Question Bank
MCST201: Python Programming

2 marks questions

1. What is CSV and TSV file?
2. What is TSV file?
3. What are CSV files?
4. What is the default mode of opening a file?
5. What are file opening modes?
6. Which method can be used to open a file in file handling?
7. What is the mode in which you will open a file for reading?
8. What is the mode in which you will open a file for Writing?
9. What is the mode in which you will open a file for appending?
10. What is negative index in Python?
11. What is negative indexing explain with an example in Python?
12. What does it mean when an index is negative?
13. What is negative indexing in NumPy arrays?
14. How do you describe a dictionary?
15. What are the uses of dictionary in python?
16. What is dictionary and its uses?
17. What are the functions of dictionary?
18. Describe Dictionary.
19. State use of namespace in Python.
20. How are namespaces used?
21. What is namespace and types in Python?
22. Why do we use namespace in Python on SQL?
23. What is the use of import and namespace in Python?
24. Describe Python Interpreter.
25. What are Python interpreters examples?
26. What are the three file modes in Python?
27. What are different modes to open a file in Python?
28. Name the three modes in which file can be opened in python.
29. List different data types in Python
30. What are different data types in Python?
31. What are the 5 Python data types?
32. How many different data types are there in Python?
33. Can you have different data types in a list Python?
34. How do you comment in Python?
35. How do you write a comment in Python example?
36. What is comment in Python and state its types?
37. How do you comment out a class in Python?
38. State how to perform comments in Python
39. Explain why tuples are called as immutable

40. Why tuple is immutable with example?
41. Is tuple always immutable?
42. Why are strings and tuples immutable?
43. Explain variable in Python with its rules and conventions for declaration?
44. What are the rules for declaration of variable?
45. What are variable in Python?
46. How can we declare variable in Python?
47. What is used for variable declaration in Python?
48. List features of Python.
49. What is Python list its features?
50. Why ** is used in Python?
51. What are the 4 operators in Python?
52. What is the use of operator in Python with examples?
53. Mention the use of **, % operator in Python.
54. Why % is used in Python?
55. Define function in Python
56. What is define function in Python?
57. What is DEF ()?
58. Where is function defined?
59. What is function in Python and its types?
60. Write the syntax of fopen?
61. What is the syntax of open function?
62. Which is the correct syntax for opening a file in Python?
63. How do you write to a file in Python?
64. Define any four methods in math module.
65. What is the use of math module, write any 4 functions?
66. What are the methods in math objects?
67. What is module math in Python?
68. What do you understand by math module name any two math functions?
69. List built in class attributes.
70. What are attributes of class?
71. What are built-in class attributes and explain in Python?
72. What are the built-in classes in Python?
73. What is the use of pandas library?
74. Explain Pandas library in detail.
75. Why we are used pandas library?

4 marks questions

1. List the salient features of python programming language.
2. What are the key features of Python?
3. Write a program to input any two tuples and interchange the tuple variable.

4. How do you swap the values of two variables using tuples?
5. How do you input a tuple in Python?
6. How do you change items in a tuple in Python?
7. Can you add 2 tuples in Python?
8. Describe various modes of file object? Explain any two in detail.
9. What are various modes of file object explain any five?
10. What are the various file modes in Python?
11. What mode is the file object in?
12. What are the two types of files in Python?
13. Explain the parameter of pyplot's plot() method with an example.
14. Which are the parameters of Pyplot's plot method?
15. What are the parameters of the plot function in Matplotlib?
16. Which of the following is not the parameter of Pyplot's plot () method?
17. What does plot () do in Python?
18. List the standard data types in python.
19. What are the standard data types of Python?
20. What is exceptions handling with example?
21. What is exception handling in Python with examples?
22. What are the different ways to handle exceptions explain?
23. What are examples of exceptions?
24. Describe about Handling Exceptions in detail with examples.
25. Explain the three types of import statement in Python.
26. What are import statements in Python?
27. How many import are there in Python?
28. What are import statements?
29. What is the use of write () and WriteLine () methods?
30. What is difference between WriteLine () and write () method?
31. What is the difference between write () and WriteLine () in Python?
32. What does write () do in Python?
33. Describe how the Write() and WriteLine() method works on a file.
34. What are modules in Python? Explain.
35. What is module in Python and types?
36. What are modules?
37. What are Python modules name?
38. Write the steps to install Python and to run Python code.
39. How do I install and run Python?
40. What are the steps to install Python?
41. How do I install a Python .PY file?
42. What are the steps in downloading and installing Python page?
43. What is list describe any four methods of lists in Python?
44. What are the methods of list in Python?
45. How many types of lists are there in Python?
46. How many ways are there to create a list in Python?

47. Describe any four methods of lists in Python.
48. Explain the concept of function with an example.
49. What is a function in Python explain with an example?
50. What is function concept in Python?
51. What are packages? Give an example of package creation in Python.
52. What are packages in Python with examples?
53. What are packages in Python give an example of package creation in Python?
54. What is package and create package in Python?
55. What is package definition in Python?
56. Explain about the different types of Exceptions in Python.
57. What are the different types of exceptions in Python?
58. What are exceptions explain the different types of exceptions?
59. What is exception in Python explain its types with example?
60. What are the 3 major exception types in Python?
61. What is list? Explain the concept of slicing and indexing with proper examples.
62. What is a list explain the concept of slicing and indexing with proper examples?
63. What is slicing in list explain with example?
64. What is slicing a list in Python?
65. What is a slicing index?
66. What is the difference between read () and readline () function?
67. How does readline () work in Python?
68. What is the difference between file read () and file readline ()?
69. What does file readline () do?
70. Describe how the read() and readline() method works on a file.
71. Explain about the types of databases used in python.
72. What are the types of database in Python?
73. What are databases Python?
74. What are different types of database?
75. Does Python have its own database?
76. Which database is used for Python?Explain in brief.
77. Can Python work with databases?Explain.
78. Where is the data stored in Python?
79. Write the output for the following if the variable fruit='banana':

```
>>>fruit[:3]
>>>fruit[3:]
>>>fruit[3:3]
>>>fruit[:]
```

80. Explain about string slicing with examples.
81. What is string slicing with example?
82. What is a string slicing?

83. What is string slice with example in python?
84. What are the type of chart is supported by pyplot? Explain any one with example.
85. Which are the types of chart is not supported by Pyplot?
86. How many types of graphs are plotted using Pyplot?
87. What are the different types of plots in Matplotlib?
88. What is Matplotlib in Python explain with example?
89. What is set in Python with example?
90. What is the set in Python?
91. What is set and explain the methods of set in Python?
92. What is set and list in Python?
93. What is set in Python with example?
94. What is set in Python definition?
95. What is set and explain the methods of set in Python?
96. What is set and list in Python?
97. Describe Set in python with suitable examples.
98. Describe module in Python with its advantages?
99. What is module in Python and its advantages?
100. What describes a module in Python?
101. What is module in Python and types?
102. What is user defined module?
103. What is chained conditional statement?
104. What is chained conditional and nested conditional?
105. What is the difference between a chained conditional and a nested conditional in Python?
106. What is nested conditionals in Python?
107. What is chained conditional statement?
108. Design a python program which will throw exception if the value entered by user is less than zero.
109. How do you throw an exception in Python?
110. How do you create a user defined exception in Python explain with example?
111. What is an exception explain with few examples in Python?
112. How do you handle exceptions in Python example?
113. What are the benefits of Python over others?
114. Mention four benefits of using Python.
115. What is len function and explain how it is used on strings with an example.
116. What is Len function and explain how it is used on strings with an example?
117. What is the use of LEN function explain?
118. How do you use LEN in string?
119. Is Len () in python a string?
120. Show the output for the following:

1. >>> a=[1,2,3]
   >>>b=[4,5,6]
   >>> print('c=',a+b)
2. >>>print([1,2,3]*3)
3. >>>t=[‘a’,’b’,’c’,’d’,’e’,’f’]
   >>>t[1:3]=[‘x’,’y’]
   >>>print t
4. >>> print(t[0:5])

6 marks questions

1. What is list? Explain the concept of slicing and indexing with proper examples.
2. What is slicing and indexing in list explain with example?
3. Differentiate string indexing and slicing with example?
4. What is indexing in Python with example?
5. What is a Indexing in Python?
6. What is indexing and slicing with example?
7. What is the local variable and global variable explain with an example Python?
8. What is local scope and global scope in Python?
9. What is the local variable and global variable explain with an example?
10. What is scope of variable explain global and local variable?
11. What is local and global scope of variable in python .Explain the different scenarios with an example snippet.
12. What are the different flow control statements supports in python. Explain any two with a suitable example program and flow chart.
13. What are the different flow control statements available in Python explain with suitable examples?
14. What are the different flow control statements supports in Python?
15. What are the different types of control flow statements explain with suitable example?
16. What is flow control statements in Python?
17. How do you create a database in Python?
18. Can we use SQL database in Python?
19. Write the steps of how do we create a MySQL database in Python?
20. How do I create a SQL query in Python?Explain in detail.
21. How to Create and Manipulate SQL Databases with Python?
22. Explain any six built in methods of string.
23. What are the inbuilt methods available in string?
24. What are the string 5 methods?
25. What is string explain any 5 inbuilt functions of string?
26. How many string methods are there in python?
27. What are the 2 membership operators in Python?

28. What are membership operators in Python?
29. What are membership operators in a string explain with an example?
30. What are the logical operators in Python explain with example?
31. Explain two Membership and two logical operators in python with appropriate examples.
32. Explain any 4 built-in numeric data types in Python?
33. What are the 4 built-in numeric data types of Python?
34. What are the built-in numeric data types in Python explain?
35. How many built-in numeric data types are in Python?
36. What are the built-in types in Python?
37. Design a class Employee with data members: name, department and salary. Create suitable methods for reading and printing employee information.
38. How do you display employee details in Python?
39. Use of any four methods of tuple in python?
40. What are the methods used in Python tuple?
41. Which three methods would be used with tuple objects in Python?
42. Which are the methods will work with tuples?Explain.
43. What describes a module in Python?
44. What is module in Python and types?
45. What are the 3 modules in Python?
46. Describe module in Python with its advantages?
47. Explain different loops available in python with suitable examples.
48. What are the different loops available in Python?
49. What is for loop in Python explain with example?
50. What are the loops explain with example?
51. What are the arithmetic operators in Python?
52. What are the 2 arithmetic operators?
53. What are the two types of arithmetic operators in Python?
54. What is arithmetic operator and relational operator?
55. Describe any two arithmetic operators and two relational operators in Python.
56. Explain briefly constant, variables, expression, keywords and statements available in python.
57. What are variables and expression in Python?
58. What is a variable and a constant in Python?
59. What are the types of statements available in Python?
60. What are the 4 variables in Python?
61. List some few common Exception types and explain when they occur.
62. What is an exception explain types of exceptions and give an example?
63. What are the 3 major exception types in Python?
64. What are the three types of exceptions?
65. What are the types of exceptions explain them?

66. What are the file operations in Python with example?
67. What are the types of files in Python?
68. What is a file and file operations in Python?
69. What are file functions in Python?
70. Explain in detail about Python Files, its types, functions and operations that can be performed on files with examples.
71. Explain the types of operators in python with appropriate example.
72. What are the types of operators in Python?
73. What are operators in Python give example?
74. What are the different types of operators explain with examples?
75. How to Create and Manipulate SQL Databases with Python?
76. What is a function? How to define a function in python? Write a program using function to find out the given string is palindrome or not.
77. How do you check a given string is palindrome or not in Python?
78. How do you check whether a number is palindrome or not in Python using function?
79. What is a palindrome in Python?
80. How do you check if a given string is palindrome or not?

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Question Bank

MCST 202: Cloud Computing

M.Sc.I (Sem II)

❖ **Answer in one sentence**

1. What is Cloud Computing?
2. What is Microsoft Azure?
3. Define Broadband Networks.
4. What is Client?
5. Define Multitenant Technology.
6. Write short note on Virtualization.
7. What is Cloud?
8. What is Web Browser?
9. Write a short note on advantages of Cloud Computing.
10. Write a Short note on IAAS.
11. Write a Short note on PAAS.
12. Write a Google App Engine.
13. Write a short note on Hadoop Framework.
14. Write a short note on HDFS.
15. Explain Public Model.
16. What is community cloud.
17. What is AmazonEC2.
18. What is Sales Force.
19. Define Network Security.
20. What isCloud Platform.
21. How to manage contacton cloud.
22. Whatis SAAS
23. What isMAAS.
24. Whats Is DAAS.
25. Write down types of Cloud
26. What is WEB API.
27. What is cloud Storage.
28. Define Broadband Networks.
29. Which I/O Devices are required for Cloud Computing.
30. Write any two Disadvantagesof Cloud Computing.

❖ **Short Answer Questions.**

1) Explain History of Cloud.
2) Explain types of cloud.
3) Write a Short note on Benefits of cloud.
4) Write a short note on cloud storage management
5) Explain IAAS.
6) Explain PAAS.
7) Explain DAAS.
8) Write a short note on MAAS.
9) Explain Broadband Networks.
10) Explain Multitenant Technology.
11) Explain Google App Engine.
12) Write a short note on Map Reduce.
13) Write a short note on Hadoop Framework.
14) Explain Public model.
15) Write note on private model.
16) Write down advantages of Cloud Computing.
17) Write a short note Community Cloud.
18) Write a short note on Cloud Client.
19) Write a short note on Hybrid Model.
20) Explain Web Browser.
21) Explain Cloud storage Providers.
22) Explain Cloud Platforms.
23) Explain Cloud Infrastructure.
24) Write a short note on centralizing Email Communication.
25) Write a short note on Collaborating on calendars.
26) Write a short note on Schedule& Task Management.
27) Explain Features of Cloud
28) Explain Disadvantages of Cloud Computing.
29) Explain Event Management n Cloud.
30) Explain Load Balancing in Cloud.
31) Explain Data Center technology in Cloud Computing.
32) Write a short note on Risk in Cloud Computing.
33) Write a note on Cloud Contact Management.
34) Write a short note on Encryption.
35) Explain Cloud Security.
36) Explain project management in cloud.
37) Explain Hypervisor.
38) What is Virtual Clusters?
39) What is mean by Hypervisor?
40) Write a short note on Resource Management.
41) Write a short note on Virtual Machines.
42) Write a short note on software as a Service.
43) Write a short note on Microsoft Azure.
44) Write a short note on Cloud Services.
45) Explain Virtualization technologies.

❖ **Long Answer Questions.**

1) Explain Cloud Deployment Models.
2) Explain Hybrid Model.
3) Explain Community Model
4) Explain Virtualization.
5) Explain Cloud Platforms.
6) Explain Virtual Machine Provisioning.
7) Write a short note on software as a service.
8) Explain Benefits of Cloud Computing.
9) Explain a short note on Cloud Services.
10) Explain Public model.
11) Explain private model.
12) Explain Community Cloud.
13) Explain Cloud storage Providers.
14) Explain Cloud Infrastructure.
15) Explain centralizing Email Communication.
16) Explain Collaborating on calendars.
17) Explain Schedule& Task Management.
18) Explain Features of Cloud
19) Explain Event Management n Cloud.
20) Explain Load Balancing in Cloud.
21) Explain Data Center technology in Cloud Computing.
22) Explain Challenges and Risk in Cloud Computing.
23) Explain Cloud Contact Management.
24) Explain Cloud Security.
25) Explain project management in cloud.
26) Explain Multitenant technology.
27) Explain Cloud Service providers.
28) Explain IAAS & PAAS in brief.
29) Explain CAAS and MAAS in brief.
30) Explain Network Services.

M.Sc.I Computer Science(Optional) (Semester II)
MCST 203: Cyber Security and Law

Long Questions:-

1. Discuss the types of Cyber Security.
2. What Is SOAP Security? Explain its working.
3. What are the challenges of Internet governance? Explain any one.
4. Discuss National Cyber Security Policy.
5. Explain Intrusion Detection and Prevention System with suitable diagram.
6. Discuss the types of Jurisdiction.
7. Discuss the types of Cyber Attacks.
8. Explain Basic security for HTTP Applications.
9. What are different types of cybersecurity vulnerabilities?
10. Discuss Cyber Security Standards.
11. Explain National Security Policy in brief.
12. Discuss Indian context of Jurisdiction in brief
13. Discuss CIA model in brief.
14. Explain Network based Intrusion detection Systems.
15. Explain Firewall with its working.
16. Discuss need for Cyber Law.
17. Explain Cyber Jurisprudence at Indian Level.
18. Discuss the types of Jurisdiction.
19. Explain Cyber Torts in brief.
20. What is Dispute resolutions?Explain avoidance of Dispute.

Short Questions:-

1. Describe System-based attacks.
2. Explain SOAP security risks.
3. Discuss Indian Cyberspace.
4. Discuss need of Security Policy.
5. Explain Physical Theft.
6. Describe Jurisdiction in Cyber Space.
7. Discuss System Integrity Validation.
8. What is the need of Cyber Law?
9. Explain Identity Theft with example.
10. Describe working of threat management.
11. Explain SOAP Message Transmission.
12. Discuss Computer impact in society.

13. Discuss Address Vulnerabilities.
14. Explain Authorization Patterns.
15. Describe Dispute resolutions in cyberspace.
16. Describe Cyber Terrorism with suitable example.
17. Explain Freedom of speech in cyberspace.
18. Discuss Cyber Torts.
19. Describe Web-based attacks.
20. Explain Identity Management System.
21. Discuss role of International Law.
22. Discuss types of Hacking.
23. Explain SOAP Security with message transmission.
24. Describe Indian context of Jurisdiction.
25. Discuss various kinds of biometrics.
26. Describe any one Web Application Security Challenges.
27. Explain Dispute Resolution in Cyberspace.
28. Discuss Freedom of Speech in Cyberspace.
29. Describe types of Civil Wrongs.
30. Discuss positive and negative impact of computer in society.

Define the Term:-

1. Define the term: Cyber Security.
2. What are the different types of Cyber Attacks?
3. State the term: Web Application Security.
4. Which are different risks in SOAP?
5. What is the role of international law?
6. Which are the different Offenses under the IT Act 2000?
7. Define the term: Cyber Crime.
8. What are the different types of cyber security policies?
9. State the term: SOAP Security.
10. Which are common attacks against web applications?
11. What is the vision of National Cyber Security Policy?
12. Define the term: Patent Law.
13. Define the term: Cyber Threats.

14. What are the different types of Firewall?
15. State the term: Web Application Security.
16. Which are different Intrusion detection and Prevention Techniques?
17. What is mean by Cyberspace?
18. Which are the different types of civil wrongs?
19. State the term:IPR
20. What is mean by Jurisdiction?

M.Sc.-I (Semester-II) Computer Science
Digital Image Processing (MCST-204)
Subject Code: 91508

Q.1) Answer the following questions. **[2 Marks]**

1. Define Image Sampling?
2. Define Quantization?
3. Define pixel.
4. Define Resolutions?
5. What do you meant by zooming of digital images?
6. Explain the term digital image?
7. What is Image?
8. Enlist different applications of Digital Image Processing.
9. Define pixel.
10. Define Digital and Analog Image.
11. Define image sampling.
12. What is feature extraction?
13. Define Histogram?
14. Explain Spatial Filtering?
15. What is Digital Image Processing?
16. Which of the process helps in Image enhancement?
17. What is an example of Digital Image Processing?
18. What is feature extraction?
19. Define Image?
20. What is Dynamic Range?
21. Define Brightness?
22. Define Tapered Quantization?
23. What do you meant by Gray level?
24. What do you meant by Color model?
25. List the hardware oriented color models?
26. What is Hue of saturation?
27. List the applications of color models?
28. What is Chromatic Adoption?
29. Define Resolutions?
30. What is meant by pixel?
31. Define Digital image?
32. What are the steps involved in DIP?
33. What is recognition and Interpretation?
34. Specify the elements of DIP system?
35. Explain the categories of digital storage?
36. What are the types of light receptors?
37. Differentiate photopic and scotopic vision?

38. How cones and rods are distributed in retina?
39. Define subjective brightness and brightness adaptation?
40. Define weber ratio
41. What is meant by machband effect?
42. What is simultaneous contrast?
43. What is meant by illumination and reflectance?
44. Define sampling and quantization
45. Find the number of bits required to store a 256 X 256 image with 32 gray levels?
46. Write the expression to find the number of bits to store a digital image?
47. What do you meant by Zooming of digital images?
48. What do you meant by shrinking of digital images?
49. Write short notes on neighbors of a pixel.
50. Explain the types of connectivity.
51. What is meant by path?
52. Give the formula for calculating D4 and D8 distance.
53. What is geometric transformation?
54. What is image translation and scaling?
55. What is the need for transform?
56. Define the term Luminance?
57. What is Image Transform?
58. What are the applications of transform?
59. Give the Conditions for perfect transform?
60. What are the properties of unitary transform?
61. Define Fourier transform pair?
62. Define Fourier spectrum and spectral density?
63. Give the relation for 1-D discrete Fourier transform pair?
64. Explain separability property in 2D Fourier transform
65. Properties of twiddle factor.
66. Give the Properties of one-dimensional DFT
67. Give the Properties of two-dimensional DFT
68. What is meant by convolution?
69. State convolution theorem for 1D
70. **What are the properties of Haar transform.**

Q.2) Long Answer Questions [6-Marks]

1. Explain biometric and its types.
2. Write note on character recognition.
3. Explain digital image processing.
4. Explain image segmentation.
5. Describe image restoration and operations of image processing.
6. Explain sampling and quantization.
7. Write a note on medical applications of image processing.
8. Explain logical operations and scaling in detail.
9. Describe human visual system.

10. Explain the applications of image processing.
11. Explain Image sensor and acquisition.
12. Describe lossy compression with example.
13. Explain various cooler image processing categories?
14. Write a note on frequency domain enhancement.
15. Describe classification of digital image.
16. Explain the steps of image processing.
17. Describe the operations of image processing.
18. Describe image enhancement in detail.
19. Explain filtering operations.
20. Write a note on DCT and Wavelet transform.
21. Explain Lossy compression, in detail.
22. Explain image segmentation.
23. Write a note on object recognition.
24. Describe feature extraction.
25. Explain pattern and pattern classes.
26. Describe biometric authentication in detail.
27. Write a note on classification of digital image.
28. Describe sampling and quantization with example.
29. Explain advantages and disadvantages of image processing.
30. Write a note on digital image representation.
31. Explain classification of digital image.
32. Describe biometric authentication in detail.
33. Describe the operations of image processing.
34. Explain image histogram with example.
35. Describe image enhancement in detail.
36. Explain filtering operations.
37. Explain pattern and pattern classes.
38. Explain logical operations and scaling in detail.
39. Explain Lossy compression, in detail.
40. Write a note on medical applications of image processing.
41. Explain spatial domain method.
42. Describe human visual system.
43. Explain the types of images according to resolution.
44. Describe the elements of image processing system.
45. Explain content based image retrieval.
46. Derive a Wiener filter for image restoration using minimum mean square Approach. Give the condition in which Wiener filter reduces to an inverse filter

47. Explain the image restoration model
48. Explain the different spatial filtering techniques used in images. Distinguish them with appropriate masks.
49. Give the drawbacks of inverse filtering in image restoration.
50. Write a short note on Lagrange multipliers.
51. Define homomorphic filtering with necessary equations.
52. Explain the region based approaches to image processing.
53. Explain any DCT based image compression scheme. Compare the same with Wavelet based image compression method.
54. Explain how the wavelet transform can be used for image compression.
55. Construct arithmetic coding to encode and decode the word “INDIA”.
56. Explain the methods of thresholding for image segmentation
57. Explain edge detection using gradient operator. Explain edge linking using Hough transform.
58. What is median filtering? Calculate the median value of underlined pixels given below using a 3×3 mask.
59. Specify the objective of image enhancement technique.
60. Explain the negative and log transformation.

Q.1) 2 Marks

1) Define Vector Space.
2) Define Correlation.
3) Define Subspace of vector space.
4) Define Regression.
5) Define Homomorphism.
6) Define Population and Sampling.
7) Define Direct Sum.
8) Define Error in test of significance.
9) Define Level of Significance.
10) Define mean for normal distribution.
11) Define Variance for Poisson distribution.
12) Define Linear Span.

Q.2), 3) & 4) 6 Marks

1) If $Hom(U,V)$ is the set of all homomorphisms from $u\ to\ v.\ i.e. Hom(U,V) = \{T/T: U \to V\ \&\ T\ is\ linear\}$ then show that $Hom(U,V)$ is vector space over field $\mathbb{F}$.
2) Define Karl Pearson's coefficient of correlation and Spearman's rank Correlation coefficient. Derive an expression for rank correlation coefficient in case of without ties.
3) Define Karl Pearson's coefficient of correlation and show that it lies between -1 and 1.
4) Explain the term Regression and derive the equation of the line of regression of Y on X by the least square method.
5) Explain the term Regression and derive the equation of the line of regression of X on Y by the least square method.
6) If $Hom(V,\mathbb{F})$ is the set of all linear functional on $v.\ i.e. Hom(V,\mathbb{F}) = \{f/f: V \to \mathbb{F}\ \&\ f\ is\ linear\}$ then show that $Hom(V,\mathbb{F})$ is vector space over field $\mathbb{F}$.
7) Describe the procedure for testing $H_0: \mu = \mu_0$ and $H_0: \mu_1 = \mu_2$ based on normal distribution.
8) Write a program for random number generation to Poisson distribution.

9) Write a program for random number generation to Normal distribution.

10) If V and W are finite dimensional vector space of field $\mathbb{F}$ of dimension $m\ and\ n$ respectively then show that $dim(Hom\ (V,W)) = m.n$

11) If U & V are vector field $\mathbb{F}$ and $\{\alpha_1, \alpha_2, \dots\dots, \alpha_n\}$ is basis of v and $\{\beta_1, \beta_2, \dots\dots, \beta_n\}$ is basis of v then show that $T: U \to V$ is unique linear transformation such that $T(\alpha_i) = \beta_i\ ; 1 \le i \le n$

12) If V be vector space over field $\mathbb{F}$ and $\{\alpha_1, \alpha_2, \dots\dots, \alpha_n\}$ be a basis of V and $(a_1, a_2, \dots\dots, a_n) \in \mathbb{F}$ then show that $f: U \to V$ is unique linear transformation such that $T(\alpha_i) = \beta_i\ , \forall\ i = 1,2, \dots, n$

13) If V is finite dimensional vector space over field $\mathbb{F}$ and W is subspace of V then show that $\dim V = \dim W + \dim A(W)$

14) Show that $Hom(U,V)$ is vector space over field $\mathbb{F}$ if $Hom(U,V)$ is the set of all homomorphisms from $u\ to\ v.\ i.e. Hom(U,V) = \{T/T: U \to V\ \&\ T\ is\ linear\}$.

15) Show that $Hom(V,\mathbb{F})$ is vector space over field $\mathbb{F}$ if $Hom(V,\mathbb{F})$ is the set of all linear functional on $v.\ i.e. Hom(V,\mathbb{F}) = \{f/f: V \to \mathbb{F}\ \&\ f\ is\ linear\}$.

16) Show that $dim(Hom\ (V,W)) = m.n$ if V and W are finite dimensional vector space of field $\mathbb{F}$ of dimension $m\ and\ n$ respectively.

17) Show that $T: U \to V$ is unique linear transformation such that $T(\alpha_i) = \beta_i\ ; 1 \le i \le n$ if U & V are vector field $\mathbb{F}$ and $\{\alpha_1, \alpha_2, \dots\dots, \alpha_n\}$ is basis of v and $\{\beta_1, \beta_2, \dots\dots, \beta_n\}$ is basis of v.

18) Show that $f: U \to V$ is unique linear transformation such that $T(\alpha_i) = \beta_i\ , \forall\ i = 1,2, \dots, n$ if V be vector space over field $\mathbb{F}$ and $\{\alpha_1, \alpha_2, \dots\dots, \alpha_n\}$ be a basis of V and $(a_1, a_2, \dots\dots, a_n) \in \mathbb{F}$.

19) show that $\dim V = \dim W + \dim A(W)$ if V is finite dimensional vector space over field $\mathbb{F}$ and W is subspace of V.

20) Explain Karl Pearson's coefficient of correlation and Spearman's rank Correlation coefficient. Derive an expression for rank correlation coefficient in case of without ties.

21) Explain Karl Pearson's coefficient of correlation and show that it lies between -1 and 1.

22) Define the term Regression and derive the equation of the line of regression of Y on X by the least square method.

23) Explain the procedure for testing $H_0: \mu = \mu_0$ and $H_0: \mu_1 = \mu_2$ based on normal distribution.

24) Write down the program for random number generation to Poisson distribution.

25) Write down the program for random number generation to Normal distribution.

Q.5), 6) & 7) 4 Marks

1) State and prove effect of change of origin and scale on Karl Pearson's Coefficient.
2) Write a short note on Scatter diagram method of studying the correlation.
3) Prove that Karl Pearson's correlation coefficient always lies between -1 to 1.
4) If $V = W_1 + W_2$ & $W_1 \cap W_2 = (0)$ then show that $V = W_1 \oplus W_2$.
5) Derive the expression for acute angle between the regression lines.
6) If V is Finite dimensional vector space over $\mathbb{F}$ then show that $\dim v = \dim \hat{v}$.
7) Explain the concept of p-value.
8) If V is Finite dimensional vector space over $\mathbb{F}$ and $\{\alpha_1, \alpha_2, \dots \dots, \alpha_n\}$ is basis of v and $\{f_1, f_2, \dots \dots, f_n\}$ is basis of $\hat{v}$ then show that $f = \sum_{i=1}^{n} f(\alpha_i)\, f_i$ and $\alpha = \sum_{i=1}^{n} f_i(\alpha_i)\, \alpha_i$ for any $f \in \hat{v}$ and $\alpha \in v$.
9) Calculate Spearman's rank correlation coefficient between advertisement cost and sales from the following data:

Advertisement cost (in thousand):	39	65	62	90	82	75	25	98	36	78
Sales (lakes):	47	53	58	86	62	68	60	91	51	84

10) Show that linear functional $f \in \hat{v}$ such that $f(v) \neq 0$ if V be finite dimensional vector space over $\mathbb{F}$ and $v \neq 0$ in V.
11) Explain the concept of hypothesis.
12) If V is finite dimensional vector space over $\mathbb{F}$ then show that $v \cong \hat{v}$
13) Define Type I and Type II error. Explain with suitable example.
14) If V be finite dimensional vector space over $\mathbb{F}$ then show that each basis of $\hat{v}$ is dual basis of v.
15) Define Mean and Variance of Geometric Distribution.
16) If V be finite dimensional vector space over $\mathbb{F}$ and L is linear functional on $\hat{v}$ then show that there is unique $\alpha \in V$ such that $L(f) = f(\alpha)$.
17) If V be finite dimensional vector space over $\mathbb{F}$ and W is subspace of V then show that $\frac{\hat{v}}{A(W)} \cong \hat{w}$ *or* $\dim\left(\frac{\hat{v}}{A(W)}\right) = dim(\hat{w})$.

18) If V be finite dimensional vector space over $\mathbb{F}$ and $v \neq 0$ in V then show that linear functional $f \in \hat{v}$ such that $f(v) \neq 0$.

19) Explain Type I and Type II error with suitable examples.

20) If there is unique $\alpha \in V$ such that $L(f) = f(\alpha)$ and V be finite dimensional vector space over $\mathbb{F}$ then show that L is linear functional on $\hat{v}$.

21) Show that Karl Pearson's correlation coefficient always lies between -1 to 1.

22) Explain Mean and Variance of Geometric Distribution.

23) If each basis of $\hat{v}$ is dual basis of v then show that V be finite dimensional vector space over $\mathbb{F}$.

24) If $f = \sum_{i=1}^{n} f(\alpha_i)\, f_i$ and $\alpha = \sum_{i=1}^{n} f_i(\alpha_i)\, \alpha_i$ for any $f \in \hat{v}$ and $\alpha \in v$ and V is Finite dimensional vector space over $\mathbb{F}$ then show that $\{\alpha_1, \alpha_2, \dots\dots, \alpha_n\}$ is basis of v and $\{f_1, f_2, \dots\dots, f_n\}$ is basis of $\hat{v}$.

25) If $W_1 \cap W_2 = (0)$ & $V = W_1 + W_2$ then show that $V = W_1 \oplus W_2$.

26) Write down the expression for acute angle between the regression lines.

27) If $\frac{\hat{v}}{A(W)} \cong \hat{w}\ or\ \dim\left(\frac{\hat{v}}{A(W)}\right) = dim(\hat{w})$ and V be finite dimensional vector space over $\mathbb{F}$ then show that W is subspace of V.

28) Write a short note on concept of p-value.

29) Write a short note on Mean and Variance of Geometric Distribution.

30) Define the concept of hypothesis.