use.
f. What is the Light Transport Equation? Explain its mathematical formulae.

3. Attempt *any three* of the following: 15

a. Differentiate between Object-space methods and Image-space methods with suitable examples.
b. Describe the Painter's algorithm (Depth sorting method) and explain its working principle.
c. Explain the concept of Visible-surface Ray Tracing. Discuss how ray tracing determines visible surfaces.
d. Derive the parametric representation of a circle.
e. Describe B-Spline curves. Explain properties of B-Spline curve.
f. Construct a third-order Bézier curve using the control polygon $P_0(2,1), P_1(3,4), P_2(6,4), P_3(7,1)$. Evaluate the coordinate of the curve for $t = 0.5$.

4. Attempt *any three* of the following: 15

a. What is Keyframing? Explain the process of keyframe animation with an example.
b. Explain animation of Groups of Objects and discuss methods used to control group behavior.
c. Describe the principle of Straight Ahead Action and Pose-to-Pose Animation.
d. What is Digital Image Processing? Explain the basic steps involved in digital image processing.
e. What is thresholding? Explain simple thresholding.
f. Given the following symbols and their corresponding frequencies, construct the Huffman coding tree and determine the binary code for each symbol.

Symbol	Frequency
P	30
Q	25
R	20
S	10
T	8
U	7

S.Y.B.Sc.(I.T.) – Semester IV

CUSTOMER RELATIONSHIP MANAGEMENT

(Time: 60 min) **Total Marks: 30**

17/03/2026

Instructions:

1. **Q.1** is Compulsory.
2. Attempt **any 2** from Q. 2 to Q.4.
3. Figures to the right indicate full marks.

1. Style Hub Retail, a growing fashion brand with multiple outlets in Mumbai, had a large customer database but struggled to convert it into repeat sales. Although many customers visited the store and website, marketing campaigns showed low response rates. Management realized that sending the same offers to all customers was ineffective and lacked proper segmentation and targeting. **10**

Style Hub treated all customers as one group, leading to:

1. Irrelevant promotions being sent to customers.
2. Low engagement with emails and messages.
3. Poor use of customer data stored in the CRM system.

As a result, customers felt disconnected, and the CRM failed to support long-term relationships.

Questions:

a) How can customer segmentation help Style Hub improve its CRM strategy?

b) How can effective customer targeting increase customer loyalty through CRM?

2. **Answer the following:**

a. Explain the challenges of data management. 5

b. What are the benefits of Digital CRM. 5

3. **Answer the following:**

a. Explain the steps in implementation of CRM. 5

b. Explain the types of loyal customers. 5

4. **Answer the following:**

a. Explain the CRM Value chain. 5

b. Explain the levels of E-CRM . 5

S. Y.B. Sc. (I.T.) – Semester IV

SUBJECT: STATISTICAL ANALYSIS

18/03/2026

(Time: 1 hour) **Total Marks: 30**

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **non-programmable** calculators is **allowed**.

1. Attempt *any three* of the following: **15**

a. Calculate arithmetic mean & mode of the distribution given below

Speed in km/hr.	40-50	50-60	60-70	70-80	80-90
Number of vehicles	34	45	56	35	20

b. Calculate quartile deviation & its coefficient

Age in years	20-24	26-30	32-36	38-42	44-48
Number of policy holders	145	165	170	155	135

c. Draw frequency polygon with the help of histogram

Weight in kg	10-20	20-30	30-40	40-50	50-60	60-70
Number of persons	10	25	15	10	30	20

d. Calculate Spearman's rank correlation coefficient between given variables

x	90	23	56	78	54	60	80	65
y	34	56	73	55	50	36	78	85

e. If $4x + 5y - 155 = 0$ & $3x + 2y - 90 = 0$ are two regression equations of lines then find
i) Mean of x & mean of y
ii) Regression coefficient of both lines.
iii) Correlation coefficient between x & y

f. Following data represents marks scored by 2 students in 7 different subjects. Calculate coefficient of range for each data & suggest performance of which student is better.

Isha	70	72	80	86	75	68	70
Riya	89	56	78	90	83	80	79

2. Attempt *any three* of the following: **15**

a. It is claimed that 3.5% population of city is unemployed. To test this claim ,450 people are selected randomly & it is observed that 50 people are unemployed. At 5% level of significance test whether claim is valid or invalid

b. A die is rolled 204 times which results the following information. At 1% level of significance, test whether die is biased or unbiased

Number appearing on upper most faces	1	2	3	4	5	6
Frequency	22	24	38	30	46	44

c. An automobile tyre manufacturer claims that average life of tyre is at least 20,000 km when used under normal circumstances. A random sample of 16 tyres were tested & it is found that mean life of tyre is 22,000 km with standard deviation 5,000 km. At 5 % level of significance test whether manufacturer's claim is valid?

d. Following data represents information about life of two brand of bulbs.

	Mean life	**Standard deviation**	**Sample size**
Brand A	2000 hrs.	250 hrs.	12
Brand B	2230 hrs.	300 hrs.	15

At 1% level of significance, determine whether there is difference in the quality of two brands of bulbs?

e. 1000 students at college level were graded according to their IQ & economic condition. Use chi-square test to find whether there is association between economic condition & IQ level. Use 5 % level of significance.

	IQ Level	
Economic condition	**High**	**Low**
Rich	460	140
Poor	240	160

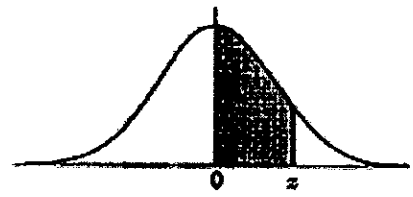
f. Intelligence test is given to 50 girls & 100 boys. Mean score of girls is 75 with standard deviation 10. Mean score of boys is 70 with standard deviation 12. Do we claim that girls are superior than boys? Use 1% level of significance.

Chi-Square (χ^2) Distribution
Area to the Right of Critical Value

Degrees of Freedom	0.995	0.99	0.975	0.95	0.90	0.10	0.05	0.025	0.01	0.005
1	—	—	0.001	0.004	0.016	2.706	3.841	5.024	6.635	7.879
2	0.010	0.020	0.051	0.103	0.211	4.605	5.991	7.378	9.210	10.597
3	0.072	0.115	0.216	0.352	0.584	6.251	7.815	9.348	11.345	12.838
4	0.207	0.297	0.484	0.711	1.064	7.779	9.488	11.143	13.277	14.860
5	0.412	0.554	0.831	1.145	1.610	9.236	11.071	12.833	15.086	16.750
6	0.676	0.872	1.237	1.635	2.204	10.645	12.592	14.449	16.812	18.548
7	0.989	1.239	1.690	2.167	2.833	12.017	14.067	16.013	18.475	20.278
8	1.344	1.646	2.180	2.733	3.490	13.362	15.507	17.535	20.090	21.955
9	1.735	2.088	2.700	3.325	4.168	14.684	16.919	19.023	21.666	23.589
10	2.156	2.558	3.247	3.940	4.865	15.987	18.307	20.483	23.209	25.188
11	2.603	3.053	3.816	4.575	5.578	17.275	19.675	21.920	24.725	26.757
12	3.074	3.571	4.404	5.226	6.304	18.549	21.026	23.337	26.217	28.299
13	3.565	4.107	5.009	5.892	7.042	19.812	22.362	24.736	27.688	29.819
14	4.075	4.660	5.629	6.571	7.790	21.064	23.685	26.119	29.141	31.319
15	4.601	5.229	6.262	7.261	8.547	22.307	24.996	27.488	30.578	32.801
16	5.142	5.812	6.908	7.962	9.312	23.542	26.296	28.845	32.000	34.267
17	5.697	6.408	7.564	8.672	10.085	24.769	27.587	30.191	33.409	35.718
18	6.265	7.015	8.231	9.390	10.865	25.989	28.869	31.526	34.805	37.156
19	6.844	7.633	8.907	10.117	11.651	27.204	30.144	32.852	36.191	38.582
20	7.434	8.260	9.591	10.851	12.443	28.412	31.410	34.170	37.566	39.997
21	8.034	8.897	10.283	11.591	13.240	29.615	32.671	35.479	38.932	41.401
22	8.643	9.542	10.982	12.338	14.042	30.813	33.924	36.781	40.289	42.796
23	9.260	10.196	11.689	13.091	14.848	32.007	35.172	38.076	41.638	44.181
24	9.886	10.856	12.401	13.848	15.659	33.196	36.415	39.364	42.980	45.559
25	10.520	11.524	13.120	14.611	16.473	34.382	37.652	40.646	44.314	46.928
26	11.160	12.198	13.844	15.379	17.292	35.563	38.885	41.923	45.642	48.290
27	11.808	12.879	14.573	16.151	18.114	36.741	40.113	43.194	46.963	49.645
28	12.461	13.565	15.308	16.928	18.939	37.916	41.337	44.461	48.278	50.993
29	13.121	14.257	16.047	17.708	19.768	39.087	42.557	45.722	49.588	52.336
30	13.787	14.954	16.791	18.493	20.599	40.256	43.773	46.979	50.892	53.672
40	20.707	22.164	24.433	26.509	29.051	51.805	55.758	59.342	63.691	66.766
50	27.991	29.707	32.357	34.764	37.689	63.167	67.505	71.420	76.154	79.490
60	35.534	37.485	40.482	43.188	46.459	74.397	79.082	83.298	88.379	91.952
70	43.275	45.442	48.758	51.739	55.329	85.527	90.531	95.023	100.425	104.215
80	51.172	53.540	57.153	60.391	64.278	96.578	101.879	106.629	112.329	116.321
90	59.196	61.754	65.647	69.126	73.291	107.565	113.145	118.136	124.116	128.299
100	67.328	70.065	74.222	77.929	82.358	118.498	124.342	129.561	135.807	140.169

S. Y.B. Sc. (I.T.) – Semester IV
SUBJECT: STATISTICAL ANALYSIS

Areas Under the Standard Normal Curve from 0 to z



z	0	1	2	3	4	5	6	7	8	9
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0754
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2258	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2518	.2549
0.7	.2580	.2612	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2996	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990
3.1	.4990	.4991	.4991	.4991	.4992	.4992	.4992	.4992	.4993	.4993
3.2	.4993	.4993	.4994	.4994	.4994	.4994	.4994	.4995	.4995	.4995
3.3	.4995	.4995	.4995	.4996	.4996	.4996	.4996	.4996	.4996	.4997
3.4	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4998
3.5	.4998	.4998	.4998	.4998	.4998	.4998	.4998	.4998	.4998	.4998
3.6	.4998	.4998	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999
3.7	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999
3.8	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999
3.9	.5000	.5000	.5000	.5000	.5000	.5000	.5000	.5000	.5000	.5000

TABLE B: t-DISTRIBUTION CRITICAL VALUES

	Tail probability p											
df	.25	.20	.15	.10	.05	.025	.02	.01	.005	.0025	.001	.0005
1	1.000	1.376	1.963	3.078	6.314	12.71	15.89	31.82	63.66	127.3	318.3	636.6
2	.816	1.061	1.386	1.886	2.920	4.303	4.849	6.965	9.925	14.09	22.33	31.60
3	.765	.978	1.250	1.638	2.353	3.182	3.482	4.541	5.841	7.453	10.21	12.92
4	.741	.941	1.190	1.533	2.132	2.776	2.999	3.747	4.604	5.598	7.173	8.610
5	.727	.920	1.156	1.476	2.015	2.571	2.757	3.365	4.032	4.773	5.893	6.869
6	.718	.906	1.134	1.440	1.943	2.447	2.612	3.143	3.707	4.317	5.208	5.959
7	.711	.896	1.119	1.415	1.895	2.365	2.517	2.998	3.499	4.029	4.785	5.408
8	.706	.889	1.108	1.397	1.860	2.306	2.449	2.896	3.355	3.833	4.501	5.041
9	.703	.883	1.100	1.383	1.833	2.262	2.398	2.821	3.250	3.690	4.297	4.781
10	.700	.879	1.093	1.372	1.812	2.228	2.359	2.764	3.169	3.581	4.144	4.587
11	.697	.876	1.088	1.363	1.796	2.201	2.328	2.718	3.106	3.497	4.025	4.437
12	.695	.873	1.083	1.356	1.782	2.179	2.303	2.681	3.055	3.428	3.930	4.318
13	.694	.870	1.079	1.350	1.771	2.160	2.282	2.650	3.012	3.372	3.852	4.221
14	.692	.868	1.076	1.345	1.761	2.145	2.264	2.624	2.977	3.326	3.787	4.140
15	.691	.866	1.074	1.341	1.753	2.131	2.249	2.602	2.947	3.286	3.733	4.073
16	.690	.865	1.071	1.337	1.746	2.120	2.235	2.583	2.921	3.252	3.686	4.015
17	.689	.863	1.069	1.333	1.740	2.110	2.224	2.567	2.898	3.222	3.646	3.965
18	.688	.862	1.067	1.330	1.734	2.101	2.214	2.552	2.878	3.197	3.611	3.922
19	.688	.861	1.066	1.328	1.729	2.093	2.205	2.539	2.861	3.174	3.579	3.883
20	.687	.860	1.064	1.325	1.725	2.086	2.197	2.528	2.845	3.153	3.552	3.850
21	.686	.859	1.063	1.323	1.721	2.080	2.189	2.518	2.831	3.135	3.527	3.819
22	.686	.858	1.061	1.321	1.717	2.074	2.183	2.508	2.819	3.119	3.505	3.792
23	.685	.858	1.060	1.319	1.714	2.069	2.177	2.500	2.807	3.104	3.485	3.768
24	.685	.857	1.059	1.318	1.711	2.064	2.172	2.492	2.797	3.091	3.467	3.745
25	.684	.856	1.058	1.316	1.708	2.060	2.167	2.485	2.787	3.078	3.450	3.725
26	.684	.856	1.058	1.315	1.706	2.056	2.162	2.479	2.779	3.067	3.435	3.707
27	.684	.855	1.057	1.314	1.703	2.052	2.158	2.473	2.771	3.057	3.421	3.690
28	.683	.855	1.056	1.313	1.701	2.048	2.154	2.467	2.763	3.047	3.408	3.674
29	.683	.854	1.055	1.311	1.699	2.045	2.150	2.462	2.756	3.038	3.396	3.659
30	.683	.854	1.055	1.310	1.697	2.042	2.147	2.457	2.750	3.030	3.385	3.646
40	.681	.851	1.050	1.303	1.684	2.021	2.123	2.423	2.704	2.971	3.307	3.551
50	.679	.849	1.047	1.299	1.676	2.009	2.109	2.403	2.678	2.937	3.261	3.496
60	.679	.848	1.045	1.296	1.671	2.000	2.099	2.390	2.660	2.915	3.232	3.460
80	.678	.846	1.043	1.292	1.664	1.990	2.088	2.374	2.639	2.887	3.195	3.416
100	.677	.845	1.042	1.290	1.660	1.984	2.081	2.364	2.626	2.871	3.174	3.390
1000	.675	.842	1.037	1.282	1.646	1.962	2.056	2.330	2.581	2.813	3.098	3.300
∞	.674	.841	1.036	1.282	1.645	1.960	2.054	2.326	2.576	2.807	3.091	3.291