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नेपाल सरकार

शिक्षक सेवा आयोग

माध्यमिक तह (कक्षा ९-१२) को शिक्षक अध्यापन अनुमतिपत्रको लिखित परीक्षा पाठ्यक्रम, २०७५

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पहिलो पत्र : **COMPUTER ENGINEERING**   65 Marks

Introduction

This course is designed in such a way it tests candidate's knowledge related to computer engineering. This course is specially designed to understand basic knowledge of computer and the terminologies associated with computer engineering. It is focused on computer fundamentals, computer programming, web development and database and network and internet.

Objectives

- To acquire basic knowledge and skills related to computer engineering
- To develop knowledge of computer system and its hardware and software
- To develop the knowledge of how computer language works and how they are used in the home, school , workplace and community
- To develop the good command in HTML ,CSS , JAVASCRIPT and Database
- To develop the knowledge of different types of networks, its types and its applications

Part : I   **40 marks**

1. Computer Fundamentals

    1.1 Computer Basic

        1.1.1   Characteristics of computer

        1.1.2   Applications of computer

        1.1.3   History and generation of computers

        1.1.4   Types of computers

    1.2 Components of computer system

        1.2.1   Input

        1.2.2   Output

        1.2.3   Memory

        1.2.4   Process

    1.3 Software and its types

        1.3.1   System software and its types

        1.3.2   Application software and its types

    1.4 Computer security

        1.4.1   Virus and Antivirus

        1.4.2   Computer handling

2. Network and internet

   2.1   Types of networks

   2.2   Network topologies

   2.3   Protocols

   2.4   IP addresses and its types and classes

   2.5   OSI Model

   2.6   Network architecture

   2.7   Networking devices

   2.8 Internet and Email and its terms

   2.9 Network security

3. Programming

3.1 Structured oriented programming using C

- 3.1.1 Introduction and history
- 3.1.2 Compiling process
- 3.1.3 Fundamentals of C
- 3.1.4 Operators and expressions
- 3.1.5 I/O functions
- 3.1.6 Control structures
- 3.1.7 Array and string
- 3.1.8 Functions
- 3.1.9 Structure
- 3.1.10 Pointers

3.2 Object Oriented Programming using C++

- 3.2.1 Introduction to OOP
- 3.2.2 OOP features and characteristics
- 3.2.3 C++ basic input and output
- 3.2.4 Objects and classes in C++
- 3.2.5 Inheritance
- 3.2.6 Polymorphism
- 3.2.7 Encapsulation
- 3.2.8 Data Abstraction
- 3.2.9 Structures using C++

3.3. Computer Systems

- 3.3.1 Concept of Computer Architecture
- 3.3.2 Concept of Computer Organization
- 3.3.3 Microprocessor- Concepts, Components of Processor, Functions
- 3.3.4 Concept of System Buses: Data Bus, Address Bus, Control Bus
- 3.3.5 Storage Device- Definition, Use, Types: Hard Disk, Floppy Disk, Magnetic Tape, Flash Memory, Optical Disk (CD, VCD, DVD) External storage device
- 3.3.6 Interfaces- Parallel Port, Serial Port, USB ports
- 3.3.7 Identification of PC Accessories and Peripherals
- 3.3.8 Specification of PC
- 3.3.9 Computer Security

3.4. Operating System

- 3.4.1 Introduction to operating system
- 3.4.2 Role of Operating System
- 3.4.3 Functions of an Operating System
- 3.4.4 Types of Operating System:

4. Web development and database
   4.1 HTML,
      4.1.1   Understanding browsers
      4.1.2   HTML page structure
      4.1.3   Defining web layout
      4.1.4   Html tags and attributes
      4.1.5   HTML 5 introduction
      4.1.6   HTML 5 elements and attributes

   4.2 JavaScript
      4.2.1   Types of script
      4.2.2   JavaScript variables and functions
      4.2.3   JavaScript Alert
      4.2.4   JavaScript arrays and loops
      4.2.5   JavaScript operators

   4.3 CSS
      4.3.1   Introduction to cascading style sheets
      4.3.2   Types of style sheets
      4.3.3   Class selector, ID selector
      4.3.4   Working with CSS
      4.3.5   Css3 modules and features

   4.4 Database Management system
      4.4.1   Introduction to database system architecture
      4.4.2   ER model
      4.4.3   Introduction to relational database SQL
      4.4.4   SQL queries and commands
      4.4.5   Normalization of Database
      4.4.6   Concurrency control and recovery
      4.4.7   Centralized and distributed databases
      4.4.8   Data security, backup and restore

Part : II   **25 marks**

5. Curriculum related knowledge
      5.1 Space of the relevant object in secondary school curriculum and organization
      5.2 Breadth/depth of content
      5.3 Knowledge of the competencies and learning outcomes
      5.4 Resource materials

6. Classroom teaching skills
      6.1 Visual and demonstration method
      6.2 Effective presentation skills / Exposition
      6.3 Problem based learning strategies
      6.4 Small group discussion / whole class discussion
      6.5 Observation as an instructional strategy

7. Use of projects and fieldwork in instructions
      7.1 Designing projects (considerations)
      7.2 Implementing and communicating
      7.3 Reporting/ exhibition /presentation

8. Assessment in teaching
8.1 Knowledge of the assessment plan and specification grid in the school curriculum
8.2 Developing test and appropriate tools for student assessment
8.3 Authentic assessment to measure performance

9. Usage of ICT
9.1 ICT as CPD (Information retrieve/search/manage, knowledge of ICT components
9.2 ICT as content enhancement(use of various ICT tools to explore different topics of engineering and terminologies
9.3 ICT as delivery tool (Mobile, Multimedia software, Online materials, games in classroom for specific contents)

Marks distribution and Grid

Units	Objective Question			Subjective Question			Total Q	Total Marks
	No.of Q.	Marks	Total	No.of Q.	Marks	Total		
1	8	1	8	-	-	-	1	1
2	8	1	8	-	-	-	1	1
3	12	1	12	-	-	-	1	1
4	12	1	12	-	-	-	1	1
5	-	-	-	5	1	5	1	5
6	-	-	-	5	1	5	1	5
7	-	-	-	5	1	5	1	5
8	-	-	-	5	1	5	1	5
9	-	-	-	5	1	5	1	5
Total	40	1	40	5	5	25	45	65

द्रष्टव्य :
१. प्रश्न पत्र तयार गर्दा संज्ञानात्मक तहका सबैजसो क्षेत्र समेटिने छन् ।
२. विषयगत प्रश्नहरूमार्फत सिर्जनशीलता र शिक्षणसँग सम्बन्धित व्यावहारिक पक्षहरू मापन गर्ने उद्देश्य राखिने छ ।
३. कण्ठस्थ गरी दिइएका जवाफभन्दा शिक्षण सिकाइसँग सम्बन्धित व्यावहारिक पक्षहरूको विश्लेषण ⁄ विवेचना तथा समस्याको समाधान गर्दै दिइएका मौलिक तथा सिर्जनात्मक उत्तरलाई प्रोत्साहित गरिने छ ।
४. खण्ड (ख) अन्तर्गतका शिक्षणकलासँग सम्बन्धित प्रश्नहरू खण्ड (क) मा दिइएका विषयहरुको व्यबहारिक पक्षसँग जोडेर तयार गरिने छन् ।
५. लामो उत्तर आउने प्रश्नहरु शिक्षणमा सूचना प्रविधिको प्रयोगलाई समेत ध्यान दिइने छ ।

Specification Grid

Multiple choice questions (MCQ)   **Full Marks: 40**

Each question carries 1 mark

unit	Scope		Total Questions
1	**Computer fundamentals**		
	i)	computer Basic	2
	ii)	components of computer system	2
	iii)	software and its types	2
	iv)	Computer security	2
		Total	**8**
2	**Network and internet**		8
		Total	**8**
3	**Programming**		
	i)	Structure oriented programming using C	6
	ii)	Object Oriented programming using C++	6
		Total	**12**
4	**Webpage development and database**		
	i)	HTML	3
	ii)	JavaScript	3
	iii)	Cascading Style Sheet	3
	iv)	Database Management System	3
		Total	**12**
	Total Questions		**40**