# उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय, प्रयागराज

अधिन्यास 2019–20

## Under Graduate Computer Programme (UGCS)

| कोर्सकोड :<br>Course Code: **UGCS-01** | कोर्स शीर्षकः– (Course Title)<br>**Computer Fundamental** | अधिकतमअंक : 30<br>**Maximum Marks : 30** |
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खण्ड अ अधिकतम अंक : 18

**Section-A** **Maximum Marks : 18**

नोट– **(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words.**

1. Differentiate RISC Vs CISC architecture.
2. What is an instruction format? Explain different types of instruction formats in detail.
3. What is a Decoder? Compare a decoder and a demultiplexer with suitable block diagrams.

खण्ड ब अधिकतम अंक : 12

**Section –B** **Maximum Mark : 12**

नोट– **(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words.**

1. Explain Flynn's classification of computers.
2. Explain how concurrency is implemented in SISD?
3. Explain the importance of different addressing modes in computer architecture withsuitable example.
4. Explain in detail the different stages of a RISC pipeline.

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## Under Graduate Computer Programme (UGCS)

| कोर्स कोड :<br>Course Code: **UGCS-03** | कोर्स शीर्षकः– (Course Title)<br>**Introduction to System Software** | अधिकतम अंक : 30<br>**Maximum Marks : 30** |
|---|---|---|

खण्ड अ              अधिकतम अंक : 18

**Section-A**            **Maximum Marks : 18**

नोट– **(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words.**

1. What do you mean by Compiler? Discuss the step to design a compiler.
2. What do you mean by system software? Explain in details types of software.
3. How is a process different from a program? What information is contained within a Process Control Block (PCB)?
4.

खण्ड ब              अधिकतम अंक : 12

**Section –B**            **Maximum Mark : 12**

नोट– **(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words.**

1. What do you mean by two pass assembler?
2. List the functions of System table.
3. Explain the function of Loader.
4. What do you mean by process? Discuss the different state of a process.

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## Under Graduate Computer Programme (UGCS)

| कोर्स कोड : <br> Course Code: **UGCS-04** | कोर्स शीर्षकः— (Course Title) <br> **'C' Programming** | अधिकतम अंक : 30 <br> **Maximum Marks : 30** |
|---|---|---|

खण्ड अ           अधिकतम अंक : 18

**Section-A**           **Maximum Marks : 18**

नोट— **(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words.**

1. The two matrix A (NXN) and B (NXN) of following numbers are given. Write the program in C language to find the multiplication of the transpose of A and B i.e. AT X BT.

2. What is a structure? Create a suitable structure for storing the information about the Technical Institutions in India (Assume appropriate attributes to store the information). List all the institutes for a given state.

3. What is the advantage of switch statement over if-else statement? Write a program in C using switch statement to find the value of Y for a given value of N between 1 and 4.

| if N =1 | Y = (ax+b)2 |
|---|---|
| if N = 2 | Y = ax2+b3 |
| if N=3 | Y= -ax+b |
| if N=4 | Y=a2+x |

खण्ड ब           अधिकतम अंक : 12

**Section –B**           **Maximum Mark : 12**

नोट— **(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words.**

1. Write a short note on call by value and call by reference parameter passing method with example.
2. Write the C programme to find out the length of string without using the string function.
3. Write the step to run the C programme in UNIX.
4. What do you mean by union in C?

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## Under Graduate Computer Programme (UGCS)

| कोर्सकोड :<br>Course Code: **UGCS-06** | कोर्स शीर्षकः– (Course Title)<br>**DBMS** | अधिकतमअंक : 30<br>**Maximum Marks : 30** |
|---|---|---|

खण्ड अ                                                                                           अधिकतम अंक : 18

**Section-A**                                                                              **Maximum Marks : 18**

नोट– **(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words.**

1. What is entity and attribute? Give some examples of entities and attributes in a manufacturing environment. Why are relationships between entities important?
2. What do you mean by data redundancy? What is the difference between controlled redundancy? What is data independence?
3. Suppose you are given the following requirements for a simple database for the National Hockey League (NHL):

a. the NHL has many teams,
b. each team has a name, a city, a coach, a captain, and a set of players,
c. each player belongs to only one team,
d. each player has a name, a position (such as left wing or goalie), a skill level, and a set of injury records,
e. a team captain is also a player,
f. a game is played between two teams (referred to as host_team and guest_team) and has a date (such as May 11th, 1999) and a score (such as 4 to 2).

Construct a clean and concise ER diagram for the NHL database and transform the E-R diagram to a Relational Schema.

खण्ड ब                                                                                           अधिकतम अंक : 12

**Section –B**                                                                             **Maximum Mark : 12**

नोट– **(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words.**

1. Explain how the Boyce-Codd normal form differs from that of 3NF.
2. Explain the various ways in which concurrency control can be implemented in a database.
3. What is data? What do you mean by information? What are the differences between data and information?
4. Who is a DBA? What are the responsibilities of a DBA?

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## Under Graduate Computer Programme (UGCS)

| कोर्स कोड :<br>Course Code: **UGCS-07** | कोर्स शीर्षकः— (Course Title)<br>**System Analysis and Design** | अधिकतम अंक : 30<br>**Maximum Marks : 30** |
|---|---|---|

खण्ड अ                                      अधिकतम अंक : 18

**Section-A**                                     **Maximum Marks : 18**

नोट— **(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words.**

1. Explain prototype model of software development. Is prototype model a suitable
2. Model for courier company management system? Justify your answer.
3. What is function point analysis? List four features of it.
4.

खण्ड ब                                      अधिकतम अंक : 12

**Section –B**                                     **Maximum Mark : 12**

नोट— **(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words.**

1. List any five responsibilities of a System Analyst.
2. What is coupling and Cohesion? What are the different type of Cohesion?
3. Differentiate between decision table and decision tree.
4. What are the attributes of good analyst?

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## Under Graduate Computer Programme (UGCS)

| कोर्स कोड :<br>Course Code: **UGCS-08** | कोर्स शीर्षकः– (Course Title)<br>**Discrete Mathematics** | अधिकतम अंक : 30<br>**Maximum Marks : 30** |
|---|---|---|

खण्ड अ                                                              अधिकतम अंक : 18

**Section-A**                                                       **Maximum Marks : 18**

नोट– (Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words.

1. A relation R on the set A = [1, 2, 3, 4] given by
   R = [(1, 1), (1, 2), (2, 2), (3, 1), (3, 2), (3, 3), (4, 2), (4, 4)]
   Represent it by a digraph and show in-degree and out degree of each vertex.

2. Place that conditional operation distributes over conjunction
   $P \Rightarrow (q \vee v) \equiv (P \Rightarrow q) \vee (P \Rightarrow v)$

3. Show that the statement
   $(p \wedge q) \Rightarrow (P \vee q)$ is a tautology but $(P \vee q) \Rightarrow (P \wedge q)$ is not a tautology.

खण्ड ब                                                              अधिकतम अंक : 12

**Section –B**                                                      **Maximum Mark : 12**

नोट– (Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words.

1. Given the following statements as premises all referring to an arbitrary meal:
   (a) If he takes coffee, he does not drink milk.
   (b) He eats crackers only if he drink milk.
   (c) He does not take soup unless he eats crackers.
   (d) At noon today, he had coffee.
   Whether he took soup at noon today? If so, what is the correct conclusion?

2. Show that $[P \rightarrow (q \rightarrow r)] [(p \rightarrow q)(p \rightarrow r)]$ is a tautology.

3. Explain the concept of Isomorphic Graphs.

4. Define Hamiltonian graph along with its properties.

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## Under Graduate Computer Programme (UGCS)

| कोर्स कोड : <br> Course Code: **UGCS-09** | कोर्स शीर्षकः– (Course Title) <br> **Computer Network** | अधिकतम अंक : 30 <br> **Maximum Marks : 30** |
|---|---|---|

खण्ड अ                                                                                   अधिकतम अंक : 18

**Section-A**                                                              **Maximum Marks : 18**

नोट– **(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words.**

1. What do we mean by Multiplexing? Explain the three different types of multiplexing techniques.
2. Explain the OSI reference model with the help of a diagram. Give brief description of each layer of the model.
3. Assume message M: 1010101010 bits and generator G: 10001 bits. Explain how CRC is used for error detection using above message bits and generator bits.

खण्ड ब                                                                                   अधिकतम अंक : 12

**Section –B**                                                              **Maximum Mark : 12**

नोट– **(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words.**

1. Differentiate between the packet switching and Circuit Switching.
2. Explain the working of Distance Vector Routing using an example.
3. List the protocols used for host to host communication in the transport layer of TCP/IP model. What are the important differences between these two protocols?
4. Differentiate between multicast addressing and unicast addressing.

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## Under Graduate Computer Programme (UGCS)

| कोर्स कोड :<br>Course Code: **UGCS-11** | कोर्स शीर्षकः– (Course Title)<br>**C++ and Object oriented programming** | अधिकतम अंक : 30<br>**Maximum Marks : 30** |
|---|---|---|

खण्ड अ अधिकतम अंक : 18

**Section-A** **Maximum Marks : 18**

नोट– **(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words.**

1. Highlight the difference between pure virtual functions and virtual function.
2. Write a program using a try block to detect and throw an exception if the condition "divide by zero" occurs.
3. Explain why Object Oriented Programming approach is better than Structured Programming Approach.

खण्ड ब अधिकतम अंक : 12

**Section –B** **Maximum Mark : 12**

नोट– **(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words.**

1. What is reusability? Which things can be reused?
2. What is friend function? How it is implemented in C++ ?
3. What is template? Explain with suitable example.
4. What are different types of inheritance?

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## Under Graduate Computer Programme (UGCS)

| कोर्स कोड :<br>Course Code: UGCS-17 | कोर्स शीर्षकः– (Course Title)<br>Operation Research | अधिकतम अंक : 30<br>Maximum Marks : 30 |
|---|---|---|

खण्ड अ                                अधिकतम अंक : 18

**Section-A**                            **Maximum Marks : 18**

नोट– **(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words.**

1.  Write a detailed note on classification of models used in operations research.
2.  What is a transportation problem? How could it be considered as LPP? Also, show that number of basic variables in a transportation problem of order m x n, are at the most m+ n -1
3.  "Ram can buy young hens at Rs. 150 each and old hens at Rs. 120 each. The old hens lay 3 eggs per week and the young ones lay 5 eggs per week, each egg being worth Rs. 4. If any hen costs Rs. 10 per week to feed and Ram has only Rs. 3600 to spend for hens, how many of each kind should Ram buy to give a profit of more than Rs. 70 per week, assuming that Ram cannot house more than 25 hens." Formulate this problem and solve graphically.

खण्ड ब                                अधिकतम अंक : 12

**Section –B**                            **Maximum Mark : 12**

नोट– **(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words.**

1.  What is a dual problem? How do we get a dual of given primal?
2.  State and prove reduction theorem for assignment problems.
3.  Soles the following LPP graphically (give all steps).
    Max . $Z = 3 x + 2y$, subject to $x-y \leq 1$, $x+ y \geq 3$ and $x , y \geq o$ .
4.  Write a brief note on phases of OR problem.