

CHAPTERWISE & TOPICWISE

QUESTION BANK

COMPUTER SCIENCE (PYTHON)

Previous years solved papers
2009-2017 (All sets of Delhi & Outside Delhi)

CBSE CLASS 12

Strictly Based on the Latest CBSE Syllabus Dated 4th April 2017 for Academic Year 2017-18



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2018

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PREFACE

CBSE always believes in Global Trends of Educational Transformation. The CBSE curriculum gets its lead from National Curriculum Framework – 2005 and Right to Free and Compulsory Education Act – 2009. The aim of CBSE Curriculum is not just to let learners obtain basic knowledge but to make them life-long learners. CBSE always updates and reviews the syllabus to make it more relevant with educational transformation and in last few years the chapters and topics which CBSE has added are very interesting and increase practical knowledge.

Oswaal Question Banks are designed to nurture individuality and thus enhance one's innate potentials which helps in increasing the self-study mode for students. This book strengthens knowledge and attitude related to subject. It is designed in such a way that students can set their own goals and can improve their problem solving and thinking skills.

The journey of this book is never ending as this book is reviewed every year and new questions, previous year's examination questions, new HOTS or any change in syllabus is updated time to time. Also regular review and readers' feedback increases the efficiency of this book gradually.

Moreover every Question Bank strictly follows the latest syllabus and pattern, and contains more than sufficient questions and brief description of chapters, which help students in practicing and completing the syllabus. Questions incorporated in this Question Bank encompass all the 'Typologies' mentioned by CBSE namely Remembering, Understanding, Application, High Order Thinking Skills and Evaluation. Solutions for these have been checked twice and efforts have been made to align them closely to the Marking Scheme. Practically, this book provides students everything they need to learn and excel.

At last we would like to thank our authors, editors, reviewers and specially students who regularly send us suggestions which helps in continuous improvement of this book and makes this book stand in the category of "One of the Best". Wish you all Happy Learning.

–Publisher



Elon Musk

Born: 28 June, 1971

Business Magnet, Investor, Engineer, Inventor

Elon Musk became a multimillionaire in his late 20s when he sold his start-up company, Zip2, to a division of Compaq Computers. He achieved more success by founding X.com in 1999, SpaceX in 2002 and Tesla Motors in 2003. Musk made headlines in May 2012 when SpaceX launched a rocket that would send the first commercial vehicle to the International Space Station. Musk has stated that the goals of his companies Solarcity, Tesla & SpaceX revolve around his vision to change the world and humanity. His goals include reducing global warming through sustainable energy production and consumption. He aims to set up a human colony on Mars and life multi-planetary.

At the age of 12, he earned \$500 by selling a computer game Blaster (a shooter similar to Space Invaders), which he had created himself.

He enrolled in the graduate school at Stanford University to pursue studies in the field of applied physics and materials science. However, after 2 days, he left the graduate school and together with his brother, Kimbal Musk, he created his first IT company Zip2.

Information in this section is sourced from various available sources. Though all efforts have been made to make sure it is trustworthy, Oswaal Books shall not be responsible for mistakes, if any.

Latest Syllabus for Academic Year 2017-18

Computer Science – Python

Duration : 3 Hours

Total Marks : 70

Unit No.	Unit Name	Marks
1.	OBJECT ORIENTED PROGRAMMING WITH PYTHON	24
2.	ADVANCED PROGRAMMING WITH PYTHON	20
3.	DATABASE MANAGEMENT SYSTEM AND SQL	8
4.	BOOLEAN ALGEBRA	8
5.	COMMUNICATION TECHNOLOGIES	10
TOTAL		70

UNIT 1 : OBJECT ORIENTED PROGRAMMING WITH PYTHON (50 Theory + 40 Practical) Periods

Review : Python covered in Class XI

Concept of Object Oriented Programming : Data Hiding, Data Encapsulation, Class and object, polymorphism, inheritance, advantages of Object Oriented Programming over earlier programming methodologies.

Classes : Defining classes (attributes, methods) creating instance objects, accessing attributes and methods, using built in class attributes (dict, doc, name, module, bases), constructor (`__init ()` , `__del ()` and `__str ()`) methods in a class, private attributes (limited support), importance of “self” (acts as a pointer to current calling object) operator overloading with methods.

Inheritance : Concept of base class and derived class : Single mutilevel and multiple inheritance-overriding methods, using `super ()` in derived class to invoke `__init ()` or overridden methods of parent class.

UNIT 2 : ADVANCE PROGRAMMING WITH PYTHON (42 Thoery + 36 Practical) Periods

Linear List Manipulation : Sequential allocation, traversal, insertion of an element in a sorted list, deletion of an element from the list, searching (linear, binary), sorting (insertion, selection, bubble).

Stacks (List implementation) : introduction to stack (LIFO operations), operations on stack (PUSH and POP) and its implementation in Python.

Converting expressions from infix to postfix notation and evaluation of postfix expression.

Queues (List implementation) : introduction to Queue (FIFO), operations on Queue (INSERT and DELETE) and its implementation in Python.

Data File

Need for data file, types of data file — text and binary, Opening and closing files – `open()`, `close()`, access modes (output, input, default), file object, `access_modes`, reading and writing a file `read ()`, `readline ()`, `readlines ()`, `write ()`, `writelines` file positions (`seek()`, `tell()`), renaming and deleting a file, `flush()`;

Implementation of basic file operations on text and binary file in Python: Creating/writing data into file, reading and displaying data from file, searching for particular data from a file, insertion and deletion of data from an already existing file, modification of data in file.

Error and Exceptions – `NameError`, `IndexError`, `TypeError`, `IO Error`, `ImportError`, `ValueError`, `EOFError`.

Generator function using `Yield`.

UNIT 3 : DATABASES AND SQL (20 Theory + 20 Practical) Periods

Data base Concepts : Introduction to data base concepts and its need.

Relational data model : Concept of domain, tuple, relation, key, primary key, alternate key, candidate key;

Relational algebra : Selection, Projection, Union and Cartesian product;

Structured Query Language :

General Concepts : Advantages of using SQL, Data Definition Language and Data Manipulation Language;

Data Types : NUMBER/DECIMAL, CHARACTER/VARCHAR/VARCHAR2, DATE;

SQL COMMANDS : CREATE TABLE, DROP TABLE, ALTER TABLE, UPDATE ...SET....., INSERT, DELETE; SELECT, DISTINCT, FROM, WHERE, IN, BETWEEN, GROUP BY, HAVING, ORDER BY;

SQL functions : SUM (), AVG (), COUNT (), MAX () AND MIN () ; Obtaining results (SELECT query) from 2 tables using equi-join, Cartesian product and Union.

Note : Implementation of the above mentioned commands could be done on any SQL supported software on one or two tables.

UNIT 4 : BOOLEAN ALGEBRA

(16 Theory + 0 Practical) Periods

Role of Logical Operations in Computing.

Binary - valued Quantities, Boolean Variable, Boolean Constant and Boolean Operators : AND, OR, NOT; Truth Tables; Closure, Property, Commutative Law, Associative Law, Identity Law, Inverse Law, Principle of Duality, Idempotent Law, Distributive Law, Absorption Law, Involution Law, DeMorgan's Law and their applications;

Obtaining Sum of Product (SOP) and Product of Sum (POS) from the Truth Table, Reducing Boolean Expression (SOP and POS) to its minimal form, Use of Karnaugh Map for minimization of Boolean expression (upto 4 variables);

Application of Boolean Logic : Digital electronic circuit design using basic Logic Gates (NOT, AND, OR, NAND, NOR)

Use of Boolean operators (NOT, AND, OR) in SQL SELECT statements.

Use of Boolean operators (AND, OR) in search engine queries.

UNIT 5 : COMMUNICATION TECHNOLOGIES

(16 Theory + 3 Practical) Periods

Evolution of Networking : ARPANET, Internet, Interspace Different ways of sending data across the network with reference to switching techniques (Circuit and Packet switching).

Data Communication terminologies : Concept of Channel, Bandwidth (Hz, KHz, MHz) and Data transfer rate (bps, kbps, Mbps, Gbps, Tbps).

Transmission media : Twisted pair cable, coaxial cable, optical fiber, infrared, radio link, microwave link and satellite link.

Network devices : Modem, RJ45 connector, Ethernet Card, Router, Switch, Gateway, wifi card.

Network Topologies and types : Bus, Star, Tree, PAN, LAN, WAN, MAN.

Network Protocol : TCP/IP, File Transfer Protocol (FTP), PPP, SMTP, POP3, Remote Login (Talent), and Internet Wireless/Mobile Communication protocol such as GSM, CDMA, GPRS, WLL.

Mobile Telecommunication Technologies : 1G, 2G, 3G and 4G Mobile processors

Electronic mail protocols such as SMTP, POP3

Protocols for Chat and Video Conferencing VOIP

Wireless technologies such as Wi-Fi and WiMax

Network Security Concepts :

Threats and prevention from Viruses, Worms, Trojan horse, Spams

Use of Cookies, Protection using Firewall, https;

India IT Act, Cyber Law, Cyber Crimes, IPR issues, hacking.

Introduction To Web Services : WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML); Hyper Text Transfer Protocol (HTTP); Domain Names; URL; Website, Web browser, Web Servers. Web Hosting, Web Scripting—Client side (VB Script, Java Script, PHP) and Server side (ASP, JSP, PHP), Web 2.0 (for social networking)

E-Commerce payment transactions using online banking, mobile banking and payment apps and services.

Class XII (Practicals) - Python

Duration : 3 Hours

Total Marks : 30

1. **Programming in Python** 10
One programming problem in Python to be developed and tested in Computer Lab during the examination. Marks are allotted on the basis of following :
Logic : 6 Marks
Documentation/Indentation : 2 Marks
Output presentation : 2 Marks
Note : The types of problems to be given will be application type developed using classes from the following topics
 - String
 - Lists/Tuples
 - Dictionary
 - File Operations
2. **SQL Commands** 05
Five Query questions based on a particular Table/Relation to be tested practically on Computer during the examination. The command along with the result must be written in the answer sheet.
3. **Project Work** 05
The project has to be developed in Python language with Object Oriented Technology.
(The project is required to be developed in group of 2-4 students)
 - Presentation on the computer
 - Project report (Listing, Sample, Outputs, Documentation)
 - Viva
4. **Practical File** 06
Must have minimum 20 programs from the following topics
 - Lists (general, stack, queue)
 - File Handling
 - Programs based on Object Oriented Concepts
 - 15 SQL commands along with the output based on any table/relation*** 1 mark is for innovating while developing programme.**
5. **Viva Voce** 04
Viva will be asked from syllabus covered in class XII and the project developed by student.

WRITING - NOTES

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**SOLVED
PAPER**

**C.B.S.E.
2017
Class–XII
Delhi & Outside Delhi**

**Computer
Science
(Python)**

Time : 3 Hours

Max. Marks : 70

General Instructions :

- (i) All questions are compulsory.
- (ii) Answer the questions after carefully reading the text.

Delhi Set

Code No. 90/1

**SECTION - B
(Only for Candidates, who opted for Python)**

1. (a) Which of the following can be used as valid variable identifier(s) in Python? 2
- (i) total
 - (ii) >selute
 - (iii) Que\$tion
 - (iv) global
- (b) Name the Python Library modules which need to be imported to invoice the following functions : 1
- (i) coil ()
 - (ii) randint ()
- (c) Rewrite the following Code in Python after removing all syntax error(s). Underline each correction done in the code. 2
- ```
TEXT " " GREAT
DAY " "
for T in range [0, 7];
 print TEXT (T)
print T + TEXT
```
- (d) Find and write the output of the following Python code : 2
- ```
STR = ("90", "10", "30", "40")
COUNT = 3
SUM = 0
for I in [1, 2, 5, 4];
    S = STR [COUNT]
    SUM = float (S) + I
    print SUM
    COUNT -= 1
```
- (e) Find and write the output of the following Python code : 3
- ```
class ITEM :
 def __init__(self, I = 101, N = "Pen", Q = 10) : #constructor
 self . Ino = I
 self . IName = N
 self . Qty = int (Q);
 def Buy (self, Q) :
 self . Qty = self . Qty + Q
 def Sell (self, Q) :
 self . Qty -= Q
 def ShowStock (self) :
 print self . Ino, ":", self . IName, "#", self .Qty
```

```

I1 = ITEM ()
I2 = ITEM (100, "Eraser", 100)
I3 = ITEM (102, "Sharpener")
I1.Buy (10)
I2.sell (25)
I3.Buy (75)
I3.showstock ()
I1.showstock ()
I2.showstock ()

```

- (f) What are the possible outcome(s) executed from the following code ? Also specify the maximum and minimum values that can be assigned to variable N. 2

```

import random
SIDES = ("EAST", "WEST", "NORTH", "SOUTH");
N = random.randint (1, 3)
OUT = " "
for I in range (N, 1, -1) :
 OUT = OUT + SIDES (I)
print OUT

```

|                |                     |
|----------------|---------------------|
| (i) SOUTHNORTH | (ii) SOUTHNORTHWEST |
| (iii) SOUTH    | (iv) EASTWESTNORTH  |

2. (a) List four characteristics of Object Oriented Programming. 2

(b) class Test :

```

rollno = 1
marks = 75
def _init_(self, r, m) : #function 1
 self.rollno=r
 self.marks = m
def assign (self, r, m) : # function 2
 rollno = n
 marks = m
def check (self) : # function 3
 print self.rollno, self.marks
print rollno, marks

```

- (i) In the above class definition, both the functions – function 1 as well as function 2 have similar definition. How are they different in execution ?
- (ii) Write statements to execute function 1 and function 2.
- (c) Define a class RING in Python with following specifications :

**Instance Attributes :**

```

- RingID # Numeric value with a default value 101
- Radius # Numeric value with a default value 10
- Area # Numeric value

```

**Methods :**

```

- AreaCal () # Method to calculate Area as
 # 3.14 * Radius * Radius
- NewRing () # Method to allow user to enter values of
 # RingID and Radius. It should also
 # Call Areacal Method
- ViewRing () # Method to display all the Attributes

```

- (d) Differentiate between static and dynamic binding in Python ? Give suitable examples of each. 2

- (e) Write two methods in Python using concept of Function Overloading (Polymorphism) to perform the following operations : 2

(i) A function having one argument as side, to calculate Area of Square as side \* side

(ii) A function having two arguments as Length and Breadth, to calculate Area of Rectangle as Length \* Breadth.

3. (a) What will be the status of the following list after the First, Second and Third pass of the bubble sort method used for arranging the following elements in descending order ? 3

Note : Show the status of all the elements after each pass very clearly underlining the changes.  
152, 104, – 100, 604, 190, 204

- (b) Write definition of a method OddSum (NUMBERS) to add those values in the list of NUMBERS, which are odd. 3
- (c) Write Addnew(Book) and Remove(Book) methods in Python to Add a new Book and Remove a Book from a List of Books, considering them to act as PUSH and POP operations of the data structure Stack. 4
- (d) Write definition of a Method AFIND(CITIES) to display all the City names from a list of CITIES, which are starting with alphabet A. 4  
For example :  
If the list CITIES contains  
("AHMEDABAD", "CHENNAI", "NEW DELHI", "AMRITSAR", "AGRA")  
The following should get displayed  
AHMEDABAD  
AMRITSAR  
AGRA
- (e) Evaluate the following Postfix notation of Expression : 2  
2, 3, \*, 24, 2, 6, +, /, –
4. (a) Differentiate between file modes r+ and w+ with respect to Python. 1
- (b) Write method in Python to read lines from a text file DIARY.TXT, and display those lines, which are starting with an alphabet 'P'. 2
- (c) Considering the following definition of class COMPANY, write a method in Python to search and display the content in a picked COMPANY.DAT, where CompID is matching with the value '1005'. 3
- ```
class company :
    def __init__(self, CID, NAM) :
        self.CompID = CID # compID company ID
        self.CName = NAM # CName Company Name
        self.Turnover = 1000
    def Display (self) :
        print self, CompID, ":", self.CName, ":", self.Turnover
```

SECTION - C
(For All the Candidates)

5. (a) Observe the following table CANDIDATE carefully and write the name of the RDBMS operation out of (i) SELECTION (ii) PROJECTION (iii) UNION (iv) CARTESIAN PRODUCT, which has been used to produce the output as shown in RESULT. Also, find the Degree and Cardinality of the RESULT. 2

TABLE : CANDIDATE

NO	NAME	STREAM
C1	AJAY	LAW
C2	ADITI	MEDICAL
C3	ROHAN	EDUCATION
C4	RISHAV	ENGINEERING

RESULT

NO	NAME
C3	ROHAN

- (b) Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) to (viii), which are based on the tables : 6

TABLE : BOOK

Code	BNAME	TYPE
F101	The Priest	Fiction
L102	German easy	Literature

C101	Tarran in the lost world	Comic
F102	Untold story	Fiction
C102	War heroes	Comic

TABLE : MEMBER

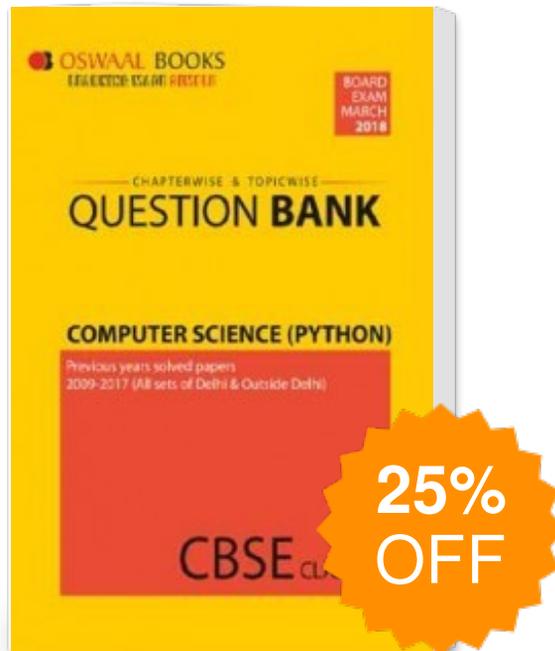
MNO	MNAME	CODE	ISSUEDATE
M101	RAGHAV SINHA	L102	2016-10-13
M103	SARTHAK JOHN	F102	2017-02-23
M102	ANISHA KHAN	C101	2016-06-12

- (i) To display all details from table MEMBER in descending order of ISSUEDATE.
(ii) To display the BNO and BNAME of all Fiction Type books from the table Book.
(iii) To display the TYPE and number of books in each TYPE from the table BOOK.
(iv) To display all MNAME and ISSUEDATE of those members from table MEMBER who have books issued (i.e., ISSUEDATE) in the year 2017.
(v) SELECT MAX (ISSUEDATE) FROM MEMBER;
(vi) SELECT DISTINCT TYPE FROM BOOK;
(vii) SELECT A.CODE, BNAME, MNO, MNAME
FROM BOOK A, MEMBER B WHERE A.CODE=B.CODE;
(viii) SELECT BNAME FROM BOOK
WHERE TYPE NOT IN ("FICTION", "COMIC");
6. (a) State Distributive Laws of Boolean Algebra and verify them using truth table. 2
(b) Draw the Logic Circuit of the following Boolean Expression using only NAND Gates : 2
 $X \cdot Y + Y \cdot Z$
(c) Derive a Canonical SOP expression for a Boolean function F, represented by the following truth table : 1

U	V	W	F (U, V, W)
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	0

- (d) Reduce the following Boolean Expression to its simplest form using K-Map : 3
 $F (X, Y, Z, W) = \Sigma (0, 1, 2, 3, 4, 5, 10, 11, 14)$
7. (a) Differentiate between Radio Link and Microwave in context of wireless communication technologies. 2
(b) Amit used a pen drive to copy files from his friend's laptop to his office computer. Soon his office computer started abnormal functioning. Sometimes it would restart by itself and sometimes it would stop functioning totally. Which of the following options out of (i) to (iv), would have caused the malfunctioning of the computer ? Justify the reason for your chosen option : 2
(i) Computer Worm
(ii) Computer Virus
(iii) Computer Bacteria
(iv) Trojan Horse
(c) Jai is an IT expert and a freelancer. He recently used his skills to access the Administrator password for the network server of Megatech Corpn Ltd. and provided confidential data of the organization to its Director, informing him about the vulnerability of their network security. Out of the following options (i) to (iv), which one most appropriately defines Jai ? 2

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