

B.SC. (IT) (Sem-II) July-2023

Q.P. Code: 00000674

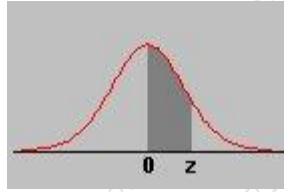
Numerical and Statistical Method

[Time:2.30 Hrs]		[ Marks:75]
Please check whether you have got the right question paper.		
N.B:	1. All question are compulsory. 2. Figures to the right indicate full marks. 3. Students answering in the regional language should refer in case of doubt to the main text of the paper in English.	

Q.1	Attempt <b><u>any three</u></b> of the following:  a) Use zero through third order taylor series expansion to predict value of $f(5)$ using base point as $x = 4$ for $f(x) = 2x^3 + 5x^2 - 7x + 97$ b) If true value of $e^{0.5} = 1.648721$ and approximate value is 1.5. Find the true error and relative error. c) A motorboat goes upstream on a river and covers the distance between two towns on the riverbank in 12 hours. It covers this distance downstream in 10 hours. If the speed of the stream is 3 km/hr, find the speed of the boat in still water. d) Derive the Maclaurin series for $f(x) = \cos x$ e) Round off the number 76.4350 to four significant figures and compute the percentage error. f) Given a value of $\bar{x} = 1.5$ with an error of $\Delta\bar{x} = 0.01$ , estimate the resulting error in the function, $f(x) = x^3$	15
Q.2	Attempt <b><u>any three</u></b> of the following:  a) Perform 4 iterations of bisection method to find root of $f(x) = x^3 - 4x + 1$ . b) Perform 3 iterations of Newton Raphson method.to find root of $f(x) = 2x^3 - 3x - 6$ . c) Find the curve passing through the points (1, 4), (2, 7), (3, 12), (4, 15) using Newton's forward difference formula. d) Construct the forward difference table for $f(x) = x^4 + 3x^3 + 1, x: 1(1)5$ . e) Find the root of $x^3 - 5x + 1$ perform 4 iterations of secant method. f) Find the polynomial $f(x)$ such that $f(3) = 1, f(4) = 2$ and $f(5) = 4$ using Lagrange interpolation.	15

Q.3	<p>Attempt <b>any three</b> of the following:</p> <p>a) Perform 3 iterations of Gauss Siedel method <math>7x + y + 3z = 10, 2x - 9y + z = 11, x + y - 12z = 20</math></p> <p>b) Evaluate <math>\int_0^6 \frac{1}{1+x^2} dx</math> by taking <math>n=6</math> by all simpson's 1/3 rd rule. Also find value of <math>\pi</math>.</p> <p>c) For the following table obtain <math>\frac{dy}{dx}</math> &amp; <math>\frac{d^2y}{dx^2}</math> at <math>x = 3.8</math></p> <table><tr><td>X</td><td>3</td><td>3.2</td><td>3.4</td><td>3.6</td><td>3.8</td></tr><tr><td>Y</td><td>1.7183</td><td>2.3201</td><td>3.0552</td><td>4.9530</td><td>5.0496</td></tr></table> <p>d) Find <math>y(1.2)</math>, for <math>\frac{dy}{dx} = y + x, y(1) = 2, h = 0.1</math> using R-K method of 4<sup>th</sup> order.</p> <p>e) Solve using Gauss Jordan Method <math>x + 2y + z = 3, 2x + 3y + 3z = 10, 3x - y + 2z = 13</math></p> <p>f) <math>y' = 2xy, y(2) = 1</math>. Find <math>y(2.25)</math> using Modified Euler's Method.</p>	X	3	3.2	3.4	3.6	3.8	Y	1.7183	2.3201	3.0552	4.9530	5.0496	15																						
X	3	3.2	3.4	3.6	3.8																															
Y	1.7183	2.3201	3.0552	4.9530	5.0496																															
Q.4	<p>Attempt <b>any three</b> of the following:</p> <p>a) Calculate the coefficient of correlation for the following:</p> <table><tr><td>x</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>y</td><td>2</td><td>4</td><td>9</td><td>7</td><td>10</td><td>5</td><td>14</td><td>16</td><td>2</td><td>20</td></tr></table> <p>b) From the data given below find the number of items <math>n</math>, <math>r = 0.5</math>, <math>\sum(x - \bar{x})(y - \bar{y}) = 120, \sigma_y = 8, \sum(x - \bar{x})^2 = 90</math></p> <p>c) The following data are given about the expenditure on clothes and expenditure on entertainment. Average expenditure on clothes Rs.300, average expenditure on entertainment Rs. 100, S.D of expenditure on clothes Rs. 20, S.D of expenditure on entertainment Rs 15, coefficient of correlation 0.78. Find the two regression equations.</p> <p>d) Fit a straight line of the form <math>y = ax+ b</math> using least square method</p> <table><tr><td>x</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>y</td><td>1</td><td>2.9</td><td>4.8</td><td>6.7</td><td>8.6</td></tr></table>	x	1	2	3	4	5	6	7	8	9	10	y	2	4	9	7	10	5	14	16	2	20	x	0	1	2	3	4	y	1	2.9	4.8	6.7	8.6	15
x	1	2	3	4	5	6	7	8	9	10																										
y	2	4	9	7	10	5	14	16	2	20																										
x	0	1	2	3	4																															
y	1	2.9	4.8	6.7	8.6																															

		<p>e) A cooperative society of farmers has 50 hectare of land to grow two crops X and Y. The profit from crops X and Y per hectare are estimated as Rs 10,500 and Rs 9,000 respectively. To control weeds, a liquid herbicide has to be used for crops X and Y at rates of 20 litres and 10 litres per hectare. Further, no more than 800 litres of herbicide should be used in order to protect fish and wild life using a pond which collects drainage from this land. Formulate the problem as a linear programming problem.</p> <p>f) Solve the following linear programming by graphical method.  Maximize <math>Z = 3x + 9y</math>  subject to <math>x + 3y \leq 60</math>, <math>x + y \geq 10</math>, <math>x \leq y</math>, <math>x \geq 0</math>, <math>y \geq 0</math></p>	
Q.5		<p>Attempt <b><u>any three</u></b> of the following:</p> <p>a) Let X : no. of heads in three tosses of an unbiased coin. Find its probability mass function <math>p(x)</math> and find expectation of random variable X.</p> <p>b) X and Y are two independent random variables with <math>E(X) = 5</math>, <math>V(X) = 2</math>, <math>E(Y) = 12</math> and <math>V(Y) = 3</math>. Find <math>E(X + Y)</math>, <math>E(2X + 3Y)</math>, <math>V(X + Y)</math>, <math>V(2X - 5Y)</math>.</p> <p>c) For a binomial variate if mean = 3, <math>15P(X=0) = 2P(X=1)</math>. Find <math>P(X=5)</math>.</p> <p>d) X is a normal variate with mean 30 and S.D 5. Find the probabilities that  i) <math>26 \leq X \leq 40</math> ii) <math>X \geq 45</math> iii) <math>X \geq 15</math></p> <p>e) X follows Uniform continuous distribution with p.d.f given as  <math display="block">f(x) = \frac{1}{8}, \quad 0 \leq x \leq 8</math> <math display="block">= 0, \text{ otherwise}</math> Find <math>P(2 \leq X \leq 5)</math>, <math>P(X &lt; 7)</math>, <math>P(4 \leq X \leq 12)</math>.</p> <p>f) X is normally distributed with mean 12 and S.D 4. Find <math>x_2, x_3</math> when  <math>P(x_2 &lt; X &lt; x_3) = 0.5</math> and <math>P(X &gt; x_3) = 0.25</math>.</p>	15



Standard Normal Variate

	0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0	0	0.004	0.008	0.012	0.016	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.091	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.148	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.17	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.195	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.219	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.258	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.291	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.334	0.3365	0.3389
1	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.377	0.379	0.381	0.383
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.398	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.437	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.475	0.4756	0.4761	0.4767
2	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.483	0.4834	0.4838	0.4842	0.4846	0.485	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.489
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.492	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.494	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.496	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.497	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.498	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.499	0.499

[Time:2.30 Hrs]		[ Marks:75 ]
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Q.1	Attempt <b><u>any three</u></b> of the following:  a. List and explain important applications of internet in brief b. Write a short note on search engine. c. List and explain different types of cascading style sheets d. Write a short note on internet address e. Write a program for different font formatting tags. f. Explain the structure of HTML5 file.	15
Q.2	Attempt <b><u>any three</u></b> of the following:  a. Explain semantic tags of HTML 5. b. Explain <DIV> tag with the help of an example. c. Explain any five attributes of <TABLE> tag. d. What is image map? Explain with example server side image map e. Write a HTML5 program to display registration form with all controls. f. Explain with example how text based navigation bar is created	15
Q.3	Attempt <b><u>any three</u></b> of the following:  a. What are operators in JavaScript? Explain any five of them. b. What is the difference between break and continue? Explain with an example. c. Explain following event attributes: i. onblur ii. onchange iii. ondblclick iv. onkeydown v. onmousedown d. Explain difference between client side javascript and server side javascript. e. Write a code for well-designed and validated form. f. What are event handlers? List various types of keyboard event.	15
Q.4	Attempt <b><u>any three</u></b> of the following:  a. What are different types of array available in PHP? b. Explain program structure in PHP with simple example. c. Explain error handling in PHP. d. Explain any five string methods with example. e. What is the difference between Get and Post method?	15



	f. Explain ternary operator with example.	
Q.5	<p>Attempt <b><u>any three</u></b> of the following:</p> <p>a. Explain any five PHP/MySQL functions with example.</p> <p>b. Write short note on Cookies.</p> <p>c. Explain syntax of creating table in MySQL with example.</p> <p>d. How an email is sent in PHP? Explain with an example.</p> <p>e. Write a PHP code to find the greater of 2 numbers. Accept the no. from the user.</p> <p>f. Design a PHP page for authenticating a user.</p>	15

**B.Sci.(IT) (Sem-II) July-2023****Q.P. Code: 00000665****Object Oriented Programming****[Time:2.30 Hrs]****[ Marks:75 ]**

Please check whether you have got the right question paper.

- N.B:
1. All question are compulsory.
  2. Figures to the right indicate full marks.
  3. Students answering in the regional language should refer in case of doubt to the main text of the paper in English.

Q.1	Attempt <b><u>any three</u></b> of the following:  a. What is object oriented programming? State its applications b. Explain the concept of abstraction with suitable example c. What is inheritance? State its types? d. Write a note on dynamic binding. e. Distinguish between Procedure Oriented Programming and Object Oriented Programming f. What is the relation between Object and Class.	15
Q.2	Attempt <b><u>any three</u></b> of the following:  a. Explain the structure of C++ class b. What do you mean by global variable and local variable in C++? c. Write a C++ program to implement the concept of constructor and destructor. d. Explain the concept of pointer to object with suitable example. e. What is friend class? Write a program to illustrate the concept of friend class. f. What is constructor? State its characteristics.	15
Q.3	Attempt <b><u>any three</u></b> of the following:  a. What is overloading? Write a program to demonstrate the concept of function overloading. b. What is abstract class? State the properties of abstract class c. What is method overriding? Explain the use of virtual function d. What is static function? Explain how it is implemented. e. List the operators that cannot be overloaded. Explain the rules for overloading the operators. f. What is Virtual Destructor ? Explain with example.	15

Q.4	<p>Attempt <b><u>any three</u></b> of the following:</p> <ol style="list-style-type: none"> <li>Explain the concept of multilevel inheritance with suitable examples.</li> <li>Explain the mechanism of handling the exception with suitable example.</li> <li>Write a program to implement the concept of single level inheritance.</li> <li>Explain in brief about hybrid inheritance with suitable example.</li> <li>Explain the use of throw and catch keywords with proper syntax.</li> <li>Explain the difference between deriving a class with public mode and private mode.</li> </ol>	15
Q.5	<p>Attempt <b><u>any three</u></b> of the following:</p> <ol style="list-style-type: none"> <li>Explain with example the use of class templates.</li> <li>What are file operations? Explain different modes of file.</li> <li>Write a program to copy the content from file1 to file2.</li> <li>What is Function Templates and explain with an example</li> <li>What is the difference between a text file and a binary file?</li> <li>Write a C++ program to implement the concept of class template.</li> </ol>	15



[Time:2.30 Hrs]		[ Marks:75 ]
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Q.1	Attempt <b><u>any three</u></b> of the following: a. What initiatives we need to take care against Green computing. b. How Hardware Deployments can affect the environment?  c. Explain how Green Computing effect on Cost Saving. d. Mention the steps taken by various countries in managing their own e-waste problem? e. Describe the functions of Basel Action Network. f. What are the steps involved for measuring of Carbon Footprint?	15
Q.2	Attempt <b><u>any three</u></b> of the following: a. How you utilize Power at the time of computer use? Give details. b. Give advantages of custom centralized Air-Handling System. c. How to prevent Recirculation of Equipment Exhaust? d. How to achieve proper Humidity Levels & reduce cooling cost? e. Explain importance of Wireless device. f. How computer monitor settings save energy?	15
Q.3	Attempt <b><u>any three</u></b> of the following: a. Analyze Global impact on local actions? b. What are the ways to control the use of water in organization?  c. Write note on EDF? d. Which things are needed to go paperless in organization? e. What is Telecommuting? Explain in brief. f. Describe intranet? How to build it?	15
Q.4	Attempt <b><u>any three</u></b> of the following: a. what do you mean by Recycling & Refurbishing b. List various ways to clean a Hard Drive. Explain any two. c. Give advantages of buying various equipment. d. Explain how Remote Desktop Server is configured. e. Explain Restriction of Hazardous Substances certification program.	15

		f. Define and explain the terms packaging and Toxins with respect to hardware considerations.	
Q.5		<p>Attempt <b><u>any three</u></b> of the following:</p> <p>a. List key strategies to review action plan to stay green. .</p> <p>b. Write note on Green supply chain?</p> <p>c. List and explain tools used for tracking our data</p> <p>d. Describe the work of Chief Green Officer that helps to greening our information system.</p> <p>e. Explain characteristics of Software as a Service.</p> <p>f. Which area needs to be updated in organization to reduce the amount of waste paper?</p>	15

<b>[Time:2.30 Hrs]</b>		<b>[ Marks:75 ]</b>
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<b>Q.1)</b>	<b>Attempt any 3 of the following:</b> <ol style="list-style-type: none"><li>a. What is a microprocessor? And why the microprocessor is viewed as a programmable device?</li><li>b. Explain the types of computer languages. What are the advantages of an assembly language over the high-level language?</li><li>c. Explain the role of 8085 system bus is communication of MPU with peripherals</li><li>d. Explain the following interfacing devices: (A) Tristate device (B) Buffer (C) D-Flip flop</li><li>e. Explain 8085 microprocessor architecture in detail with block diagram.</li><li>f. How to interface the EPROM. What is the address decoding technique &amp; state the memory address range?</li></ol>	<b>(15)</b>
<b>Q.2)</b>	<b>Attempt any 3 of the following:</b> <ol style="list-style-type: none"><li>a. If an output and input port can have the same 8-bit address, how does the 8085 differentiate between the ports?</li><li>b. Differentiate between Memory Mapped I/O and Peripheral I/O.</li><li>c. Explain in detail with diagram 8085 programming model and flag register.</li><li>d. Write instructions to load the two hexadecimal numbers 32H and 48H in registers A and B respectively. Add the numbers, and display the sum at the LED output port PORT1.</li><li>e. Explain Arithmetic operations with example.</li><li>f. Explain branch operations with example.</li></ol>	<b>(15)</b>

<b>Q.3)</b>	<b>Attempt any 3 of the following:</b> a. Write Logical instructions with program. b. Describe the concept about dynamic debugging. c. Write in short about Counter & Time Delays in 8085. d. How to write a program for generating pulse wave form. e. Explain the concept of Stack, subroutines, Return, Restart and conditional Call. f. Explain about nesting of subroutines.	<b>(15)</b>
<b>Q.4)</b>	<b>Attempt any 3 of the following:</b> a. Explain BCD –to –binary conversion with examples. b. Write a program for BCD to common cathode LED code conversion. c. Write a program to subtract a 2-digit BCD number from another 2-digit BCD number. d. Explain Multiplication with examples. e. Describe about software development of microprocessor f. Describe about Cross Assembler	<b>(15)</b>
<b>Q.5)</b>	<b>Attempt any 3 of the following:</b> a. Explain the working of an interrupt in 8085 Microprocessor. b. Write a short note on Direct Memory Access (DMA). c. Explain the architecture of Pentium Processor. d. Explain the page tables and memory management concept in processor. e. Enlist various microprocessor names and its core types. f. What do you mean by Hyper-Threading in microprocessors?	<b>(15)</b>