Post Graduate Diploma in Computer Application
EXAMINATION 2020

SCHEME OF EXAMINATION

AND

SYLLABUS

FACULTY OF COMPUTER

Post Graduate Diploma in Computer Application
EXAMINATION 2020

महाराजा गंगा सिंह विश्वविद्यालय बीकानेर

Maharaja Ganga Singh University, Bikaner

Post Graduate Diploma in Computer Application
EXAMINATION 2020
SCHEME OF EXAMINATION

1. **ELIGIBILITY FOR ADMISSION**

   Graduates possessing 40% marks in any faculty of any statutory university shall be eligible for admission to the PGDCA Course. (Relaxation to SC/ST etc. as per Government/University Rules)

2. **PASS CRITERIA**

   The examinee has to secure at least 36% marks to pass the examination and 25% marks in each individual paper. Even if he/she will be failed in one paper/course, he/she will be declared fail. She/he however should be allowed one more chance to take the examination as Ex-student. In such a case, the marks of practical/ tutorials etc shall be carried forward for the said purpose.

3. **CLASSIFICATION OF SUCCESSFUL CANDIDATE**

Division	Total Marks
First Division	60% and above
Second Division	Above 48% and below 60%
Pass	Above 36% and below 48%
Fail	Below 36%

4. **INSTRUCTIONS TO PAPER SETTER**

   The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus).The word limit of part A, B and C are 50, 200 and 500 respectively

5. **WORKLOAD**

   At least 3 classes for theory class and 3 classes for practical lab should be assigned per week for each paper.

6. **INSTRUCTIONS FOT PRACTICAL EXAMINATION**

   Marks Distribution for Practical Exam -

   Each practical exam is to be conducted by two examiners one External and one Internal. External examiner should be senior lecturer from jurisdiction of MGS University. External examiner will prepare question paper of Practical Examination. Students have to perform exercise on computer. Exercise must be written in answer books in proper documentation.

   Marks distribution for Practical of 50 marks is as under

i) Three Exercise of 10 marks each	30 Marks
(Logic 04, Execution 03, Documentation 03)	
ii) Viva-Voce	10 Marks

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iii) Laboratory Exercise File	10 marks

Marks distribution for Project of 100 marks is as under

i) Project Dissertation and Presentation	75 marks
ii) External Viva Voce	25 marks

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Teaching and Examination scheme

Paper	Paper Name(Theory)	Lect/ week	Tuto/ week	Exam Hours	Max. Marks	Min. Pass. Marks
Theory Papers						
PGDCA-101	Computer Organization	3	1	3	50	**13** (25%)
PGDCA-102	Programming with C++	3	1	3	50	**13** (25%)
PGDCA-103	Database System	3	1	3	50	**13** (25%)
PGDCA-104	Operating System	3	1	3	50	**13** (25%)
PGDCA-105	Computer Networks	3	1	3	50	**13** (25%)
Total of Theory Papers					**250**	**90** (36% aggregate)
Paper Name (Practical)						
PGDCA-106	Research Project/ Case Study	3	1	3	100	**25** (25%)
PGDCA107	C++ Lab	3		3	50	**13** (25%)
PGDCA 108	DBMS Lab	3		3	50	**13** (25%)
Total of Practical Papers					**200**	**72** (36% aggregate)
Grand Total (Theory 250 + Practical 200)					**450**	**162** (36% aggregate)

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Paper Code: PGDCA-101

Paper Name : Computer Organization

Scheme of Examination

Maximum Marks: 50   Duration: 3 Hours

Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively.

Unit I

Components of a Computer: Processor, Memory, Input-Output Unit, Difference between Organization and Architecture, Hardware Software Interaction. **Number System:** Concept of Bit and Byte, types and conversion. **Complements:** 1's complement, 2's complement. **Binary Arithmetic:** Addition, overflow, subtraction, multiplication (booth's algorithm) and division algorithm.

Unit II

Logic gates: Boolean Algebra, Map Simplification. **Combinational circuits**: Half Adder, Full Adder, Decoders, Multiplexers. **Sequential circuits:** Flip Flops- SR, JK, D, T Flip-Flop.

Unit III

Input Output Organization: Peripheral devices, I/O Interface, Asynchronous Data Transfer, Modes of Data Transfer, Direct Memory Access, I/O Processor.

Unit IV

Memory Organization: Types and capacity of Memory, Memory Hierarchy, Cache Memory, Virtual Memory.

Unit V

Intel 8085 Microprocessor: Introduction, ALU, Timing and Control Unit, Register Set, Data and Address Bus, Addressing modes, Complete Intel 8085 Instruction set, Instruction format, Opcode and Operand, Word Size, Intel 8085 programs.

Suggested Readings

1. Computer System Architecture, By M. Morris Mano (Pearson, Prentice Hall)

2. Carter Nicholas, "Computer Architecture", Schaun outline Sevies , Tata McGraw-Hill.

3. J.P. Hayes, "Computer Architecture & Organization", Tata McGraw Hill

4. Digital Computer Fundamentals By Thomas C. Batree (McGraw Hill)

5. Microprocessor Architecture, Programming, and Application With the 8085 By Ramesh Gaonkar (PENRAM)

6. Fundamentals of Microprocessor and Microcomputes By B.Ram (Danpat Rai Publications)

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Paper Code: PGDCA-102

Paper Name : Programming with C++

Scheme of Examination

Maximum Marks: 50   Duration: 3 Hours

Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively.

Unit I

Object Oriented System**:** Difference Between Procedural and Object Oriented Languages, Object Oriented Paradigm, Inheritance, Polymorphism, Abstraction, Encapsulation, Benefits and Application of Oops. Introduction to C++: Character Set, Token, Constants, Variables and Data Types, Enumeration Types, Operators, Expressions, Operator Precedence and Associatively, Input, Output, Conditional Statements, Scope of Variables, Type Conversion.

Unit II

Iteration, Break, Continue, goto; Pointers**:** Introduction, implementation advantage and disadvantage**.** Functions **-** Standard and User-Defined Function, Recursive Function, Passing By Value And Reference, Function Overloading.

Unit III

Array**:** introduction, advantage, One, Two and Multidimensional, String Processing. Class: Introduction to Class and Object, Declaring Members and Methods in a class, declaring objects.

Unit IV

Functions and objects, Inline Function, Friend Functions and Its Usage, Abstract Class, Function Overriding. Constructor and Destructor**-** Needs and Its Usage, Types of Constructors, Destructor, Static Data Members and Methods. Inheritance - Need of Inheritance, Types of Inheritance and its implementation.

Unit V

Operator Overloading: Need and Rules of Operator Overloading, Overloading Through Member Function and Friend Function. Compile Time and Run Time Polymorphism- Virtual Function and virtual class.

Suggested Readings

1. Object Oriented Programming With C++ By E. Balagurusamy (Tata Mcgraw Hill)
2. C++ The Complete Reference By Herbert Sehildt (Tata Mcgraw Hill)
3. Object Oriented Programming With C++ By Schaum Series (Tata Mcgraw Hill)

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Paper Code: PGDCA-103

Paper Name : Database Management

Scheme of Examination

Maximum Marks: 50   Duration: 3 Hours

Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively.

Unit I

Introduction: Charecteristics of database approach, Advantages, Database system architecture, Overview of different types of Data Models and data independence, Schemas and instances, Databse languges and interfaces; E-R Model : Entities, Attributes,keys, Relationships, Roles, Dependencies, E-R Diagram.

Unit II

Introduction to Relational model, Constraints: Domain ,Key, Entity integrity, Referential integrity; Keys: Primary, Super, Candidate, Foreign; Relational algebra: select, project, union, intersection, minus, cross product, different types of join , division operations; aggregate functions and grouping.

Unit III

SQL: Data Types, statements: select, insert, update,delete, create, alter, drop; views, SQL algebraic operations, nested queries; Stored procedures: Advantages, Variables, creating and calling procedures, if and case statements, loops, Cursors, Functions, Triggers.

Unit IV

Normalization: Definition, Functional dependencies and inference rules, 1NF, 2NF, 3NF and BCNF; Transactions processing: Definition , desirable properties of transactions, serial and non-serial schedules ,concept of serialazability , conflict-serializable schedules.

Unit V

Concurrency Control: Two-phase locking techniques, dealing with Deadlock and starvation, deadlock prevention protocols, basic timestamp ordering algorithm; Overview of database recovery techniques;concept of datawarehousing.

Suggested Readings

1. Fundamentals of Database Systems,Ramez A. Elmasri, Shamkant Navathe,5th Ed(Pearson)

2. Database System Concepts By Korth, Silberschatz, Sudarshan (Mcgraw Hill)

3. An Introduction to Database Systems By Bipin C. Desai (Galgotia Publication.)

4. SQL, PL/SQL Programming By Ivan Bayross (BPB)

5. Commercial Application Development Using Oracle Developer 2000 By Ivan Bayross (BPB)

6. http://www.mysqltutorial.org/mysql-stored-procedure-tutorial.aspx

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Paper Code: PGDCA-104

Paper Name : Operating System

Scheme of Examination

Maximum Marks: 50   Duration: 3 Hours

Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively.

Unit I

Introduction to Operating System, layered Structure, Functions, Types; Process: Concept, Process States, PCB; Threads, System calls; Process Scheduling: types of schedulers, context switch.

Unit II

CPU Scheduling, Pre-Emptive Scheduling, Scheduling Criteria- CPU Utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling Algorithms- FCFS, SJF, Priority Scheduling, Round Robin Scheduling, MLQ Scheduling, MLQ With Feedback.

Unit III

Synchronization: Critical Section Problem, Requirements for a solution to the critical section problem; Semaphores,simple solution to Readers-Writers Problem. Deadlock: Characterization, Prevention, Avoidance, Banker's Algorithm, Recovery from Deadlock.

Unit IV

Memory Management: Physical and virtual address space, Paging, Overview of Segmentation;Virtual Memory Management: Concept,Page Replacement techniques- FIFO, LRU, Optimal. Linux: features of Linux, steps of Installation, Shell and kernel, Directory structure.

Unit V

Linux: Users and groups,file permissions, commands- ls, cat, cd, pwd, chmod, mkdir, rm, rmdir, mv, cp, man, apt, cal, uname, history etc. ; Installing packages; Shell scripts: writing and executing a shell script,shell variables, read and expr, decision making (if else), for and while loops.

Suggested Readings

1. Operating System Principals By Abraham Silberschatz, Peter Baer Galvin (John Wiley And Sons Inc.)

2. Operating System Concepts And Design By Milan Milen Kovic (Tata Mcgraw Hill)

3. Modern Operating System Andrew S. Tanenbaum, Herbert Bos
4. Linux in easy steps, Mike McGrath, in easy steps limited
5. Unix concepts and apllications , TMH, Sumitabha Das

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Paper Code: PGDCA-105

Paper Name : Computer Networks

Scheme of Examination

Maximum Marks: 50   Duration: 3 Hours

Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively.

Unit - I

Data Communication and Networking: Overview, Network Types, LAN Technologies, Topologies, Models- OSI Model, TCP/IP Stack, Security

Unit - II

Physical Layer: Introduction, Impairments, Performance, Digital Transmission, modes, digital to digital, analog to digital, Analog Transmission, digital to analog, analog to analog, Transmission media, Wireless Transmission, **Switching techniques:** Circuit Switching, Packet switching, Message switching.

Unit - III

Data Link Layer: Introduction, Data Link Control: Line Discipline- Enq/Ack, Poll/Select, **Flow Control** : Stop And Wait, Sliding Window, **Error Control :** ARQ, Stop and Wait ARQ, Sliding Window ARQ.

Unit - IV

Network Layer: Introduction, Network Addressing, Routing, Internetworking, Tunneling, Packet Fragmentation, Network Layer Protocols, ARP, ICMP, IPv4, IPv6

Unit V

Transport Layer: Introduction, Function, End to end communication, Transmission Control Protocol, User Datagram Protocol

Application Layer: Introduction, Client-Server Model, Application Protocols, Network Services

Suggested Readings

1. Data Communication and Networking By Forozan (Tata McGraw Hill)
2. Data Communication And Computer Networks By Dr. Madhulika Jain, Satish Jain (BPB)
3. William Stallings, "Data and Computer Communications", Pearson Education, 2008.
4. Rajneesh Agrawal and Bharat Bhushan Tiwari, "Data Communication and Computer Networks", Vikas Publishing house Ltd. , 2005.
5. A. S. Tanenbaum, "Computer Networks", Fourth Edition, Pearson Education.

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Paper Code: PGDCA-106

Paper Name : Project

Scheme of Examination

Maximum Marks: 50   Duration: 3 Hours

Minimum Passing Marks: 13

Marks distribution for Project of 100 marks is as under-

i) Project Dissertation and Presentation	75 marks
ii) External Viva Voce	25 marks

Practical Training and Project Work:

1. Project Work may be done individually or in groups in case of bigger projects(maximum two). However if project is done in group each student must be given a responsibility for a distinct module and care should be taken to monitor the individual student.

2. Project Work can be carried out in the college or outside with prior permission of college.

3. The Student must submit a synopsis of the project report to the college for approval. The Project Guide can accept the project or suggest modification for resubmission. Only on acceptance of draft project report the student should make the final copies.

4. **Project report should be hand written**

Submission Copy:

The Student should submit Spiral bound copy of the project report.

Format of the Project:

(a) **Paper:**
    The Report shall be typed on White Paper of A4 size.

(b) **Final Submission:**
    The Report to be submitted must be original.

(c) **Typing:**
    Font:- Times New Roman
    Heading:- 16 pt., Bold
    Subheading:- 14 pt, Bold
    Content:- 12 pt.
    Line Spacing:- 1.5 line.
    Typing Side :-One Side
    Font Color:- Black.

(d) **Margins:**
    The typing must be done in the following margin:
    Left : 0.75"
    Right: 0.75"
    Top: 1"

Bottom: 1"
Left Gutter: 0.5"

(e) Binding:
The report shall be Spiral Bound.

(f) Title Cover:
The Title cover should contain the following details:
Top: Project Title in block capitals of 16pt.
Centre: Name of project developer's and Guide name.
Bottom: Name of the university, Year of submission all in block capitals of 14pt letters on separate lines with proper spacing and centering.

(g) **Blank sheets:**
At the beginning and end of the report, two white blank papers should be provided, one for the Purpose of Binding and other to be left blank.

(h) Content:

    I). Acknowledgement

    II). Institute/College/Organization certificate where the project is being developed.

    III). Table of contents

    IV). A brief overview of project

    V). Profiles of problem assigned

    VI). Study of Existing System

    VII). System Requirement

    VIII). Project plan

- o   Team Structure
- o   Development Schedule
- o   Programming language and Development Tools

    IX). Requirement Specification

    X). Design

- o   Detailed DFD's and Structure Diagram
- o   Data structure, Database and File Specification

    XI). Project Legacy

- o   Current Status of project
- o   Remaining Areas of concern
- o   Technical and Managerial Lessons Learnt
- o   Future Recommendations

    XII). Nomenclature and Abbreviations.

    XIII). Bibliography

    XIV). Source Code.