

Nepal Airlines Corporation
Syllabus of Computer Software Engineer (Grade– VII)
Open Competition

A. Stages and Procedure of Examination System

| चरण | विषय | अंकभार | परीक्षा प्रणाली | प्रश्न संख्या X अङ्क | समय |
|------------------|---------------------------|--------------------------------|--|--------------------------------|---------|
| प्रथम चरण ८०% | लेखन शिप सेवा सम्बन्धी | पुर्णांक १०० उत्तिर्णांक ४० | Multiple Choice Questions (वस्तुगत) विषयगत प्रश्नोत्तर | ७० X १ = ७० ०६ X ५ = ३० | ३ घण्टा |
| द्वितीय २०% | अन्तरवार्ता | २० | मौखिक | | |

B. Content Material

1. Structured and Object oriented Programming

Data types, ADT

Operators, variables and assignments, control structures Procedure/Function

Class definitions, encapsulation, inheritance, object composition, polymorphism

Greedy methods, priority queue search, Exhaustive search, divide and conquer, dynamic programming, recursion

Hashing

Graphs and digraphs sorting

(5 objective questions each of 1 mark and 1 subjective question of 5 marks)

2. Computer Architecture and organization

RISC/CISC architecture

Instruction format, arithmetic and logical instruction addressing modes

Hardwired and micro-programmed control

I/O programming, memory mapped I/O, basic interrupt system, DMA

(5 objective questions each of 1 mark)

3. Software Engineering & Software Project Management

Software process

Software project management

Software requirements

Software design

Software quality, Software reliability and quality assurance

Verification and Validation techniques

Critical System Validation

Implementation and testing

Embedded Software

Project management

Project planning

Quality management

Configuration management

Process improvement

(10 objective questions each of 1 mark and 2 subjective question of 5 marks)

4. Database management system

Relation model, ER model, SQL, functional dependency and relational database design, file structure

Concurrent execution of the user programs, transactions, concurrent control techniques

Crash recovery: types of failure, recovery techniques

Query processing and optimization

Hash based indexing, tree based indexing

Distributed database systems and object oriented database system

Security management system

(10 objective questions each of 1 mark and 1 subjective question of 5 marks)

5. Operating system

Symmetric multiprocessing, micro-kernels, concurrency, mutual exclusion and synchronization, deadlock

Scheduling

Deadlocks

Memory management

File system

Distributed message passing, RPC, client/server computing, clusters

(5 objective questions each of 1 mark)

6. Management Information System

6.1. Organization and Information System

Changing Environment and its impact on Business- The IT/IS and its influence-The Organization: Structure, Managers and activities- Data, information and its attributes- The level of people and their information needs- Types of Decision and information- Information System, categorization of information on the basis of nature and characteristics.

6.2. Kinds of Information Systems

Transaction Processing System (TPS)- Office Automation System (OAS)-Management Information System (MIS) – Decision Support System (DSS) and Group Decision Support System (GDSS) – Expert System (ES) – Executive Support System (EIS or ESS).

6.3. Enterprise System

Enterprise Resources Planning (EPR): Features, Selection criteria, merits, issues

and challenges in implementation- Supply Chain Management (SCM): Customer Relationship Management (CRM): Phases, Knowledge Management. Enterprise service oriented architecture (SOA) cloud computing for Enterprise architecture Enterprise SOA data center.

(5 objective questions each of 1 mark and 1 subjective question of 5 marks)

7. Information Security

Security Policies
Cryptography
Access control & Information flow
Auditing
Intrusion Detection System

(5 objective questions each of 1 mark)

8. Artificial Intelligence

Search
Natural Language Processing Game
Planning
Learning
Automated Reasoning Planning
Vision and Robotics

(5 objective questions each of 1 mark)

9. Theory of Computation

BNF, Languages, Grammars
DFA and NDFA, regular expressions, regular grammars Closure,
homomorphism
pigeonhole principle, pumping lemma
CFGs, Parsing and ambiguity, Pushdown automata, NPDAs & CFGs Pumping
lemma
Turing Machines
Recursively enumerable languages unrestricted grammars
The Chomsky hierarchy, Undecidable problems, Church's Thesis Complexity
Theory, P and NP

(5 objective questions each of 1 mark)

10. Compiler Design

The Structure of a computer Lexical
Analyzer
Top down Parsing/ Bottom up Parsing Syntax
Directed Translation
Types and Type Checking
Run-Time Storage Administration Intermediate
Code Generation
Data-Flow Analysis and Code Optimizations
Architecture and recent development on compilers
(5 objective questions each of 1 mark and 1 subjective question of 5 marks)

11. Computer Graphics

Graphics Concepts
Input devices and techniques
Basic raster graphics algorithms' and Bit-Plane

Clyion

Hierarchical modeling

Projections

Hidden surface removal Shading and rendering

(5 objective questions each of 1 mark)

12. IT in Nepal

History of IT Development IT Policy of

2010 A.D

Electronic Transaction Act 2063 B.S Copy Write

Act, 2022 B.S

Uses of Computers and Software Development Nepali

Unicode, Nepali Fonts

Licensing

(5 objective questions each of 1 mark)
