

B.C.A. PART-III EXAM,

Paper 311 : Computer Graphics and Image Processing

Introduction to Computer Graphics : Definition, Application areas of Computer graphics, Graphical user interface, Cathod ray tubes, Random scan displays, Raster scan displays (with introduction to flickering, interlacing, American standard video etc), Color CRT monitors., Flat panel displays (Plasma Panels, Liquid crystal displays, Electroluminescent displays), Graphics software (GKS, PHIGS), Color Models (RGB, CMYK, HSV, Lookup tables etc.)

Raster Graphics Algorithms : Line drawing algorithms (DDA, Bresenham's algo), Circle and Ellipse drawing algorithms, Filling (Scan-converting Polygon filling \, Inside outside tests boundary fill and area fill algo).

Transformations and Projections : 2-D transformations (Rotation, Reflection, shearing, scaling), Homogeneous coordinate representation, Translation, 3-D transformations, Projection classification, Parallel projections, Perspective projections (One point, Two point).

Two dimensional Clipping and visible surface detection methods: Viewing pipeline, window and viewport, Sutherland Cohen sub division algorithm. Cyrus-beck algorithm. classification of visible surface detection algorithm. Back face algo, Depth sorting method. Area subdivision method etc.

Introduction to Digital Image Processing : Definition and application areas Digital Image Processing, difference between computer graphics and Image processing. The storage and capture of digital images, File formas, Basic digital Image processing techniques like antialiasing, Convolutions, Thresholding etc, Image enhancement.

References:

1. Hearn & Baker: Computer Graphics (2nd Ed.). Prentice Hall India.
2. Krihsnamurthy N: Introduction to computer Graphics, Tata McGraw Hill Edition.
3. Zhigang X. & Plastock R.A. : Theory and problems of Computer Graphics (Schaum's Outline), Tata McGraw Hill.

4. Gonzalez & Gonzalez, Digital Image Processing, Pearson Education.
5. Jain V.K., Fundamentals of Digital Image processing, Pearson Education.

Paper 312 : Software Engineering

Software Characteristics, Components, Applications, Software process Models : Waterfall, spiral, Prototyping, Fourth Generation Techniques, Concepts of Project Management, Role of Metrics & Measurements.

S/W Project planning Objectives, Decomposition techniques : S/W Sizing, Problem-based estimation, Process based estimation, Cost Estimation Models : COCOMO Model.

S/W Design : Objectives, Principles, Concepts, Design methodologies Data design, Architectural design, procedural design, Object oriented concepts

Testing fundamentals : Objectives, principles, testability, Test cases: White box & Black box testing, Testing strategies: verification & validation, unit test, integration testing, validation testing, system testing.

References:

1. Roger. S. Pressman, "Software Engineering—A Practitioner's Approach", Third Edition, McGraw Hill
2. R.D. Fairley, "Software Engineering Concepts", McGraw-Hill
3. Jajota, "An Integrated Approach to Software Engineering", Narosa Publishing House.

Paper 313 : Simulation and Modeling

Definition of System : Types of system-continuous and discrete Modeling process and definition of a model; Computer work load and preparation of its models; Verification and validation modeling procedures; comparing model data with real system.

Simulation Process : Use of simulation discrete and continuous simulation procedures; simulation of a time sharing computer system.

Simulation languages: A brief introduction to important discrete and continuous simulation language; Algorithm development and pseudo code writing for simulation problems.

Use of database and A.I. techniques in the area of modeling and simulation.

References:

1. Payer, T.A.: Introduction to simulation, Mc Graw Hill, 1982
2. Spriet, W.A.: Computer Aided Modeling and Simulation-Academic press, 1982
3. Barnes, B: Modeling and performance Measurement of Computer systems.

Paper 314 : Advanced Computer Architecture

Parallel Computer Models: The state of computing, multi-processors and multicomputers, multivector and SIMD computers, architectural development tracks.

Program and Network properties: conditions of parallelism, program partitioning and scheduling, program flow mechanisms.

System Interconnect Architectures: Network Properties and routing, Static interconnection network and dynamic interconnection networks.

Processors and memory Hierachy: Advanced processor technology-CISC, RISC, Superscalar, Vector VLIW and symbolic processors, memory hierarchy technology, Virtual memory technology.

Bus, Cache and Shared Memory.

Linar Pipeline Processors, Nonlinear Pipeline processors, Instruction pipeline Design Arithmetic pipeline Design, Multiprocessors System Interconnets Vector Processing Principles, Multivector Multiprocessors.

Text:

1. Kai Hwang "Advanced Computer Architecture", McGraw-Hill.

Reference:

1. J.P. Hayaes "Computer Architecture and Organization", McGraw-Hill.
2. Harvey G. Cragon, "Memory Systems and Pipelined Processors", Narosa Publication.
3. V. Rajaranam & C.S.R. Murthy, "Parallel Computers", PHI.
4. R.K. Ghose Rajan Moona & Phalguni Gupta, "Foundation of parallel processing", Narosa Publications.

5. Kai Hwang and Zu, "Scalable parallel Computers Architecture", McGraw-Hill.
6. Stalling W., "Computer Organization & Architecture", PHI.

Paper 315: Management Information Systems

Introduction to systems and Basic System Concepts, Types of Systems. The Systems Approach, Information Systems: Definition & Characteristics, Types of Information, Role of Information in Decision-Making, Sub-Systems of an Information system: EDP and MIS management levels, EDP/MIS/DSS.

An overview of Management Information System: Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS: Information requirements & Levels of Management, Simon's Model of decision- Making, Structured Vs Un-structured decisions, Formal Vs. Informal systems.

Developing Information Systems: Analysis & Design of Information Systems: Implementation & Evaluation, Pitfalls in MIS Development.

Functional MIS: A Study of Marketing, Personnel, Financial and production MIS.

References:

1. J. Kanter, "Management/ Information Systems". PHI.
2. Gordon B. Davis & M.H. Olson. "Management Information Systems: Conceptual Foundation, structure & Development".
3. Robert G. Murdick & Joel E. Ross & James R. Claggett, "Information Systems for Modern Management" PHI.
4. Lucas, "Analysis, Design & Implementation of Information System.

Paper 316: Network Security and Cryptology

Introduction: Goals and settings, The symmetric setting, The asymmetric setting. Other goals, Pseudorandom Number Generation, Authenticated key exchange, Coin flipping, What cryptography is about, Protocols, parties and adversaries, Cryptography and computer security, the rules of the game, Approaches to the study of cryptography, Phases in the cryptography's Development, Cryptanalysis-driven design, Shannon security for symmetric encryption, Compu-

tational complexity theory, Atomic primitives, The provable-security approach, theory for practice, What background do I need?, Historical notes, problems.

Block Ciphers: What is a block cipher? Data Encryption Standard (DES), Key recovery attacks on block ciphers, Iterated DES and DESX, Advanced encryption Standard (AES), Limitations of recovery key based security, Problems.

Pseudorandom Functions : Function families, Random functions and permutations, Pseudorandom Functions, Pseudorandom permutations, Modeling block ciphers, Example attacks, Security against key recovery, The birthday attack, The PRP/PRF switching lemma, Historical notes.

Symmetric Encryption: Some Symmetric Encryption schemes, Issues Iqn privacy, Indistinguishability under chosen-plaintext attack, Example chosen-plaintext attacks, IND-CPA implies PR-CPA, Security of CTR modes, Security of CBC with a random IV, Historical notes.

Hash Functions : The hash function SHA1, Collision resistant hash functions, Collision, attacks. One-way ness of collision resistant hash functions, Polynomial evaluation is an almost-universal hash, function, The CBC MAC function, Collision- resistance under hidden-key attack.

Message Authentication: The setting, Privacy does not imply authenticity, Syntax of message-authentication schemes, a definition of security for MACs, The PRF-as-a-MAC paradigm, The CBC MACs.

Number-Theoretic Primitives: Introduction to discrete algorithm related problems, The choice of group; The RSA system, Historical notes.

Asymmetric Encryption: Asymmetric encryption schemes, Notions of security, one encryption query or many? Hybrid encryption, El Gamal scheme and its variants.

Digital signatures: Digital signature schemes, A notion of security, RSA based signatures.

References:

1. Cryptographic & N/W security: Principles & Practices by Stall-
ing, Prentice Hall.
2. Network Security Essentials: Application & standards by Stall-
ing, Pearson Education Asia, 2003.

Paper 317 : E-Banking and Security Transactions

Introduction: Definition, Transaction websites components, E-
Banking support services, Wireless Banking.

E-Banking Risk: Transaction/Operation Risk, Credit Risk, Li-
quidity/Internet Risk, Price Risk, Legal Risk, Strategic Risk, Reputa-
tion Risk.

Risk Management of E-Banking Activities: Board of Man-
agement oversight, Managing outsourcing relationship, Information
security Program, Administrative control, Legal and compliance Is-
sue.

Laws regulation and guidelines: Electronic money, Regulating
e-transactions. Role of RBI and Legal issues, Transnational transac-
tions of E-Cash, Credit Card and Internet, Laws relating to Internet
credit cards. Secure Electronic Transactions.

E-security: Introduction to New Challenges and new Threats,
Security. Legal consideration.

References :

1. Mark O'Neill "Web Services Security".
2. Nixon Brian "Teach yourself E-Banking".
3. E-Banking: Global Perspective by Vivek Gupta, Edition June
2000, ICFAI University Press.

Paper 318 : Internet Application Development

HTML Fundamentals : Introduction to HTML, Creating HTML
Pages, Incorporating Horizontal Rules and Graphical Elements, Hyper-
links, Creating HTML Tables, Creating HTML Forms, HTML and
Image Techniques, HTML and Page Accessibility. Introduction to
Java: History, Java Features, JVM, Java vs C++, Java and WWW,
Java and HTML, JDK tools.

Language Features : Data types - Primitives, Operators and
Expressions, Type casting and conversion, Control flow.

Classes and Objects : Object References, static members, Constructor call orders, Issues with super, Wrapper classes, Compatible Object Referencing, Memory Management, Garbage collection.

Packages and Interfaces: Access specifies, Packages and subsystems, Import dependency, Interfaces, Abstractness in Java, Basics on of Interfaces, Use of Interfaces, Examples on interfaces. Other modifiers final-The three manifestations transient, static, volatile.

Exception handling in Java: Exception raising & handling, Exception classes, Throwing exceptions, Try - catch - finally, Exception Propagation, Runtime Exceptions, User defined Exceptions, Examples.

I/O in Java: Concept of Streams, Byte steams and Character streams, Random Access File, File and File Descriptor, Object Serialization and Persistence.

AWT based effective GUI in Java: Detailed overview of AWT classes, Graphics primitives and UI Components, Layout features, Standalone GUI applications, Layout Managers, Implementation of event driven mechanism, Delegation of even model, Listeners and Adapters, Inner classes.

Applets: Introduction to Applet coding, Applet life cycle, Graphics facility, Color and Font, Passing parameters to applets. Aplet context, Inter Applet Communication.

Threading in Java: Fundamentals of Multi-Threading, Java coding with Thread classes, Thread Management in Java, Implicit wait, Using Runnable interface, Thread Synchronization, Inter thread communication.

Overview of Networking in Java: URL class and its usage through connection, Sockets based connectivity, TCP/IP Sockets and server sockets, Datagram Sockets.

Java Database connectivity: JDBC Architecture, JDBC API 2.0.

Java Script Fundamentals: Introduction to JavaScript. Working with Variables and Data Functions, Methods and Events, Controlling Program Flow. The Java Script Object Model, Java Script Lan-

guage Objects, Developing Interactive Forms, Cookies and Java Script Security, Controlling Frames in Java Script, Client-side Java Script, Custom JavaScript Objects.

References :

1. Mastering HTML 4.0 by Deborah S. Ray and Eric J. Ray From BPB
2. Core Java Volume I by Sun series.
3. Mastering Java Script, BPB publication.

Paper 319 : E-Commerce

Introduction to Electronic Commerce : Definition of Electronic Commerce, The scope of Electronic Commerce.

Business Strategy in an Electronic Age : The value chain, Competitive advantage, Business strategy.

Business to Business Electronic Commerce: Inter-organisational transactions, Electronic markets, Electronic data interchange (EDI), EDI: the nuts and bolts, EDI and Business Inter organisational E-Commerce.

Designing (Technical, Detailed, High Level): Introduction to Technical Design and Construction. A Client Server Model of E-Commerce, Understanding Technical Design, Understanding Construction. Introduction to Detail Design: General Design Principles. Presentation Segment Design. Interaction Design. Using Interface Prototypes in Design, Applying Detailed Design. Any example of Applying Detailed Design: Introduction to High-Level Design. Understanding High-level Design, Performing High-level Design, High-Level design of Business Transactions, Applying High-Level design, Any Example of Applying High-Level Design, Challenges and Opportunities in Applying High-Level Design.

Testing & Implementation: Introduction to Testing, Understanding Testing. Applying Testing. Challenges and Opportunities in Applying Verification and Validation.

Implementation : Understanding Implementation. Applying Implementation Planning. An Example of Applying Implementation Planning. Challenges and Opportunities in Applying Implementation Planning.

References:

1. Developing E-Commerce Systems by Jim A. Carter, PHI.
2. E-Commerce new vistas for business by T.N. Chandra, R.K. Suri, Sanjiv Verma, Dhanpat Rai & Co.

Paper 321 : Oracle/Autocad 2000 (Laboratory)

Autocad : Installation of Autocad, Introduction of Autocad, Drawing commands, editing commands, Display commands, 3D commands, Drawing aids, Information commands, Blocks and Layers, Layout of Buildings etc.

OR

Oracle : Introduction to oracle, Components of Oracle, Applications on various DDL, DML commands, Queries, Multiple queries, Views, Reports, Triggers.

**Paper 322 : Web Site Development &
Web Client Programming (Laboratory)**

Website Development using web authoring tools: Front Page, Visual Interdev. Flash and their relative comparison.

Detail studies of Server programming: ASP, JSP, PHP and relative comparison.

**Paper 323 : Computer Architecture and
Networking Lab. (Laboratory)**

Windows 2000 advanced server/Linux - Shell programming. Creation of parent-child processes. Inter-Process Communication Programming.



UNIVERSITY OF RAJASTHAN JAIPUR

RULES FOR THE AWARD OF GRACE MARKS

- A. UNDER GRADUATE/POST GRADUATE (MAIN/SUPPLEMENTARY) EXAMINATIONS UNDER THE FACULTIES OF ARTS, FINE ARTS, SCIENCE, COMMERCE, SOCIAL SCIENCE, EDUCATION, MANAGEMENT, HOMOEOPATHY, LAW, AYURVEDA AND ENGINEERING & TECHNOLOGY.**

Grace marks to the extent of 1% of the aggregate marks prescribed for an examination will be awarded to a candidate failing in not more than 25% of the total number of theory papers, practicals, sessionals, dissertation, viva-voce and the aggregate, as the case may be, in which minimum pass marks have been prescribed; provided the candidate passes the examination by the award of such Grace Marks. For the purpose of determining the number of 25% of the papers, only such theory papers, practicals, dissertation, viva-voce etc. would be considered, of which, the examination is conducted by the University.

N. B. : If 1% of the aggregate marks or 25% of the papers works out in fraction, the same will be raised to the next whole number. For example, if the aggregate marks prescribed for the examination are 450, grace marks to the extent of 5 will be awarded to the candidate, similarly, if 25% of the total papers is 3.2, the same will be raised to 4 papers in which grace marks can be given.

B. DIPLOMA IN PHARMACY, BACHELOR OF PHARMACY, B.Sc. (NURSING) AND B.D.S. EXAMINATIONS

1. A Student who obtains the required minimum pass marks in the total aggregate but fails to obtain the minimum pass marks in (i) two subjects, (ii) in one subject and in one practical or (iii) in two practicals, as the case may be, will be given grace marks according to the following scale, provided the candidate passes the examination by the award of such grace marks.

For 1 to 6 marks above

the min. aggregate : 2 grace marks

For 7 to 12 marks above

the min. aggregate : 3 grace marks

For 14 to 18 marks above

the min. aggregate : 4 grace marks

For 19 and above the min. aggregate : 5 grace marks

(i) The theoretical and practical tests (wherever held) in a subject will count as 2 subjects.

(ii) In case it is necessary to secure minimum pass marks in one part of a subject the above rule will be applicable as follows.

“If a candidate fails in the compulsory part of the subject as well as in the whole subject, he will be deemed to have passed in the subject if the greater of the two deficiencies or where the two deficiencies are equal, one of them is covered by the grace marks to which he is entitled under the rules.

2. No grace marks would be awarded to a candidate who appears in part/supplementary examination.

C. M.B.B.S AND B.A.S.L.P. (BACHELOR OF AUDIOLOGY, SPEECH AND LANGUAGE PATHOLOGY) EXAMINATIONS

1. The grace marks upto a maximum of 5 marks will be awarded to a student who has failed only in one subject (Theory and/or practical) but has passed in all other subject.
2. No grace marks would be awarded to a candidate who appears in part/supplementary examination.

General

1. A candidate who passes in a paper/practical or the aggregate by the award of grace marks will be deemed to have obtained the necessary minimum for a pass in that paper/practical or in the aggregate and shown in the marks sheet to have passed by grace. Grace marks will not be added to the marks obtained by a candidate from the examiners nor will the marks obtained by the candidate be subject to any deduction due to award of grace marks in any other paper/practical or aggregate.
2. If a candidate passes the examination but misses First or Second Division by one mark, his aggregate will be raised by one marks so as to entile him for the first or second division, as the case may be. This one mark will be added to the paper in which he gets the least marks and also in the aggregate by showing +1 in the tabulation register below the marks actually obtained by the candidate. The marks

entered in the marks-sheet will be inclusive of one grace mark and it will not be shown separately.

3. Non appearance of a candidate in any paper will make him ineligible for grace marks. The place of a passed candidate in the examination list will, however, be determined by the aggregate marks he secures from the examiners, and he will not, by the award of grace marks, become entitled to a higher division.
4. Distinction won in any subject at the examination is not to be forfeited on the score that a candidate has secured grace marks to pass the examination.

Note : The grace marks will be awarded only if the candidate appears in all the registered papers prescribed for the examination.
