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PGIIS-N-873 A-21

M.C.A. (3 Years Course) III Semester (CBCS) Degree Examination

COMPUTER SCIENCE

Python Programming

Paper : MCA 31 T

(New Syllabus)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

- 1) Answer any **five** questions.
- 2) All Questions carry **equal** Marks.
1. a) Explain the various Data types in python. (8)
b) What are the different ways to declare variables in python? Explain (8)
2. a) With an example Explain return statement using function. (8)
b) Explain Expressions and values used in python. (8)
3. a) What is Boolean type ? With example for each, discuss Boolean operators. (8)
b) Create a student list (id, name and percentage) using class and objects. (8)
4. a) Briefly explain how to create and access Packages in python. (8)
b) Define List, Explain the following methods with examples. (8)
i) min() ii) max() iii) cmp() iv) len()
5. a) What are the different methods to delete an item in a list? Explain. (8)
b) Explain the different types of formal arguments using which a function can be called. Give an example for each. (8)
6. a) With an example explain looping over a range of numbers. (8)
b) Briefly explain nested loops with an example for each. (8)

7. a) What are the steps to Create GUI application? Explain any one widget. (8)
b) Briefly discuss class object and class book. (8)
8. Write notes on any **two** of the following (2×8=16)
- a) Operations on sets
 - b) Constructor
 - c) Aliasing list
 - d) GUI Mess
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PGIIS-N-881 A-21
M.C.A. (3 Years Course) III Semester (CBCS) Degree Examination
COMPUTER SCIENCE
Cloud Computing
Paper : MCA 36T
(New Syllabus)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

- 1) Answer any **Five** questions.
 - 2) All Questions carry **Equal** Marks.
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1. a) Explain cloud deployment models with a neat diagram. (8)
b) Explain different cloud service models with a neat diagram. (8)
 2. a) Explain various applications of cloud computing. (8)
b) With a neat diagram, explain MS Windows AZURE architecture. (8)
 3. a) Explain the architectural styles for cloud applications. (8)
b) With a neat diagram, explain The Zookeeper Coordination service. (8)
 4. a) With a neat diagram, explain the Grep The Web application. (8)
b) Explain loosely coupled workloads using Azure platform. (8)
 5. a) With a neat diagram, explain taxonomy of process and system VMs. (8)
b) Explain the types of virtualization process. (8)
 6. a) With a neat diagram, explain Xen for x86 architecture. (8)
b) Explain Virtual Machine Based Rootkit. (8)
 7. a) With a neat diagram, explain a two level control architecture. (8)
b) Explain utility based model for cloud-based web services. (8)
 8. Write notes on any **Two** of the following. (2×8=16)
 - a) Open source cloud platforms.
 - b) The MapReduce philosophy.
 - c) Xen network and optimize architecture.
 - d) Cloud resource management policies and mechanisms.

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PGIIS-N-875 A-21

M.C.A. (3 Years Course) III Semester (CBCS) Degree Examination

COMPUTER SCIENCE

Design & Analysis of Algorithms

Paper : MCA32T

(New Syllabus)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

- 1) Answer any **Five** questions.
- 2) All Questions carry **Equal** Marks.

1. a) Discuss the importance of asymptotic notations in analyzing an algorithm. (8)
- b) Calculate the time complexity of computing GCD(a,b) using Euclid's algorithm. (8)
2. a) What are space and time complexities of an algorithm? Explain how would you compute the time and space complexity of recursive algorithms. (8)
- b) Write a recursive algorithm to find a^n . Using backward substitution method compute the time taken by recursive algorithm. (8)
3. a) Apply selection sort to the following instance of an array {45, 23, 89, 10, 11, 27, 38}. Compute the worst-case time complexity of this algorithm. (8)
- b) Write a recursive algorithm to search for a key element in an array of size n derive an equation for the best-case and worst case complexity of your algorithm. (8)
4. a) Write an algorithm for find a key in ordered list using binary search technique. Trace the algorithm for [10,9,8,7,6,5] and key = 5 (8)
- b) Using divide-and-conquer method find the maximum and minimum elements in an array. (8)
5. a) Discuss the time complexities of DFS and BFS methods. (8)
- b) Using DFS method, write an algorithm to check whether a graph is acyclic or not. (8)

6. a) Explain how comparison counting sort methods works. Write an algorithm for the same. (8)
- b) Write a Horspool algorithm to search for a given pattern in a text. Trace the algorithm with the following string:
- Text : KALBURGI IS A HOT CITY
- Pattern : HOT (8)
7. a) Discuss the meaning for memory function. Give the example of 0/1 Knapsack problem to explain the memory functions. (8)
- b) Write an algorithm to compute the binomial coefficient of two positive integers based on dynamic programming. (8)
8. Write notes on any **Two** of the following. (2×8=16)
- a) Brute force.
- b) Binary tree.
- c) Topological sorting.
- d) n-Queens problem.
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PGIIS-O-874 A-21
M.C.A III Semester Degree Examination
COMPUTER SCIENCE
Software Engineering
Paper : MCA3.1
(Old Syllabus)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

- 1) Answer any **Five** questions.
 - 2) All Questions carry **equal** Marks.
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1. a) What is software engineering? What are the fundamental software engineering process activities? (8)
 - b) What is software process model? Explain Spiral software process model. (8)
 2. a) Explain water fall model with its merits and demerits. (8)
 - b) Explain the requirement elicitation and analysis process with neat diagram. (8)
 3. a) Describe the metrics for the design model of a product. What are the attributes of effective software metrics? (8)
 - b) Explain the requirements engineering process, with a neat block diagram. (8)
 4. a) Explain with figure, the data flow model of an invoice processing system. (8)
 - b) Define DFD? Explain its role in structured analysis. (8)
 5. a) Explain in detail the tools used for analysis of any software system. (8)
 - b) Discuss the various phases of design process. (8)
 6. a) What is the use of testing? What are the various testing strategies? Discuss the relevance of it. (8)
 - b) How verification is different from validation? Discuss Integration testing. (8)

7. a) With a neat diagram explain the object oriented decomposition for invoice processing sub-system. (8)
- b) What are the three kinds of objects used in object oriented design? Explain. (8)
8. Write short note on any **Two**: (2×8=16)
- a) Prototyping Model
- b) White Box Testing
- c) Data Dictionary
- d) Architectural Design.
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PGIIS-O-876 A-21
M.C.A. III Semester Degree Examination
COMPUTER SCIENCE
Data Communication and Computer Networks
Paper : MCA 3.2
(Old)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

- 1) Answer any **five** questions.
 - 2) All Questions carry **equal** Marks.
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1. a) With a neat diagram explain the architecture of OSI reference model. (8)
b) What is communication? With a neat diagram, discuss the components of a communication model. (8)
 2. a) What is transmission impairment in data communication? Explain each briefly. (8)
b) With a neat diagram, explain the operation of SNP & wait ARQ. (8)
 3. a) With a neat diagram explain the protocol architecture of LAN. (8)
b) Define topology. Explain the different types of topologies with neat diagram. (8)
 4. a) Discuss the working of Link state routing algorithm. (8)
b) Define the term internetwork. Explain the principles of internetworking. (8)
 5. a) Explain message authentication and hash function. (8)
b) List the different types of attacks and explain in detail. (8)
 6. a) Explain public key encryption in detail. (8)
b) Discuss in detail Time-Division Multiplexing and Frequency-Division Multiplexing with an example for each. (8)

7. a) Write about how the integrity of message is ensured without source authentication. (8)
- b) Describe congestion control in packet switched network. (8)
8. Write notes on any **two** of the following (2×8=16)
- a) Signal encoding techniques
- b) Layer 2 and Layer 3 switches.
- c) Client server interaction.
- d) IPV4 and IPV6 Security.
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PGIIS-O-878 A-21
M.C.A III Semester Degree Examination
COMPUTER SCIENCE
Computer Graphics
Paper : MCA3.3
(Old Syllabus)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

- 1) Answer any **Five** questions.
 - 2) All Questions carry **equal** Marks.
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1. a) What is Computer Graphics ? Explain the procedure for lines and polylines in SRGP. (8)
b) Explain graphics hardware in detail. (8)
 2. a) Write the detail procedure for pattern filling. (8)
b) Discuss basic raster graphics algorithm for dipping lines in 2D primitives. (8)
 3. a) What is 2D transformation? Describe the homogeneous co-ordinates with example.(8)
b) Explain in detail matrix representation in 2D transformation. (8)
 4. a) Write differences between 2D and 3D transformation. Describe viewing in 3D in detail. (8)
b) Discuss briefly the bazier curves. (8)
 5. a) What are the three basic polygon meshes involves in computer graphics. (8)
b) Briefly describe parametric cubic and bicubic curves. (8)

6. a) Write the Pseudo code for Z-buffer algorithm. (8)
b) Explain in detail scan-line algorithm. (8)
7. a) What are the problem with interpolated shading. (8)
b) Describe any two solid modelling representation. (8)
8. Write notes on any **Two** of the following: (2×8=16)
- a) User Interface Software.
 - b) Visible surface ray tracing.
 - c) Transparency.
 - d) Antialiasing.
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PGIIS-O-882 A-21
M.C.A III Semester Degree Examination
COMPUTER SCIENCE
Visual Programming
Paper : MCA 3.5
(Old Syllabus)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

- 1) Answer any **Five** questions.
 - 2) All Questions carry **equal** Marks.
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1. a) What is new in VB.Net? Explain the assemblies and class libraries. (8)
b) Briefly explain the Environment in VB.Net. (8)
 2. a) Explain the IDE of VB.Net with toolbox, properties window and form designer. (8)
b) Define arrays in VB.Net. Explain types of array and control array. (8)
 3. a) Describe loop statements in VB.Net. (8)
b) How to declaring variable in VB.Net with suitable example (8)
 4. a) Explain Properties and methods of combobox. (8)
b) Explain how to controlling one form within another with example. (8)
 5. a) Illustrate the following (8)
i) Overloading
ii) Classes and objects
b) Briefly explain the overview of OLE. (8)
 6. a) How to access COM components in .NET application? (8)
b) Explain accessing data using server explorer. (8)
 7. a) Explain the various commands of ADO.NET. (8)
b) How to display data on bound controls and data grid ? (8)

8. Write notes on any **Two** of the following

(2×8=16)

- a) Designing menus
 - b) Methods and events in OOP
 - c) SQLDB
 - d) Format Tab
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PGIIS-N-877 A-21
M.C.A. (3 Years Course) III Semester Degree Examination
COMPUTER SCIENCE

Computer Oriented Statistical Methods.

Paper : MCA 33T

(New Syllabus)

Time : 3 Hours

Maximum Marks : 80

- Instructions to Candidates:**
- 1) Answer any **Five** questions.
 - 2) All questions carry **Equal** Marks.

1. a) Define classification. Explain its types with examples. (8+8)

b) The time between successive failures of an electronic system is observed over time and the data is Summarized in the following table.

Time	:	0-30	30-60	60-90	90-120	120-150	150-180
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between successive

failures (in minutes)

No. of failures	:	12	25	47	18	12	11
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Compute the arithmetic mean and the standard deviation.

2. a) Explain (8+8)

i) Correlation.

ii) Linear regression.

b) Following data shows CPU time required (y) and no. of disk I/O operations (x) performed compute correlation coefficient between them.

x:	398	390	410	502	590	305	210	252	398
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y:	40	38	42	50	60	30	20	25	40
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3. a) State and prove Baye's theorem. (8+8)
- b) A group of four integrated circuit (IC) chips consists of two good chips and two defective chips. If three chips are to be selected at random from this group, what is the probability that two of the three selected chips are defective ?
4. a) Define Poisson distribution. Show that mean and variance of this distribution are same. (8+8)
- b) The length of telephone conversation in a booth has an exponential distribution and found on an average to be 5 minutes. Find the probability that a random call made from this booth.
- i) Ends less than 5 minutes.
- ii) Between 5 to 10 minutes.
5. a) Explain Sampling distribution of mean with an example. (8+8)
- b) A company which sells computers and computer parts claims that atleast 90% of all orders are mailed within 72 hours after they are received. The quality control department at the company offer takes samples to check if this claim is valid. A sample of 150 orders showed that 129 of them were mailed within 72 hours. Test whether the company's claim is true at 5% level of significance.
6. a) Explain the following terms: (8+8)
- i) Null hypothesis.
- ii) Types of error.
- iii) Critical region.
- iv) Level of significance.
- b) For the following data, test whether mean weight a group I is greater than that of group II

	Group I	Group II
Sample size	7	5
Mean	50 kg	48 kg
Variance	5 kg ²	3 kg ²

7. a) Explain the procedure for testing the equality of means of two normal populations with known variances. **(8+8)**
- b) A teacher wishes to test three different teaching methods A,B,C. To do this, three groups of 5 student's were chosen at random and each group is taught by a different method. A common examination was later given to all the students and the marks out of 100, scored by them are tabulated. Determine whether there is a significant difference in teaching methods at 5% level of significance.

Methods	A	75	62	71	58	73
	B	81	85	68	92	90
	C	73	79	60	75	81

8. Write notes on any **Two** of the following. **(8+8)**
- a) Measures of central tendering.
- b) Normal distribution.
- c) Binomial distribution
- d) F - test.
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