



Accept the situation and move  
on with a SMILE.

No matter whether a smile is  
FAKE or REAL.

@  
Because no one really cares.

– Pritesh Lad

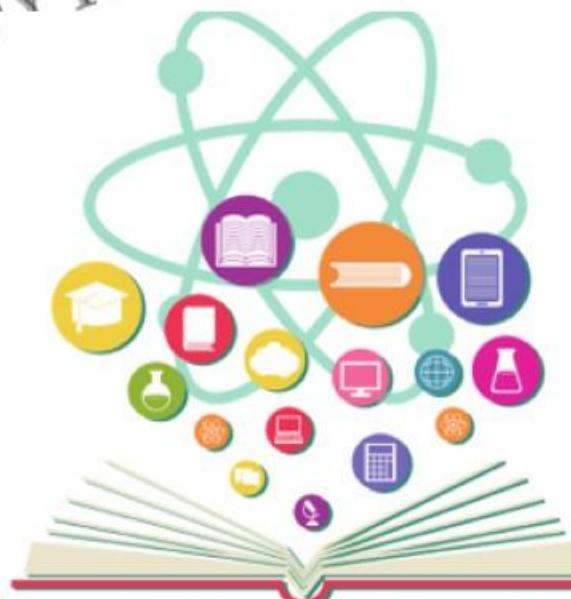


# PAPER 1 - ICT - UNIT 8

## DIGITAL INITIATIVES IN HIGHER EDUCATION



@UNIFY STUDY PAPER 1 - UNIT 8



UGC NET/SET COMPLETE COURSE JUNE 2024



NMEICT – FEB 3, 2009

NATIONAL MISSION ON EDUCATION THROUGH  
ICT

Administrator  
admiss  
Exam  
enrollment



One India One Digital Platform

Match SWAYAM Course to your Formal Learning Level

[Home](#) [About Us](#) [School](#) [Under Graduate](#) [Post Graduate](#) [Other Online Learning Platforms](#)

NMEICT

National Mission in Education through ICT

SAMARTH - eGov Suite

FOR UNIVERSITIES AND HIGHER EDUCATION INSTITUTES

+09

PROCESSES

+40

MODULES

+60

FEATURES

## Mission Document

MissionDocument [Download](#)MissionDocumentHindi [Download](#)

UGC NET/SET COMPLETE COURSE JUNE 2024

- The National Mission on Education through Information and Communication Technology (NMEICT) is a Centrally Sponsored Scheme launched by the Ministry of Human Resource Development (MHRD), Government of India, in 2009 to leverage the potential of ICT in teaching and learning process for the benefit of all the learners in Higher Education Institutions in any time any where mode.
- [a] no talent of the country should be allowed to go waste,
- [b] all the services available through the content delivery portal Sakshat should be free
- and [c] freely available material on the web should be used so as to avoid reinventing the wheel.

N PTEL + Workshop



- HIGH SPEED CONNECTIVITY
  - ✓ → Internet.
  - 1Gbps. → universities
- A-VIEW SOFTWARE
  - ✓ → teacher training.
  - Virtual classrooms
  - interactive learning Outcome
  - ebooks, ejournals
- CONTENT REPOSITORY
  - N-LIST →
    - SHANMUGAM → e Archarya
    - ↪ Inflibnet

# ICT



Unify Study  
United Information for You

NM EICT

School

Swayam

Swayam Prabha

NDU

Spoken Tutorial

NISHTHA

Under Graduate

Swayam

Swayam Prabha

NDLI

Spoken Tutorial

Fossee

e-Yantra

E-ShodhSindhu

Virtual Labs

Shodh Shudhhi

Samarth

Baadal

VIDWAN

eGyanKosh

Post Graduate

Swayam

Swayam Prabha

NDLI

Spoken Tutorial

Fossee

e-Yantra

E-ShodhSindhu

Virtual Labs

Shodh Shudhhi

e-PG Pathshala

Samarth

Baadal

VIDWAN

Other Online Learning P

IIT Bx

IIM Bx

Electronics & ICT Academy

NEAT - AICTE

NROER

DIKSHA

SHAGUN

e-Pathshala

Video Conference & LMS

National  
Repository  
Open Educat  
Resource

↳ Kolpa  
↳ eadage

# NCERT - National Council of Educational Research and Training

- NCERT establishment: Founded by Indian Government in 1961. *Concurrent List ? 1976*
- Policy advisory role: Advises Central and State Governments on education policies.
- Research and coordination: Conducts and coordinates research in school education.
- Textbook development: Creates model textbooks, supplementary materials, and digital resources.
- Teacher training: Offers pre-service and in-service training programs.
- Innovation promotion: Promotes innovative educational techniques and practices.
- Stakeholder collaboration: Works with state departments, universities, and NGOs.
- Information hub: Acts as a clearing house for educational information.
- Universal Elementary Education: Nodal agency for achieving universal education goals.
- Cultural exchange: Implements bilateral programs in education.
- International collaboration: Collaborates globally and provides training to educational personnel.

SCERT



# NCERT CONSTITUTENT UNITS



- National Institute of Education (NIE), New Delhi
- Central Institute of Educational Technology (CIET), New Delhi
- Pandit Sundarlal Sharma Central Institute of Vocational Education (PSSCIVE), Bhopal
- Regional Institute of Education (RIE), Ajmer
- Regional Institute of Education (RIE), Bhopal
- Regional Institute of Education (RIE), Bhubaneswar
- Regional Institute of Education (RIE), Mysore
- North-East Regional Institute of Education (NERIE), Shillong

National Repository  
Open Education  
Resources

NATIONAL INSTITUTION OF EDUCATION TECHNOLOGY (NIE)

(AB)(B.M.S)

- SWAYAM hosts free courses from Class 9 to post-graduation. → MOOCs (Massive Open Online Courses)
- Courses are accessible anywhere, anytime.
- 4 QUADRANTS:
  - Q1 • Content includes video lectures
  - Q2 • downloadable reading materials.
  - Q3 • Self-assessment tests are available.
  - Q4 • Online discussion forums for clearing doubts.

1. **AICTE** (All India Council for Technical Education) for self-paced and international courses
2. **NPTEL** (National Programme on Technology Enhanced Learning) for Engineering
3. **UGC** (University Grants Commission) for non technical post-graduation education
4. **CEC** (Consortium for Educational Communication) for under-graduate education
5. **NCERT** (National Council of Educational Research and Training) for school education
6. **NIOS** (National Institute of Open Schooling) for school education
7. **IGNOU** (Indira Gandhi National Open University) for out-of-school students
8. **IIMB** (Indian Institute of Management, Bangalore) for management studies
9. **NITTTR** (National Institute of Technical Teachers Training and Research) for Teacher Training programme

ANU CAN IN



## SWAYAM - G - Ordinators



School Education



Out-of-School Education



Under-Graduate Education



Post-Graduate Education

NIOS ✓

NCERT

Curriculum Institutes of Open Schooling

IGNOU ✓

NITTTR ✓

NPTEL ✓

AICTE ✓

CEC ✓

IIMB ✓

NPTEL ✓

AICTE ✓

IIMB ✓

UGC ✓



https://swayamprabha.gov.in

→ Channels.



DOWNLOAD | ? FAQS | 📕 HELP MANUAL | 💬 FEEDBACK | 📞 CONTACT (Channels) | ► CHANNELS AND ALLOCATION ▾

Registration

Login



Home

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Search

Higher Education

School Education

SATHEE(Exam)



Recent Updates

'DD SWAYAM Prabha' chanr

UGC NET/SET COMPLETE COURSE JUNE 2024



- SWAYAM PRABHA has **40** DTH channels for educational programs.
  - Broadcasting educational content **24/7** via GSAT-15 satellite.
  - Daily new content for at least 4 hours.
  - Content repeated 5 times a day for flexibility.
  - Programs provided by IITs, UGC, CEC, IGNOU.
  - Uplinked from **BISAG-N**, *Bhartkarchange Institute of Space Applications and Technology*.
  - Web portal maintained by INFLIBNET Centre.
- 1991

↳ SIE → 40 channels  
 SE → 200 channels (12)  
 CE → 8 channels  
 Sathee, ULASI BHARATHI are running  
 ↳ 24/7  
 ↳ GSAT satellite  
 Geosynchronous satellite  
 ↳ 4 hrs  
 ↳ 5 times a day  
 ↳ IIT, VNC, CEC, IGNOU, UOH.



CH. NO.	CHANNEL NAME	ROUTE/PARENT
1	CH 01: VAGEESH: CEC- UGC 01: Language and Literature	CEC, New Delhi
2	CH 02: SANSKRITI: CEC- UGC 02: History, Culture & Philosophy	CEC, New Delhi
3	CH 03: PRABODH: CEC- UGC 03: Social & Behavioral Sciences	CEC, New Delhi
4	CH 04: SAARASWAT: CEC-UGC 04: Education and Home Science	CEC, New Delhi
5	CH 05: PRABANDHAN: CEC-UGC 05: Information, Communication and Management Studies	CEC, New Delhi

High Education  
 1-10 ATHIL → CEC.  
 40 Channels =  
 VS P S P



6

CH 06: VIDHIK: CEC-  
UGC 06: Law and Legal  
Studies

CEC, New Delhi

V K ASD

7

CH 07: KAUTILYA: CEC-  
UGC 07: Economics  
and Commerce

CEC, New Delhi

P Y Q

RATHI

Vidhik - Law

Kautilya → Economics  
Commerce

Aryabhatta → Finance  
Physical & Earth  
Science

Spandan → LifeScien

8

CH 08: ARYABHATT:  
CEC-UGC 08: Physical  
and Earth Sciences

CEC, New Delhi

9

CH 09: SPANDAN: CEC-  
UGC 09: Life Sciences

CEC, New Delhi

10

CH 10: DAKSH: CEC-  
UGC 10: Applied  
Sciences ✓

CEC, New Delhi



11	CH 11: IGNOU 01: <u>Social Sciences &amp; Humanities</u>	IGNOU, New Delhi
12	CH 12: IGNOU 02: Basic and Applied Sciences	IGNOU, New Delhi
13	CH 13: IGNOU 03: Professional Education	IGNOU, New Delhi
14	CH 14: IGNOU 04: State <u>Open Universities</u> and Gyandarshan	IGNOU, New Delhi
15	Ch 15: IGNOU 05: Capacity Building and Teacher Education	IGNOU, New Delhi
16	CH 16: IGNOU 06: Skill and Vocational Education	IGNOU, New Delhi

Channel 11 - 16 → C1N00

→ SS ✓

→ Sci ✓

→ Prof ✓

→ Open ✓

→ Teacher ✓

→ VG ✓

PAPER PAPER BHARATHI

CH 11 → SS  
 CH 12 → SCI  
 CH 13 → PE  
 CH 14 → OO  
 CH 15 → TE  
 CH 16 → VE



Channel 17 - 20

IIT B

17-38-11T

17-20-11T IIT Bombay

21-22-  
THULASI BHARATHI Delhi

23 → " Gandhinagar

24-28 → " Kanpur

29-30 → " Kharagpur

31-36 → " Madras

37-38 → " Tirupati

39 → UOT

40 → Vys. CBS

17	CH 17: IIT BOMBAY 01: Biotechnology and Biochemical Engineering	IIT Bombay
18	CH 18: IIT BOMBAY 02: Electronics and Communication Engineering	IIT BOMBAY
19	CH 19: IIT BOMBAY 03: Electrical Engineering	IIT Bombay
20	CH 20: IIT BOMBAY 04: Physics	IIT BOMBAY



21	CH 21: IIT DELHI 01: Textile Engineering	IIT Delhi ✓
22	CH 22: IIT DELHI 02: IIT PAL	IIT Delhi ✓
23	CH 23: IIT GANDHINAGAR 01: Civil Engineering	IIT Gandhinagar <del>✓</del>
24	CH 24: IIT KANPUR 01: Aeronautical Engineering	IIT Kanpur
25	CH 25: IIT KANPUR 02: Humanities and Social Sciences	IIT Kanpur
26	CH 26: IIT KANPUR 03: Management, Law, Economics; Business Analytics, Communication, Cooperative Management	IIT Kanpur
27	CH 27: IIT KANPUR 04: Mechanical Engineering, Engineering Design, Manufacturing E & T and allied subjects	IIT Kanpur
28	CH 28: IIT KANPUR 05: Visual communications, Graphic design, Media technology	IIT Kanpur

Ch 22: IIT Delhi

↳ PAL.

Professor

Assisted Learning

ULASI BHARATHI

Ch 24 - 28



29

CH 29: IIT KHARAGPUR  
01: Architecture &  
Interior Design

IIT Kharagpur

Ch 29 &amp; 30

30

CH 30: IIT KHARAGPUR  
02: Computer Sciences  
Engineering / IT &  
Related Branches

IIT Kharagpur

@UNIFY STUDY PAPER 1 THULASI BHARATHI

31

CH 31: IIT Madras 01:  
Instrumentation,  
Control and Biomedical  
and Engineering

IIT Madras

# ICT

32

CH 32: IIT Madras 02:  
Bridge Courses, Impact  
Series

IIT Madras

33

CH 33: IIT Madras 03:  
Chemical Engineering,  
Nanotechnology,  
Environmental and  
Atmospheric Sciences

IIT Madras

34

CH 34: IIT Madras 04:  
Health Sciences

IIT Madras

35

CH 35: IIT Madras 05:  
Metallurgical and  
Material Science  
Engineering, Mining  
and Ocean Engineering

IIT Madras

36

CH 36: IIT Madras 06:  
Skills and Logistics (IT -  
Enabled Sector,  
Banking, Financial and  
Insurance sector Skills  
Logistics, Supply Chain  
Management and  
Transportation, Life  
skills)

IIT Madras

Ch 31 - 36



Unify Study  
United Information for You

PAPER 1 THULASI BHARATHI



37	CH 37: IIT TIRUPATI 01: Chemistry, Biochemistry and Food Processing Engineering	IIT Tirupati
38	CH 38: IIT TIRUPATI 02: Mathematics	IIT Tirupati
39	CH 39: UoH: <u>Performing Arts</u> (Indian Classical Music and Dances), Theatre Arts, Film making and Painting	University of Hyderabad
40	Vyas - UGC	CEC, New Delhi

Ch 37, 38 - IIT Tirupati  
 17- 38 → BHARATHI → give Content  
 PER 1 THULASI BHARATHI → give Content  
 1 - 10 - CEC  
 11-16 - IIT NOU  
 17-38 - IIT (Bombay, Delhi, Kanpur  
 Lucknow, Madras Tirupati  
 Kharagpur)  
 39 → VYAS  
 40 → VYAS → CEC.



## PM EVIDYA

- PM eVidya is a unique and innovative venture by the Ministry of Education Government of India to facilitate multi-mode access to digital/online teaching-learning contents of various types among students and teachers. The uniqueness of the PM e-Vidya lies with its comprehensive accessibility for all as it caters the education content to all with its multi-mode set-up of remote learning platforms including Internet, radio, community radio, podcast, and TV.



- One of the significant initiatives of PM eVidya is creating 12 (now 200) PM eVidya TV channels on **One Class-One channel to broadcast educational content related to classes 1 to 12.** *PM eVidya 1 Direct To Home*
- PM eVidya DTH channels benefit learners in remote areas where stable internet is not available. *PM eVidya = 12*
- These channels broadcast curriculum-based educational content developed by NCERT and other agencies like **CBSE, KVS, NIOS, Rotary, etc.** Video content has been developed in Hindi, English, and Regional languages. *Quick Response*
- **QR codes** have been placed on these video content, which, when scanned using **the Diksha mobile app**, will take users to the same content on the **Diksha portal.**



# Digital Infrastructure for Knowledge Sharing 2017

[Skip to navigation](#) [Skip to main content](#)



Ministry of Education  
Government of India

[DIKSHA](#)[SWAYAM Portal](#)[SWAYAM Prabha TV](#)[Radio](#)[e-Content for CWSN](#)[Online Coaching for Competitive Exams](#)[Hindi](#)

- Store house of large number of eBooks and e-Contents
- Availability of e-Textbooks of NCERT and related e-Contents, mapped with QR Codes
- Content available in 15 languages and relates to grades 1-12

18



LAPTOP  
MODERN  
EDUCATION  
INTERNET  
BOOK  
WEB  
SCHOOL  
ELECTRONIC  
KNOWLEDGE  
UNIVERSITY  
TEACHING  
STUDY  
DIGITAL  
NET-LEARNING  
COMUNICATION  
MEDIA

# E-LEARNING TECHNOLOGY COMPUTER





# DIKSHA

- DIKSHA (**Digital Infrastructure for Knowledge Sharing**) has been formally launched by the Hon'ble Vice President of India on 5<sup>th</sup> September 2017.
- Honorable Venkaiah Naidu launched DIKSHA.
- For Students, Teachers, and Parents:
- **Features of DIKSHA Portal**
  - Here are some important features of DIKSHA portal for easy access of students:
    - **QR Code Access:** Scan QR code in NCERT books for National Digital Infrastructure.
    - **Language Options:** Portal available in English and 18 other languages for user comfort.
    - **Location-Based:** Select location and sub-location for region-specific course suggestions.
    - **Class-Based:** Choose class for accessing relevant study material on DIKSHA portal.



**Scan QR Code**  
Access content anywhere anytime

Scan QR Code

Point your phone at the QR Code to scan it.

DARBZ5

**Free Online Library**  
Access textbooks, resources, videos and more

English Medium    Hindi Medium    Urdu Medium

Class 5    Class 6    Class 7    Class 8    Class 9

**Recently Viewed**

- Honeycomb English - Class 7
- Mathematics
- Mathematics Part 01 Mathematics - Class 07
- Mathematics Part 02 Mathematics - Class 07

Library    Courses    Downloads    Profile

**Online Teacher Trainings**  
~~Learn and master teaching skills~~

Digital proficiency training - for teachers by NCTE

Join Training

2 batches available

Training Information    Training Modules

Certified Training

Training is relevant for teachers of:  
Class: 8, 9, 10  
Subject: All  
Medium: English, Hindi

Training Details  
Training end date: 31 Dec 2019

This course focuses on holistic development of teachers who really want to excel in their everyday business

NC TE  
National  
Council  
of  
Teacher  
Education  
1995

# SATHEE COMPETITIVE EXAM

MOE & IIT Kanpur



- SATHEE (**Self-Assessment Test and Help for Entrance Exams**) is a partnership between the **Ministry of Education** and **IIT Kanpur**.
- It offers an online platform with study materials, practice tests, and personalized guidance for competitive exam preparation.
- SATHEE extends its reach through DTH TV and web platforms.
- ~~Seven~~<sup>8</sup> channels cater to various stream exams, aiding students and job seekers nationwide.
- Represents a significant step in implementing the National Education Policy 2020.



CH. NO.	CHANNEL NAME	ROUTE/PARENT
1	CH 01: SATHEE-ENGINEERING	IIT Kanpur
2	CH 02: SATHEE-MEDICAL	IIT Kanpur
3	CH 03: SATHEE-LAW	IIT Kanpur
4	CH 04: SATHEE-AGRICULTURAL	IIT Kanpur
5	CH 05: SATHEE-SSC	IIT Kanpur
6	CH 06: SATHEE-BANK	IIT Kanpur
7	CH 07: SATHEE-RRB (Railway)	IIT Kanpur
8	CH 40: SATHEE	Manipur University, Imphal

Eng meenj  
 Medicin  
 Law  
 + channel  
 A paper of THULASI BHARATHI  
 SSC ✓  
 Bank ✓  
 Railway ✓



SWAYAM	Study Webs of Active-Learning for Young Aspiring Minds - MOOC	2017, 4 QUADRANTS, ANU CNN IIN
SWAYAM PRABHA	DTH, GSAT-15 - INFLIBNET - BISAG - GUJARAT- 24/ 7, 5 TIMES - 4HRS/DAY ,	2017 , HE-40, SE-200,CE- 40 UGC,IIT,CEC, IGNOU,UOH
NDL- NATIONAL DIGITAL LIBRARY	Access e-content on multiple disciplines IIT KHARAGPUR	2016,
E-VIDWAN	EXPERT DATABASE <i>University Expert Database (1999)+ Expert Database in Science and Technology ( 2001)</i> = E-VIDWAN	(2012)
NAD – NATIONAL ACDEMIC REPOSITORY	digital issuance, storage, access and verification of Academic Awards	2017
FOSSEE	Free/Libre and Open Source Software for Education IIT BOMBAY	2017
VIRTUAL LAB	remote access to Laboratories in various disciplines of Science and Engineering	
SHODHGANGA	SOFT COPIES OF PHD THESIS	2009
SHODH SUDHI @	PLAGARISM DECTECTION SOFTWARE Ouriginal	2019
SHODHGANGOTRI	synopsis of research topic submitted to the universities	
SHODH SINDHU	e-ShodhSindhu was formed with merger of three consortia, namely UGC-INFONET Digital Library Consortium, NLIST and INDEST-AICTE Consortium – JOURNALS	2015



E-KALPA	Creating Digital-learning Environment for Design (DSOURCE)	2015
E-YANTRA	incorporate Robotics into engineering education – IIT BOMBAY	2002
E-GRANTALAYA	transform traditional libraries to e-Library with Digital Library Services	
INFLIBNET	Information and Library Network - modernizing university libraries	1991, IUC-1996
E-ACHARYA	E CONTENT PORTAL	2000
SPOKEN TUTORIAL		2009
SAKSAHAT		
NPTEL		
EPGPATHSALA		
INDIAN KNOWLEDGE SYSTEMS		
SAMARTH		
ACADEMIC BANK OF CREDITS		
DIKSHA		



Given below are two statements:

**Statement I:** The channels of SWAYAM PRABHA are uplinked from BISAG, Hyderabad. *Grandi nager*

**Statement II:** SWAYAM PRABHA is an education learning platform available 24×7 through ~~37~~<sup>40</sup> higher education DTH channels.

In the light of the above statements, choose the correct answer from the options given below:

- (a) Both Statement I and Statement II are true
- (b) Both Statement I and Statement II are false
- (c) Statement I is true but Statement II is false
- (d) Statement I is false but Statement II is true



List-I (Channel number of SWAYAM PRABHA)	List-II (Name)
A. Channel 03	I. PRABANDHAN → Mangal SP SP
B. Channel 04	II. VIDHIK → Law
C. Channel 05	III. PRABODH → SS
D. Channel 06	IV. SAARASWAT → Edus

Match List-I with List-II

Choose the correct answer from the options given below.

- (a) A-I B-IV C-III D-II
- (b) A-II B-III C-IV D-I
- (c) A-IV B-II C-I D-III
- (d) A-III B-IV C-I D-II



LIST-I (Channels of SWAYAM Prabha)	LIST-II (Subjects covered)
A. Channel 03: <b>PRABODH</b>	I. Social Science-3, Management, Library sciences, Information Science and related subjects.
B. Channel 04: <b>SAARASWAR</b>	I. Social science-1, Social and Behavioural sciences.
C. Channel 05: <b>PRABANDHAN</b>	II. Social science-4, Law, Legal studies, Human rights and related subjects.
D. Channel 06: <b>VIDHIK</b>	II. Social science-2, Education, Psychology, Home science and related subjects.

**Match List I with List II**  
**Choose the correct answer from the options given below**

- |     |       |      |       |       |
|-----|-------|------|-------|-------|
| (a) | A-II  | B-IV | C-1   | D-III |
| (b) | A-IV  | B-I  | C-II  | D-III |
| (c) | A-IV  | B-II | C-III | D-I   |
| (d) | A-III | B-II | C-IV  | D-I   |

Ans 15  
YF  
10:00 am  
8:00 pm  
App  
Mocktest



**SESSION2-ICT**

**01-04-2024**

@UNIFY STU

ASI BHARATHI

Ministry of Education  
Government of IndiaNational  
Digital Library  
of IndiaDEVELOPED BY  
Indian Institute of Technology  
Kharagpur

NDLI

Search over 100,317,720 resources

English

Search

purpose

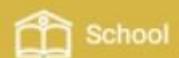
estd.  
who

## TEST PREPARATION

2016

CBSE Examination  
PreparatoryIIT-JEE  
NEET IIT-JEE and NEETJoint Admission test  
for Masters (JAM)Graduate Aptitude Test  
in Engineering (GATE)National Eligibility Test  
(UGC NET)Career Development  
and Recruitment

## STUDY AT HOME



School



Engineering



Science



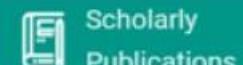
Humanities



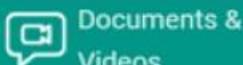
Literature

Law &  
Management

## COVID-19 RESEARCH REPOSITORY

Scholarly  
Publications

Data Sets

Documents &  
VideosJournals &  
ConferencesIdeas &  
FundingChallenges &  
Startup

## FEATURED COLLECTIONS

UGC NET/SET COMPLETE COURSE JUNE 2024

# NDLI - National Digital Library of India -2016



2018

- provides a host of services including textbooks, articles, videos, audiobooks, lectures, simulations, fiction, and all other kinds of learning media for the learners/users community.
- Pilot launch: May 2016
- Dedicated to the nation: June 19, 2018, by Union HRD Minister Prakash Javadekar

- Sponsored by Ministry of Education, Govt. of India
- Developed by IIT Kharagpur
- Integral to NMEICT
- Single-window platform for diverse digital learning resources
- Accessible to all demographics

[HOME](#) [ABOUT US](#) [DOWNLOAD](#) [LOGIN](#) [REGISTRATION](#) [FEEDBACK](#)

Vidwan-ID : 338116

[Edit Profile](#)

Vidwan Score 6.1

5 ARTICLES 1 BOOKS 1 AWARDS

Ms THULASI BHARATHI

SRIDHARAN

Assistant Professor

St.Joseph's College

Publications 2018 - 2023



## Profile

- Personal Information
- Expertise Information
- Experience
- Education Qualification
- Honours and Awards
- Professional Bodies

## Publications

5 Journal Articles    1 Book    1 Awards

Similar Experts (9418)

 Partha Pratim Chakrabarti  
Computer Science  
Artificial Intelligence Sujoy Ghosh  
Computer Science  
Artificial Intelligence Anupam Basu  
Computer Science  
Artificial Intelligence Malati Hegde  
Computer Science  
Artificial Intelligence Anandi Giridharan  
Computer Science  
Artificial Intelligence[View More](#)

Same Organisation (1635)



# E-VIDWAN- Expert Database and National Researcher Network-2012

## HISTORY:

- University Expert Database launched in 1999 for academic experts.
- Expert Database in Science and Technology developed in 2001 for R&D experts.
- Merged in 2012 to form VIDWAN with modern features.
- EXPERT DATABASE *University Expert Database (1999)+ Expert Database in Science and Technology (2001)*
- = E-VIDWAN

- VIDWAN: Premier database of scientists/researchers in India.  
*Information & Library Network*
- Developed by INFLIBNET with NME-ICT support.
- Provides expert profiles, contact info, publications, skills.
- Used for expert selection in govt. committees.



https://nad.gov.in/index.html



A<sup>W</sup>



...



Government of India | Ministry of Education



Skip to main content

Skip to navigation



NATIONAL ACADEMIC DEPOSITORY (NAD)  
University Grants Commission

nibble, bit



NATIONAL ACADEMIC DEPOSITORY  
Transparency & Transformation Through Digitization

Home

About NAD

Benefits

FAQ

Contact

Academia

Student

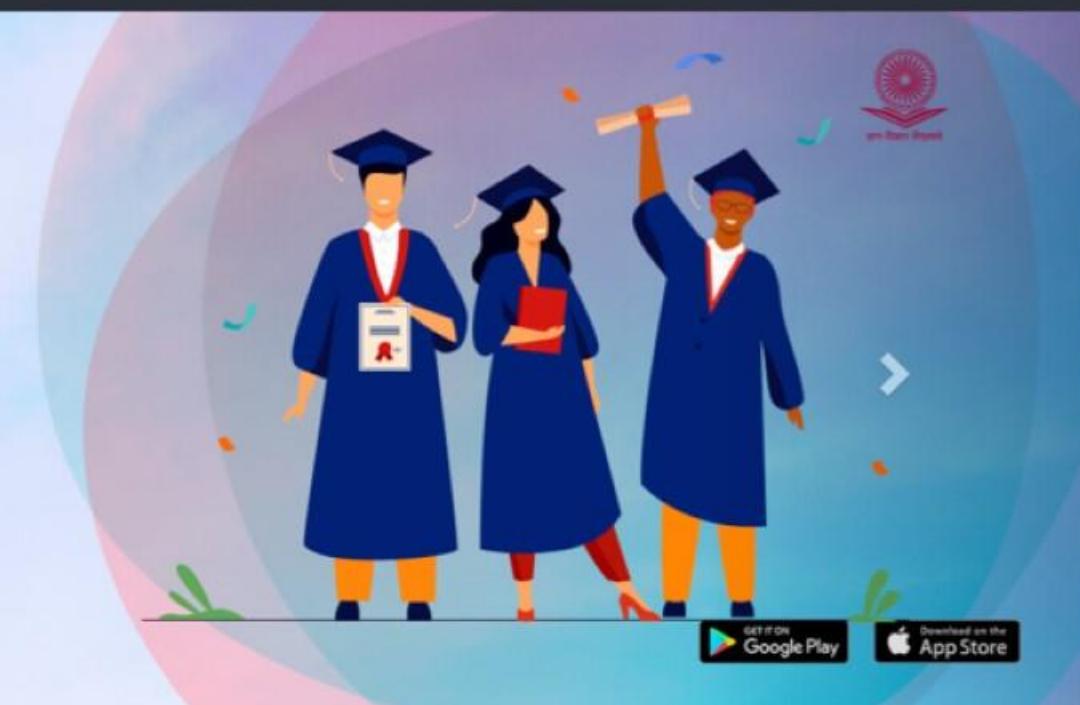
Verifier



## National Academic Depository Brings Academic Awards into Students Locker

UGC NAD is a 24x7 Online Storage for Accessing and Verification of Awards

Register Now



GET IT ON  
Google Play      Download on the  
App Store



UGC NET/SET COMPLETE COURSE JUNE 2024



# NAD - National Academic Depository - 2017

↳ DigiLocker

- NAD: 24x7 online repository for academic awards.
- Stores certificates, degrees, mark-sheets digitally.
- Ensures easy access, authenticity validation, and safe storage.
- The Ministry of Education (MoE) has designated University Grants Commission (UGC) as an authorized body to implement NAD as a permanent scheme by a single depository i.e. DigiLocker an entity owned by the Ministry of Electronics and Information Technology (MeitY).



## NATIONAL ACADEMIC DEPOSITORY

Transparency & Transformation Through Digitization  
Organisation logo.

<b>Abbreviation</b>	NAD
<b>Formation</b>	17 July 2017 (6 years ago)
<b>Type</b>	Government Scheme
<b>Headquarters</b>	New Delhi, India
<b>Parent organization</b>	University Grants Commission (UGC), Ministry of Education (MoE)
<b>Website</b>	<a href="http://nad.gov.in">nad.gov.in</a>



A horizontal banner for the ANIMATE 2024 conference. On the left, there's a blue circular logo with a gear and a stylized tree, followed by the text "fossee" in a red box with "DESIGNE" underneath. Below this, the text "FOSSEE MT BOMBAY Presents" is written in red. To the right is a white triangle pointing right, containing a silhouette of a person pointing upwards towards a lightbulb. The word "ANIMATE" is written in large, bold, white letters, with "2024" in smaller letters to its right. Below "ANIMATE" is the tagline "Create | Express | Inspire". To the right of the main title are several white icons on a red background: a clock, a gear, a target, a lightbulb, a person at a desk, and a person holding a megaphone. A large white square is on the far right.



NME/C

[Home](#) [Statistics](#) [About](#) [FOSSEE Club](#) [Testimonials](#) [Resources](#) [Join Us](#) [Internships](#) [Events](#)



*"The most unfortunate thing is that India still seems to believe in proprietary solutions. Further spread of IT which is influencing the daily life of individuals would have a devastating effect on the lives of society due to any small shift in the business practice involving these proprietary solutions. It is precisely for these reasons open source software need to be built which would be cost effective for the entire society.*

*In India, open source code software will have to come and stay in a big way for the benefit of our billion people."*

- Dr. A.P.J. Abdul Kalam

## Projects

FOSSEE (Free/Libre and Open Source Software for Education) project promotes the use of FLOSS tools in academia and research. The FOSSEE project is part of the National Mission on Education through Information and Communication Technology (ICT), Ministry of Education (MoE), Government of India. Below is the list of projects which are promoted by FOSSEE.



# FOSSEE -Free/Libre and Open Source Software for Education -2008- IIT BOMBAY

FOSSEE develops and promotes various open-source software tools for use in teaching, learning, and research across different disciplines. The initiative also conducts workshops, training programs, and creates educational resources to support educators, students, and researchers in utilizing open-source software effectively.

~~Scilab~~: Numerical computing software.

~~Python~~: Versatile programming language.

~~eSim~~: Electronic design automation tool.

~~Osdag~~: Structural engineering GUI platform.

~~DWSIM~~: Chemical process simulator.

~~OpenFOAM~~: Computational fluid dynamics software.

- ~~OpenModelica~~: Modelica-based simulation environment.
- ~~OpenPLC~~: Open-source PLC software for industrial automation.
- FLOSS ~~Arduino~~: Open-source Arduino platform.
- ~~Single Board Heater System~~: Educational thermal dynamics platform.
- ~~R Language~~: Statistical computing language.
- ~~QGIS~~: Open-source GIS software.
- ~~FOCAL Soul~~: Finite element analysis software.



An MoE Project

National Mission on Education through ICT  
(NME-ICT)[HOME](#)[STUDENT CORNER](#)[QUIZ](#)

Welcome to

## e-PG Pathshala

A Gateway to all Post Graduate Courses

### About e-PG Pathshala

e-PG Pathshala is an initiative of the MHRD under its National Mission on Education through ICT (NME-ICT) being executed by the UGC.

[Read More](#)

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# e-PG Pathshala – NMEICT -2014



## e-Adhyayan (e-Books)

e-Adhyayan is a platform to provide 700+ e-Books for the Post-Graduate Courses. All the e-Books are derived from e-PG Pathshala courses. It also facilitates play-list of video content.



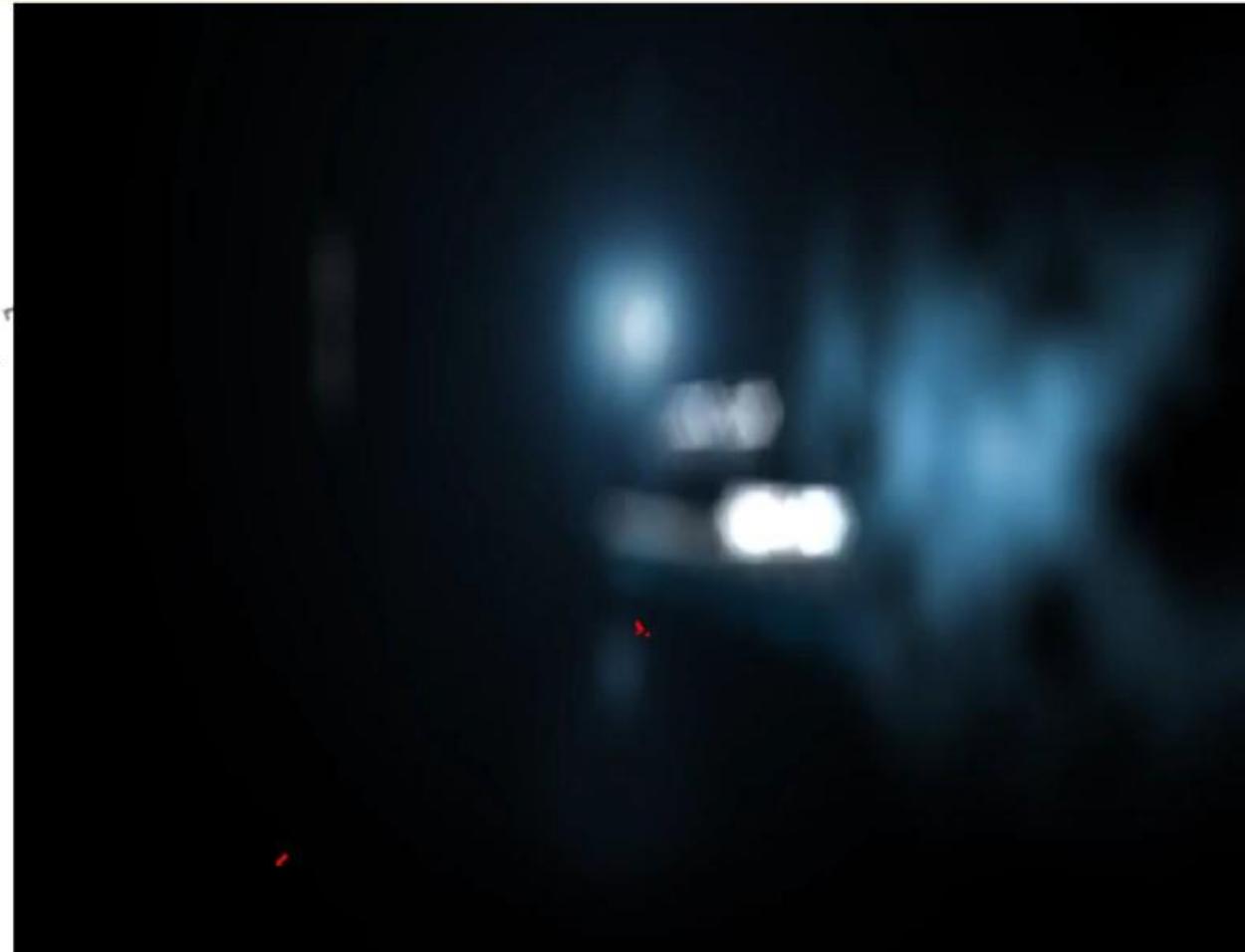
## UGC MOOCs (Online Courses)

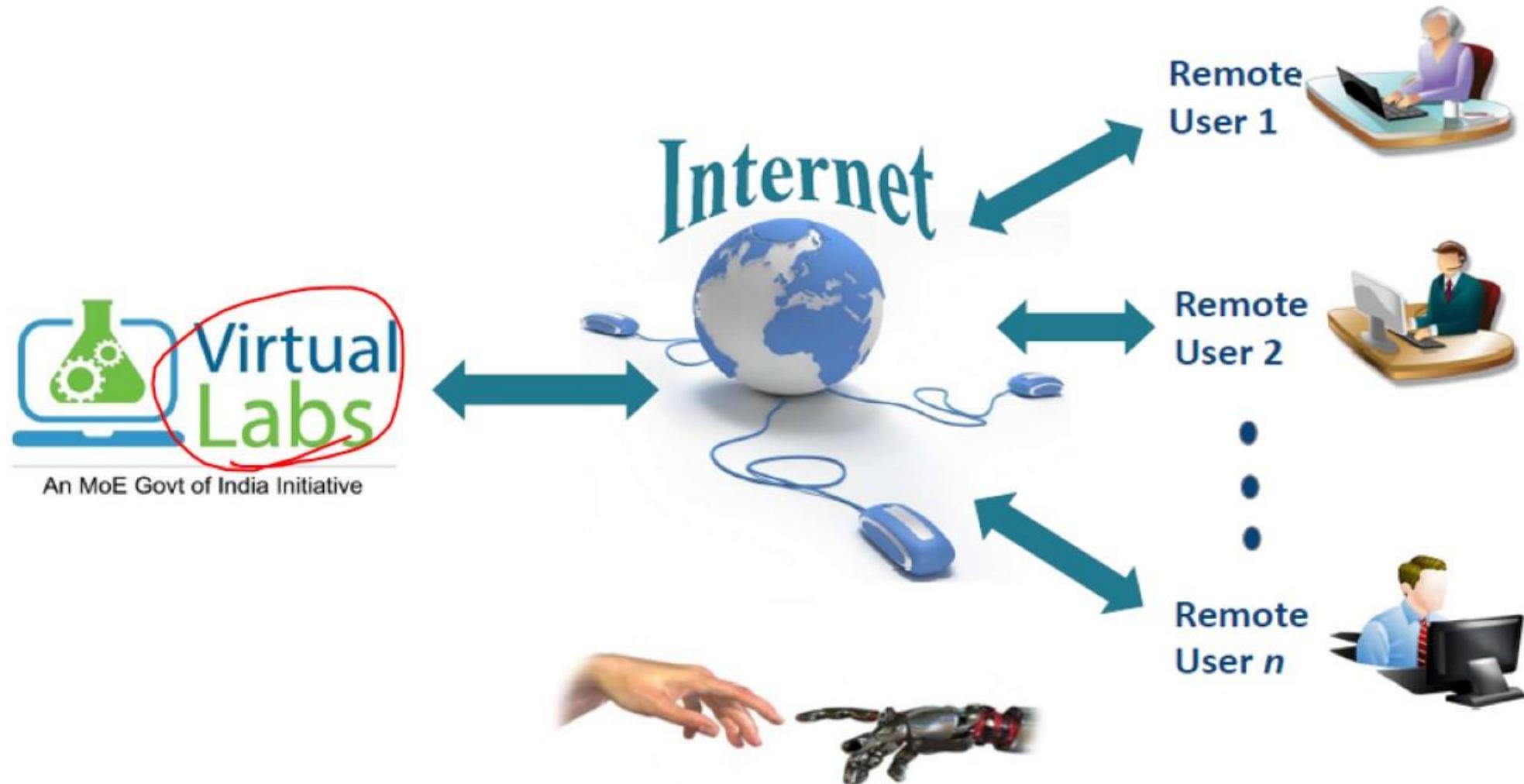
UGC-MOOCs is one of vertical to produce course on Post Graduate subjects in SWAYAM (Online Courses, An MHRD initiatives). UGC is one of the national coordinator of SWAYAM & INFLIBNET is technical partner for UGC-MOOCs.



## e-Pathya (Offline Access)

e-Pathya is one the verticals of e-PG Pathshala which is software driven course / content package that facilitates students pursuing higher education (PG level) in distance learning as well as campus learning mode. it also facilitate offline access.





# VIRTUAL LABS- PILOT PHASE **2009** – MAIN PHASE – **APRIL 2010**

- Virtual Labs: MoE initiative under NMEICT.
- Coordinated by IIT Delhi WITH total of **11 participating institutes** in the consortium
- Introduces remote experimentation.
- Offers 100+ Virtual Labs with 700+ web-enabled experiments.
- The simulations-based experiments can be accessed remotely via internet.





# Repository of Research in Progress & PG Dissertations

[HOME](#)[SEARCH & BROWSE](#)[GUIDE & TUTORIALS](#)[DOWNLOAD](#)[LOGIN](#)

## Repository of Research in Progress/Synopses MRPs/ PDFs/ Emeritus Fellowship Reports

Search Synopsis in Shodhgangotri

[Advanced Search](#)[Browse Title](#)

TOTAL

13663

SYNOPSIS

13575

MRPs

26

PDFs

46

Fellowship

5

PG Dissertations

5

UGC NET/SET COMPLETE COURSE JUNE 2024



## Shodhganga :

Shodhganga: a reservoir of Indian theses is a digital repository of theses and dissertations submitted to universities in India. [Wikipedia](#)

**Access requirements:** Free digital access, online and downloadable

**Director:** J P Singh Joorel; Manoj Kumar K; Scientist-E (CS)

**Established:** 2011

**Location:** India

**Parent organisation:** INFLIBNET Centre, University Grants Commission (UGC), Ministry of Education, Government of India

**Reference to legal mandate:** UGC (Minimum Standards and Procedure for Award of M.PHIL./PH.D Degrees) Regulations, 2016

**Size:** 359378 full-text thesis; 8657 synopses

- Synopsis in "ShodhGangotri" would later be mapped to full-text theses in "ShodhGanga".
- As such, once the full-text thesis is submitted for a synopsis, a link to the full-text theses would be provided from ShodhGangotri to "ShodhGanga".



+91 79 2326 8241/42

Search-an-article



ICT Initiatives by Ministry of Education

[f](#) [t](#) [eshodhsindhu\[at\]inflibnet.ac.in](mailto:eshodhsindhu[at]inflibnet.ac.in)[Home](#)[About](#)[Members](#) ▾[E-Resources](#) ▾[Search](#)[INFED](#)[InfiStats](#)

## Welcome to e-ShodhSindhu: Consortium for Higher Education Electronic Resources

Provides access to e-resources to Universities, Colleges and Centrally Funded Technical Institutions in INDIA.



An Initiative by Ministry of Education, Govt of India



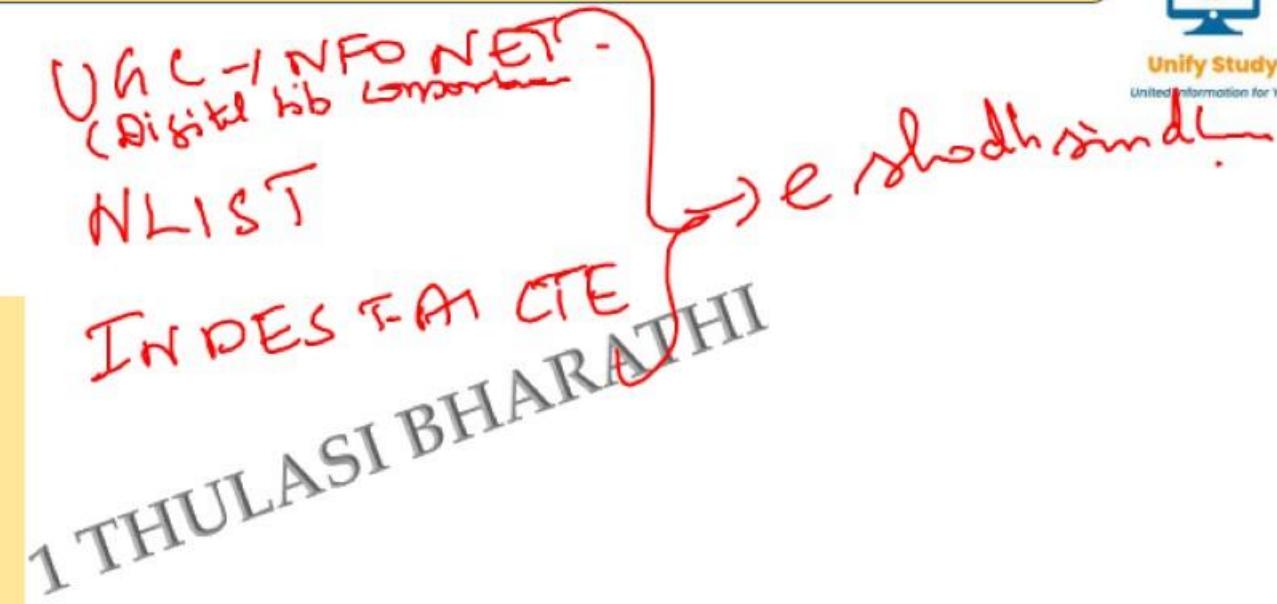
Being Executed by INFLIBNET Centre

[Read More](#)[Online e-Resources Requisition System](#)

# UGC NET/SET COMPLETE COURSE JUNE 2024

# ESHODHSINDHU

- Ministry of Education merges UGC-INFONET, NLIST, and INDEST-AICTE Consortia to form e-ShodhSindhu.
- Provides access to 10,000+ core and peer-reviewed journals, databases.
- Available to member institutions including centrally-funded technical institutions, universities, and colleges under UGC Act.





**N-LIST**  
National Library and Information Services  
Infrastructure for Scholarly Content  
extending access to e-Resources to colleges in India

College Admin Login   Licences and Fair Use   FAQs   Downloads   Awareness Programme

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A college component of e-ShodhSindhu consortium with access to 6,000+ journals, 1,99,500+ ebooks under N-LIST and 6,00,000 ebooks through NDL.

READ MORE

## ✓ Who are eligible?

All colleges covered under Sections 12(B) and 2(f) of the UGC Act.

Non-Aided colleges (except Agriculture, Engineering, Management, Medical, Pharmacy, Dentistry and Nursing).

JOIN

## REGISTERED MEMBER'S LOGIN

Important for the colleges under firewall, the port nos 2048-3251 required to be open for login. Please ask your Network Admin/ISPs.

Login Help Manual

LOGIN

[HOME](#)[ABOUT](#)[BENEFICIARY INSTITUTIONS](#)[Reach Us : pds.help\[at\]inflibnet.ac.in](#)

shodhgeya → There's  
gangotri → synopsis  
sindhu → journals/resource  
sardar → plagiarism

[SEARCH](#)[FAQs](#)[ShodhShuddhi-University Coordinator Login](#)

## About

[Home / About](#)

### About ShodhShuddhi

Based on the recommendation of Sub-Committee, National Steering Committee (NSC) of e-ShodhSindhu, The Ministry of Education, Govt. of India has initiated a programme "ShodhShuddhi" which provides access to Plagiarism Detection Software (PDS) to all Universities/Institutions in India since Sept 1, 2019. 1100+ institutions are identified which includes

- Central Universities
- State Universities
- Deemed to be University
- Private Universities
- Centrally funded Technical Institutions (CFIs)
- Inter-University Centre (IUCs) of UGC

Under the ShodhShuddhi initiative, Universities and Institutions across the country were provided access to Ouriginal (formerly Urkund), a web-based plagiarism detection software system. This initiative was officially inaugurated by the Former Minister of Education (formerly MHRD) on September 21, 2019, and it continued until the contract with M/s Ouriginal by Turnitin concluded on September 30, 2023. Starting from October 1, 2023, the INFLIBNET Centre now offers the 'DrillBit-Extreme Plagiarism Detection Software' to Higher Education Institutions (HEIs) as part of the same ShodhShuddhi initiative. The trial phase for this software was scheduled for October 2023, with full-



# ShodhShuddhi

- ShodhShuddhi initiative provided access to Ouriginal (formerly Urkund) plagiarism detection software from September 21, 2019, to September 30, 2023.
- INFLIBNET Centre replaced Ouriginal with 'DrillBit-Extreme Plagiarism Detection Software' starting October 1, 2023.
- Trial phase for DrillBit-Extreme scheduled for October 2023; full service began on November 1, 2023.  
~~DrillBit-Extreme~~



- **E-KALPA:** Online platform for architecture students.
  - Established: Developed by collaboratively developed by the three institutions - IDC at IIT Bombay, NID at Bangalore, and DOD at IIT Guwahati
 

*Industrial Design Centre*
*Dept of Design*
- **E-YANTRA:** Hands-on robotics training initiative. - NMEICT
  - Established: Developed by IIT Bombay in 2002.
 

*Dr. Kavita Singh*
*4.0*
- **E-GRANTHALAYA:** e-Granthalaya is an Integrated Library Management Software developed by NIC for Automation and Networking of Government Libraries. – 2002
  - *National Information Centre*
- **INFLIBNET:** Inter-University Centre for electronic resources sharing.
  - Established: Developed by UGC in 1991
 

*UGC*
*1991*
*Info Lib Network*
- **E-ACHARYA:** Online learning platform for teachers. – NMEICT
  - MAINTAINED BY INFILBNET
 

*Integrated*
*e-content portal*

Swayo



Unify Study  
United Information for You

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**UGC NET/SET COMPLETE COURSE JUNE 2024**

# ICT

IIT(M), Google Plagiarism System



Unify Study  
Unified Information for You

SWAYAM ✓	Study Webs of Active-Learning for Young Aspiring Minds - MOOC	2017, 4 QUADRANTS, ANU CNN IIN (12) - PM (evidya)
SWAYAM PRABHA ✓	DTH, GSAT-15 - INFLIBNET - BISAG - GUJARAT- 24/7, 5 TIMES - 4HRS/DAY ,	2017 , HE-40, SE-200,CE- 40 UGC,IIT,CEC, IGNOU,UOH Sathree
NDL- NATIONAL DIGITAL LIBRARY ✓	Access e-content on multiple disciplines IIT KHARAGPUR	2016, Jst 2015
E-VIDWAN ✓	EXPERT DATABASE University Expert Database (1999)+ Expert Database in Science and Technology ( 2001) = E-VIDWAN	(2012)
NAD - NATIONAL ACADEMIC REPOSITORY → digital locker	digital issuance, storage, access and verification of Academic Awards	2017 NAD - stored data Digital locker - fetch the data from NAD
FOSSEE	Free/Libre and Open Source Software for Education IIT BOMBAY	2017 2009
VIRTUAL LAB ✓	remote access to Laboratories in various disciplines of Science and Engineering IIT Delhi - 11 paths -	?
SHODHGANGA ✓	SOFT COPIES OF PHD THESIS	2009
SHODH SUDHI ✓ @	PLAGARISM DECTECTION SOFTWARE Ouriginal	2019 2023 - Drillbit Extreme
SHODHGANGOTRI ✓	synopsis of research topic submitted to the universities	
SHODH SINDHU ✓	e-ShodhSindhu was formed with merger of three consortia, namely UGC-INFONET Digital Library Consortium, NLIST and INDEST-AICTE Consortium – JOURNALS	2015



E-KALPA ✓	Creating Digital-learning Environment for Design (DSOURCE IIT Bombay, IIT Madras, NID Bangalore)	2015
E-YANTRA ✓	incorporate Robotics into engineering education – IIT BOMBAY	2002
E-GRANTALAYA ✓	transform traditional libraries to e-Library with Digital Library Services	4.0
INFLIBNET ✓	Information and Library Network - modernizing university libraries	1991, IUC-1996



## Number Conversions

Binary → 0, 1

Base  
2

Decimal → 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 → 10

Octal → 0, 1, 2, 3, 4, 5, 6, 7 → 8

Hexa → 0 - 9, A, B, C, D, E, F       $(0-15)$   
 $\underline{(16)}$  → 16  
 $(0-15)$



① Decimal to Binary:

$(10)_{10}$  → Decimal

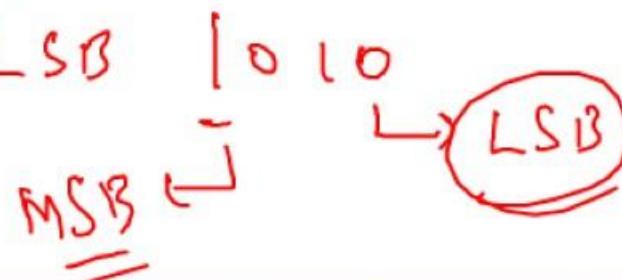
$(10)_2$  → Binary

$(10)_8$  → Octal

$(10)_{16}$  → Hexa.

MSB

LSB



①  $(10)_{10} \rightarrow \text{Binary.}$

$$\begin{array}{r} 2 | 10 \\ 2 | 5 - 0 \\ 2 | 2 - 1 \\ \hline & 1 - 0 \end{array}$$

$$(10)_{10} = (1010)_2$$

even

$(11)_{10}$

$$\begin{array}{r} 2 | 11 \\ 2 | 5 - 1 \\ 2 | 2 - 1 \\ \hline & 1 - 0 \end{array}$$

$$(11)_2 = (1011)_2$$

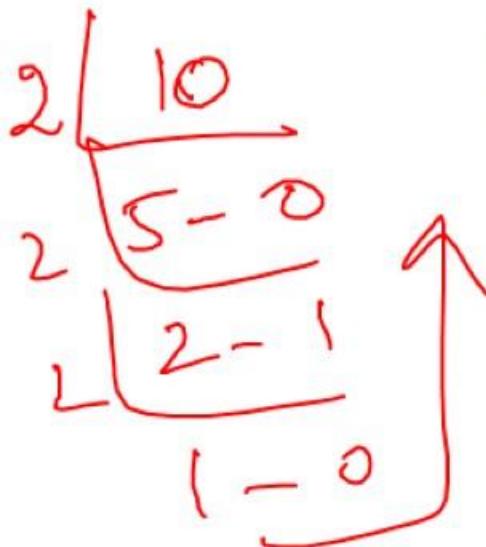


$(10.25)_{10} \rightarrow \text{Binary}$

$$.25 \times 2 = 0.50$$

1010

$$.50 \times 2 = 1.00$$



$(1010.01)_2$

$$\begin{array}{r}
 (10.625) \\
 1010 \\
 \times 2 \\
 \hline
 1010 \\
 \end{array}$$

$625 \times 2 = 1.250$   
 $.250 \times 2 = 0.500$   
 $.500 \times 2 = 1.000$

$(1010.101)_2$



Binary to Decimal

$$(1010)_2 = (?)_{10}$$

$$\begin{array}{r}
 1010 \\
 | \quad | \\
 0 \times 2^0 = 0 \\
 1 \times 2^1 = 2 \\
 0 \times 2^2 = \\
 1 \times 2^3 = 8 \\
 \hline
 \end{array}$$

$$2^0 = 1$$

$$(1011)_2 = (?)_{10}$$

1011	$1 \times 2^0 = 1$ $1 \times 2^1 = 2$ $0 \times 2^2 = 0$ $1 \times 2^3 = 8$	$1 \times 2^0 = 1$ $1 \times 2^1 = 2$ $0 \times 2^2 = 0$ $1 \times 2^3 = 8$	$1011$ $256 \ 128 \ 64 \ 32 \ 16 \ 8 \ 4 \ 2 \ 1$
------	--	--	--

$$\begin{array}{r}
 (1011)_2 = (?)_{10} \\
 256 \ 128 \ 64 \ 32 \ 16 \ 8 \ 4 \ 2 \ 1 \\
 1 \times 2^0 = 1 \\
 1 \times 2^1 = 2 \\
 0 \times 2^2 = 0 \\
 1 \times 2^3 = 8 \\
 \hline
 11
 \end{array}$$



Binary to Decimal point

$$(11001 \cdot 101)_2 \rightarrow (?)_{10}$$

11001

$$\begin{array}{r} \cdot 101 \\ 16 \cdot 8 + 1 \\ (25) \end{array}$$

$$\begin{aligned} &= 1 \times 2^0 + 0 \times 2^1 + 1 \times 2^2 \\ &\quad + 1 \times \frac{1}{2} + 0 + \frac{1}{8} \end{aligned}$$

$$1 \times 0.5 + 0 \quad 1 \times 0 \cdot 125$$

$$0.5 + 0.125$$

$$= 0.625$$

$$8 \overline{)1.0} \quad .125$$

$$\begin{array}{r} 8 \\ \hline 20 \end{array}$$

$$\begin{array}{r} 16 \\ \hline 40 \end{array}$$

Dec  $\rightarrow$  Bin

Bin  $\rightarrow$  Dec

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Dec  $\rightarrow$  hexa

0-9, A-F

Hexa  $\rightarrow$  Deci

$$(AF)_{16} \rightarrow (?)_{10}$$

$$(175)_{10} = ?(AF)_{16}$$

$$\begin{array}{r} 175 \\ 16 \longdiv{175} \\ \quad 10 - 15 \\ \quad \quad \quad \swarrow \\ \quad \quad \quad AF \end{array}$$

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$$\begin{array}{r} AF \\ | \\ 15 \\ | \\ 10 \times 16^1 = 160 \\ \hline 175 \end{array}$$

$$15 \times 16^0 = 15$$

Dec  $\rightarrow$  Oct

$$(10)_{10} \rightarrow (?)_8 \Rightarrow (12)_8$$

$$\begin{array}{r} 10 \\ 8 \longdiv{10} \\ \underline{8} \quad 2 \\ 1 \quad 2 \end{array}$$

$$(10)_{10} \rightarrow (12)_8 =$$

Oct  $\rightarrow$  Dec

$$(12)_8 \rightarrow (?)_{10} \Rightarrow (10)_{10}$$

$$\begin{array}{r} 12 \\ 2 \times 8^0 = 2 \\ 1 \times 8^1 - \underline{8} \\ \hline 10 \end{array}$$

Binary to Octal

$$(10)_{10} \Rightarrow (1010)_2 \Rightarrow (Octal)_{12}_8$$

$$\begin{array}{r} (00)(010) \\ 2 \quad 2 \quad 2 \quad 2 \quad 2 \quad 2 \end{array}$$

$$(12)_8 =$$



Dec  $\rightarrow$  Binary to Octal

$$(64)_{10} \rightarrow \begin{array}{r} 2 | 64 \\ 2 | 32 - 0 \\ 2 | 16 - 0 \\ 2 | 8 - 0 \\ 2 | 4 - 0 \\ 2 | 2 - 0 \\ 1 - 0 \end{array}$$

$$8 | 64 \\ 8 | 8 - 0 \\ 8 | 1 - 0$$

$(0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0) \rightarrow \text{Oct}$

$2^6 \ 2^5 \ 2^4 \ 2^3 \ 2^2 \ 2^1 \ 2^0$

$(00)(0 \ 00)(000)$

$(1 \ 0 \ 0)_8$



Dec  $\rightarrow$  Binary  $\rightarrow$  Stem

$$(10)_{10} \quad (1010)_2 \rightarrow \begin{array}{c} (1010) \\ (10) \\ \downarrow \\ (A)_{16} \end{array}$$

$$\begin{array}{c} (0001\ 1101\ 011001\ 10) \\ \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \\ 1 \ 6 \ 5 \ 4 \ 6 \end{array}$$

$$(16546)_8$$

Binary to Stem

$$\begin{array}{c} (0001\ 1101\ 011001\ 10) \\ \hline \hline \end{array}$$

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$$\begin{array}{c} 8421, 8421 \\ 13 \\ D \\ 6 \\ 6 \end{array}$$

$$SD6b$$



**Session 3- ICT  
02-04-2024**

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KARATHI



“

Everyone who remembers his own education remembers teachers, not methods and techniques. The teacher is the heart of the educational system.

SIDNEY HOOK

Southern Living



Match List I with List II:

List I	List II
(E-initiatives)	(Descriptions)
(a) Vidwan	(i) Repository for full-text thesis, e-books and journals
(b) Digilocker	(ii) Education portal to facilitate learning
(c) Sakshat	(iii) Database of leading scientists researchers
(d) Shodh Ganga	(iv) Platform for issuance and verification of documents and certificates

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**Choose the correct answer from the options given below:**

- 1.(a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)
- 2.(a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
- 3.(a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)
- 4.(a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)



Match List I with List II:

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ULASI BHARATHI

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- 3.(a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)
- 4.(a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)



When was Digital India programme started? →

- 1.2013
- 2.2014
- 3.2015
- 4.2016

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**When was Digital India programme started?**

- 1.2013
- 2.2014
- 3.2015**
- 4.2016

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Which of the following terms is related to the digital learning environment for design?

- 1.e-Vidwan → databases of Prof
- 2.e-Acharya → integrated content
- 3.e-Kalpa → 3 IDC
- 4.e-Yantra → NID
- Robotics → DDo, IIT Guwahati



Which of the following terms is related to the digital learning environment for design?

- 1.e-Vidwan
- 2.e-Acharya
- 3.e-Kalpa
- 4.e-Yantra

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List I (Digital Initiative s in HE)		List II (Purpose)
A NAD	1	Reduce dependency on proprietary software in educational institutions.
B NDL	2	Learn various free and open-source software all by oneself.
C Spoken Tutorial	3	Issuance, storage, access and verification of Academic of Academic Awards namely degrees, mark-sheets etc.
D FOSSEE	4	framework of virtual repository of learning resources with a single-window search facility.

Match List I with List II  
 Choose the correct answer from the options given below:

- 1.A - 3, B - 4, C - 2, D - 1  
 2.A - 4, B - 3, C - 1, D - 2  
 3.A - 4, B - 3, C - 2, D - 1  
 4.A - 2, B - 1, C - 3, D - 4



	<b>List I (Digital Initiative s in HE)</b>		<b>List II (Purpose)</b>
A	NAD	1	Reduce dependency on proprietary software in educational institutions.
B	NDL	2	Learn various free and open-source software all by oneself.
C	Spoken Tutorial	3	Issuance, storage, access and verification of Academic of Academic Awards namely degrees, mark-sheets etc.
D	FOSSEE	4	framework of virtual repository of learning resources with a single-window search facility.

**Match List I with List II**  
Choose the correct answer from the options given below:

- 1.A - 3, B - 4, C - 2, D - 1  
 2.A - 4, B - 3, C - 1, D - 2  
 3.A - 4, B - 3, C - 2, D - 1  
 4.A - 2, B - 1, C - 3, D - 4



List I (Digital Initiative)	List II (Objective)
a) NAD	i) Utilization of satellite communication technologies for transmission of education e-contents through <u>National</u> channels
b) SWAYAM PRABHA	ii) All-digital library that stores information (metadata) about different types of digital contents.
c) NDL	iii) <u>24 × 7</u> online store house of all academic awards viz. <u>certificates, degrees</u> etc.
d) SWAYAM	iv) Offers various online courses for school education and higher education.

1. a-ii, b-i, c-iii, d-iv
2. a-iii, b-i, c-ii, d-iv
3. a-iii, b-iv, c-ii, d-i
4. a-iv, b-i, c-ii, d-iii



<b>List I (Digital Initiative)</b>		<b>List II (Objective)</b>	
a)	NAD	i)	Utilization of satellite communication technologies for transmission of education e-contents through National channels
b)	SWAYAM PRABHA	ii)	All-digital library that stores information (metadata) about different types of digital contents.
c)	NDL	iii)	24 × 7 online store house of all academic awards viz. certificates, degrees etc.
d)	SWAYAM	iv)	Offers various online courses for school education and higher education.

1. a-ii, b-i, c-iii, d-iv
2. a-iii, b-i, c-ii, d-iv
3. a-iii, b-iv, c-ii, d-i
4. a-iv, b-i, c-ii, d-iii



**With reference to SWAYAM, which of the statements A-C given below are correct?**

- A. The current SWAYAM platform is developed by Ministry of Education and NPTEL, IIT Madras, with the help Google Inc. and Persistent systems Ltd.
- B. It facilitates hosting of all the courses, taught in the classrooms from class 9<sup>th</sup> till Post Graduation.
- C. Courses and Certificates provided through SWAYAM are available free of cost to the learners.

**Choose the correct answer from the options given below**

- (a) A and B only
- (b) A and C only
- (c) B and C only
- (d) A, B and C



With reference to SWAYAM, which of the statements A-C given below are correct?

- A. The current SWAYAM platform is developed by Ministry of Education and NPTEL, IIT Madras, with the help Google Inc. and Persistent systems Ltd.
- B. It facilitates hosting of all the courses, taught in the classrooms from class 9<sup>th</sup> till Post Graduation. *ANU CNN IS&T*
- C. Courses and Certificates provided through SWAYAM are available free of cost to the learners.

Choose the correct answer from the options given below

- (a) A and B only
- (b) A and C only
- (c) B and C only
- (d) A, B and C



Gmail

NPTEL EXAM

Active



99+

Compose

Mail

1

Inbox

6,719

Chat

Starred

Snoozed

Sent

Drafts

36

More

Labels

+



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**Given below are two statements:**

**Statement I:** SWAYAM initiative is a significant step towards providing financial and technical assistance to young start-up entrepreneurs.

**Statement II:** The tagline of Digilocker logo says "My Documents, Anytime, Anywhere".

**In light of the above statements, choose the most appropriate answer from the options given below:**

1. Both Statement I and Statement II are correct.
2. Both Statement I and Statement II are incorrect.
3. Statement I is correct but Statement II is incorrect.
4. Statement I is incorrect but Statement II is correct



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Match List I with List II:

**List 1. (Digital Initiative)**

A. e-Vidwan

B. e-Kalpa

C. e-Yantra

D. e-Sodh Sindhu

**List 2. (Objective)**

1. Digital-learning environment for design

2. Subscription-based scholarly information  
(e-books and e-journals) at lower rates

3. Expert Database and National Research Network

4. Spread education in Embedded systems and Robotics

Choose the correct answer from the options given below:

1. A-3

B-4

C-1

D-2

2. A-2

B-1

C-4

D-3

~~3. A-3~~

B-1

C-4

D-2

4. A-1

B-3

C-4

D-2



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D-3

**3. A-3**

**B-1**

**C-4**

**D-2**

4. A-1

B-3

C-4

D-2



Identify the correct ascending order of the following numbers under A-D represented in different bases:

- (235) (A)  $(11101011)_2$  : (Base - 2 binary number)
- (372) (B)  $(564)_8$  (Base - 8 Octal number) - 372
- (614) (C)  $(614)_{10}$  (Base - 10 decimal number)
- (1161) (D)  $(489)_{16}$  (Base - 16 hexadecimal number)

$$\begin{array}{r} 1 \ 1 \ 1 \ 0 \ 1 \ 0 \ 1 \ 1 \\ 2 \ 2 \ 2 \ 2 \ 2 \ 2 \ 2 \ 2 \\ \hline 1 \ 0 \ 1 \ 1 \end{array}$$

$$1 + 2 + 8 + 32 + 64 + 128$$

$$\begin{array}{r} (235) \\ (372) \\ (614) \\ \hline 1 \ 0 \end{array}$$

$$\begin{array}{r} 4 \times 8^0 = 4 \\ 6 \times 8^1 = 48 \\ 5 \times 8^2 = 320 \\ \hline 372 \end{array}$$

Choose the correct answer from the options given below:

1. A,C,D,B
2. D,C, B,A
3. B,C,A,D
4. A,B,C,D

$$\begin{array}{r} (489)_{16} \\ \hline 1 \ 0 \ 2 \ 9 \end{array}$$

$$\begin{array}{r} 9 \times 16^0 = 9 \\ 8 \times 16^1 = 128 \\ 4 \times 16^2 = 256 \\ \hline 4029 \end{array}$$

$$\begin{array}{r} 256 \\ 4 \\ \hline 1024 \\ 9 \end{array}$$



Identify the correct ascending order of the following numbers under A-D represented in different bases:

- (A)  $(11101011)_2$  : (Base - 2 binary number)
- (B)  $(564)_8$  (Base - 8 Octal number)
- (C)  $(6\overset{1}{1}4)_{10}$  (Base - 10 decimal number)
- (D)  $(489)_{16}$  (Base - 16 hexadecimal number)

Choose the correct answer from the options given below:

1. A,C,D,B
2. D,C, B,A
3. B,C,A,D
4. **A,B,C,D**



What is the binary equivalent of the decimal number 85.125?

1. ~~(1001001.111)~~

3. ~~(1100101.001)~~

2. ~~(1010101.101)~~

4. ~~(1010101.001)~~

$$\begin{array}{r}
 2 | 85 \\
 2 | 42 - 1 \\
 2 | 21 - 0 \\
 2 | 10 - 1 \\
 2 | 5 - 0 \\
 2 | 2 - 1 \\
 \quad\quad\quad 1 - 0
 \end{array}$$

$$\begin{aligned}
 & \cdot 125 \times 2 = 0.250 \\
 & \cdot 250 \times 2 = 0.500 \\
 & \cdot 500 \times 2 = 1.000
 \end{aligned}$$

$$\begin{aligned}
 & 1 \times \frac{1}{2} = \frac{1}{2} \\
 & 0.5 + 0.125 = 0.625 \\
 & 1 \times \frac{1}{2} = \frac{1}{2} \\
 & 0.125 \times 2 = 0.250 \\
 & 1 \times \frac{1}{2} = \frac{1}{2} \\
 & 0.250 \times 2 = 0.500 \\
 & 1 \times \frac{1}{2} = \frac{1}{2} \\
 & 0.500 \times 2 = 1.000
 \end{aligned}$$



Given below are two statements with refers to number systems

**STATEMENT 1 :**  $(0.6875)_{10} = (0.1011)_2$  ✓  $(0.101)_2$

**STATEMENT 2 :**  $(111011.101)_2 = (58.625)_{10}$

- a) S<sub>1</sub> & S<sub>2</sub> are true
- b) S<sub>1</sub> & S<sub>2</sub> are false
- c) S<sub>1</sub> - T ; S<sub>2</sub> F
- d) S<sub>1</sub> - F S<sub>2</sub> - T

$$\begin{aligned} S_1 \\ 0.6875 \times 2 &= 1.3750 \\ 0.3750 \times 2 &= 0.7500 \\ 0.7500 \times 2 &= 1.5000 \end{aligned}$$

$$0.5000 \times 2 = \underline{\underline{1.0000}}$$

$$\begin{array}{r} S_2 \\ 111011 \\ \times 2^3 \\ \hline 52168 \\ \hline 21 \end{array}$$

(59)



Given below are two statements with refers to number systems

**STATEMENT 1 :**  $(0.5625)_{10} = (0.9)_{16}$  → **True.**

**STATEMENT 2 :**  $(0.3)_{10} = (0.4\overline{BBB})_{16}$  → **False**

- 2) S1 T - True
- 5) S1 S2 False
- C) S1-T - S2-F
- 1) S1 F - S2 -T.

1) Number System

2) Memory Storage

3) Excel

$$\begin{aligned} 0.3 \times 16 &= 4.8 \\ 0.8 \times 16 &= 12.8 \\ 0.8 \times 16 &= 12.8 \end{aligned}$$

$$\begin{array}{r} 16 \\ \underline{\times} 8 \\ 128 \end{array}$$

B A(B)C  
10 11 12



Given below are two statements with refers to number systems

**STATEMENT 1 :**  $(\cancel{1}011101)_2 = (5D)_{16}$

**STATEMENT 2 :**  $(C2)_{16} = (\cancel{1}1000010)_2$

a) S1  $\wedge$  S2 - True  $\frac{194}{232^2} \frac{2}{2}$

b) S1  $\wedge$  S2 - False  $\frac{194}{(8)16}$

c) S1 - T; S2 F

d) S1 - F; S2 - T

$$\begin{array}{rcl} 5D & \rightarrow & 1011101 \\ 13 \times 16^0 : 13 & & \\ 52 \times 16^1 = 80 & \rightarrow & 64 1684 \\ & & (93) \\ & & (93) \end{array}$$

$$(C2)_{16}$$

$$\begin{array}{rcl} 2 \times 16^0 : 2 \\ 12 \times 16^1 . \frac{192}{192} \\ \hline 194 \end{array}$$

$$\begin{array}{rcl} 0101 | 1101 \\ 5 \quad \quad \quad 13 \\ \hline \end{array}$$

$$(C2)_{16}$$

$$(5D)$$

$$\begin{array}{rcl} 16 \\ 12 \quad 2 \\ \hline 3 \quad 16 \\ \hline \end{array}$$



Given below are two statements with refers to number systems

**STATEMENT 1 :**  $(499)_{10} = (111110011)_2$

**STATEMENT 2 :**  $(1011101)_2 = (93)_{10}$

STU

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Given below are two statements with refers to number systems

**STATEMENT 1 :**  $(21E)_{16} = (541)_{10}$   $\rightarrow$  False

**STATEMENT 2 :**  $(257)_{10} = (101)_{16}$   $\rightarrow$  True

$$(21E)_{16}$$

$$\hookrightarrow 14 \times 16^0 = 14$$

$$\hookrightarrow 1 \times 16^1 + 14 \times 16^0 = 16 + 14 = 30$$

$$2 \times 16^2 = 512$$

$$\frac{256}{512} \quad \text{Quotient: } 0 \\ \text{Remainder: } 256$$

$$16 \overline{)257}$$

$$16 \overline{)16 - 1}$$

$$\boxed{542}$$

S1  $\rightarrow$  False  
S2  $\rightarrow$  True.



If  $(P)_8$  represents the number P in base -8 then  $(144)_8 + (175)_8$

- $\Rightarrow$  a)  $(25)_8$  b)  $(41)_8$  c)  $(41)_8$  d)  $\overline{(34)}_8$

$$(144)_8$$

$$+ (175)_8$$

144

$$\begin{array}{r} 4 \times 8^0 = 14 \\ 4 \times 8^1 = 32 \\ 1 \times 8^2 = 64 \\ \hline (100)_{10} \end{array}$$

$$\begin{array}{r} 225 \\ 28-1 \\ \hline 3-4 \end{array}$$

175

$$\begin{array}{r} 5 \times 8^0 = 5 \\ 7 \times 8^1 = 56 \\ 1 \times 8^2 = 64 \\ \hline (125)_{10} \end{array}$$

$$(225)_{10} = (341)_8$$



Given below are two statements with refers to number systems

**STATEMENT 1 :**  $(1011101)_2 = (135)_8$

**STATEMENT 2 :**  $(71)_8 = (111001)_2$

⑦ Problem

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Given below are two statements with refers to number systems

**STATEMENT 1 :**  $(167)_{10} = (101000111)_2$

**STATEMENT 2 :**  $(11010110)_2 = (214)_{10}$

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Given below are two statements with refers to number systems

**STATEMENT 1 :**  $(49)_{10} = (31)_{16} = (00110001)_2$

**STATEMENT 2 :**  $(7B)_{16} = (123)_{10} = (011111011)_2$

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- Given below are two statements with refers to number systems
- Statement I :**  $(11001000) = (CB)_{10} = (200)_{10}$
- Statement II :**  $(123)_{10} = (01111011)_2 = (7B)_{10}$

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- Given below are two statements with refers to number systems
- Statement I :**  $(D6C1)_{10} = (54977)_{10}$
- Statement II :**  $(41819)_{10} = (A35B)_{10}$

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Given below are two statements

**Statement I:**  $(4A2F)_{16} = (18991)_{10}$

**Statement II:**  $(6940)_{10} = (1B1C)_{16}$

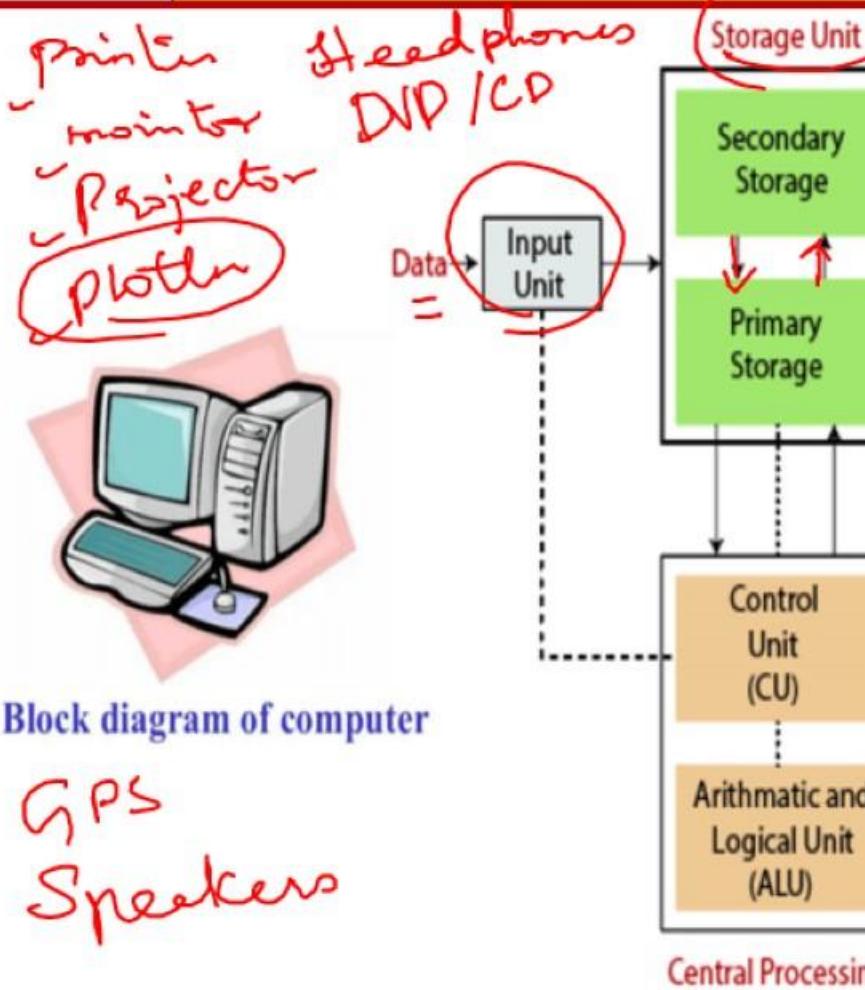
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Basic Concepts of Computer → <sup>Memory</sup> ~~Computer~~

**SESSION 4**  
**04-04-2024**

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Block diagram of computer

GPS  
Speakers

The computer system consists of three main parts:

Input Units, CPU, and Output Units

### 1. The major functions of the Input Unit are-

- The Input Unit takes the data to be processed by the user.
- The data is then converted into machine-readable form.
- The Input Unit then transmits the converted data into the main memory of the computer.
- The main purpose of this process is to connect the user and the computer by creating an easy connection between them.

### 2. Output unit presents processed data to the user.

- Examples include printers, monitors, projectors.
- Presents data as soft copy (on screen) or hard copy (on paper).
- Receives binary data from computer, converts it into readable format.
- Accepts data from main memory.
- Converts binary data into human-readable form.

Keyboard  
mouse  
touch screen  
light pen  
mic  
joystick  
Scanner  
Camera  
Sensors



① Pointers → Dot Matrix  
→ Daisy Wheel Printer }  
→ Line printer }  
→ chain Printer } Impact Printer.

Non Impact Printers  
↳ Laser printer  
Inkjet printer



impact printers



non impact printer





### 3. CPU Functions:

- Acts as computer's brain, managing tasks and operations.
- Controls components, software, and data processing.
- **Registers:** Small, high-speed storage locations within the CPU used to temporarily hold data and instructions.
- **Cache Memory:** High-speed memory used to store frequently accessed data and instructions, providing quick access for the CPU.
- **Clock:** Generates timing signals to synchronize operations within the CPU and other components of the computer system.

### ALU (Arithmetic Logic Unit) Functions:

- Performs arithmetic and logical operations.
- Handles addition, subtraction, AND, OR, etc.

### CU (Control Unit):

- Coordinates tasks and operations.
- Converts instructions into control signals.

### Memory Units:

#### • Primary Memory (e.g., RAM):

- Stores temporary data.
- Directly accessible by CPU for reading and writing.

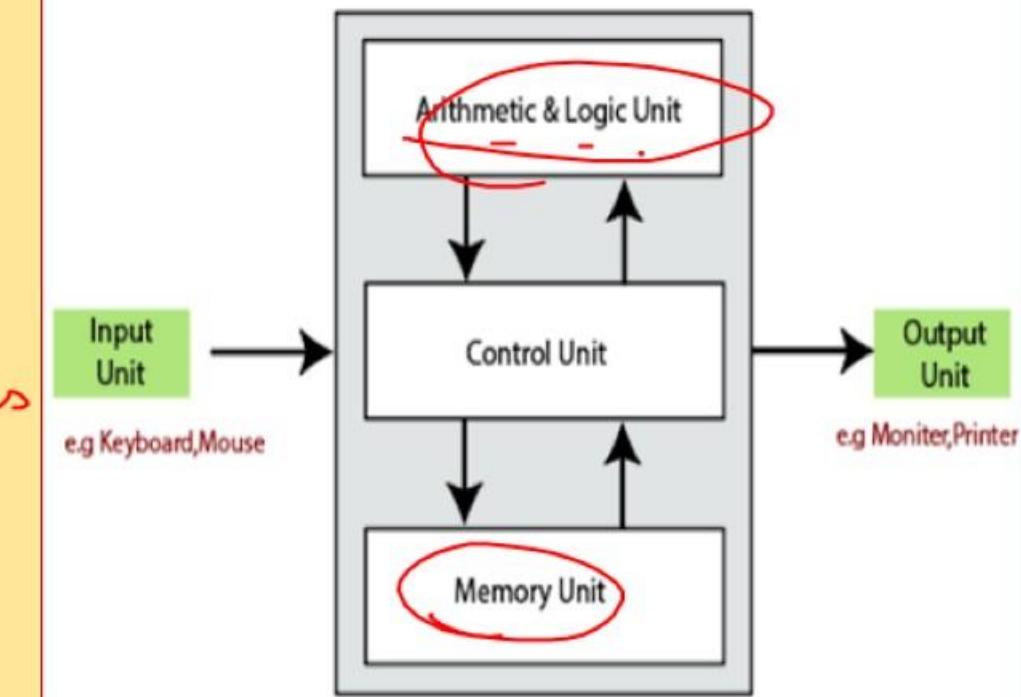
#### • Secondary Memory (e.g., hard disk):

- Stores permanent data.
- Data persists even during power failure.

2019

*Quick Access*  
*Buses - Collection of wires*

### Central Processing Unit (CPU)

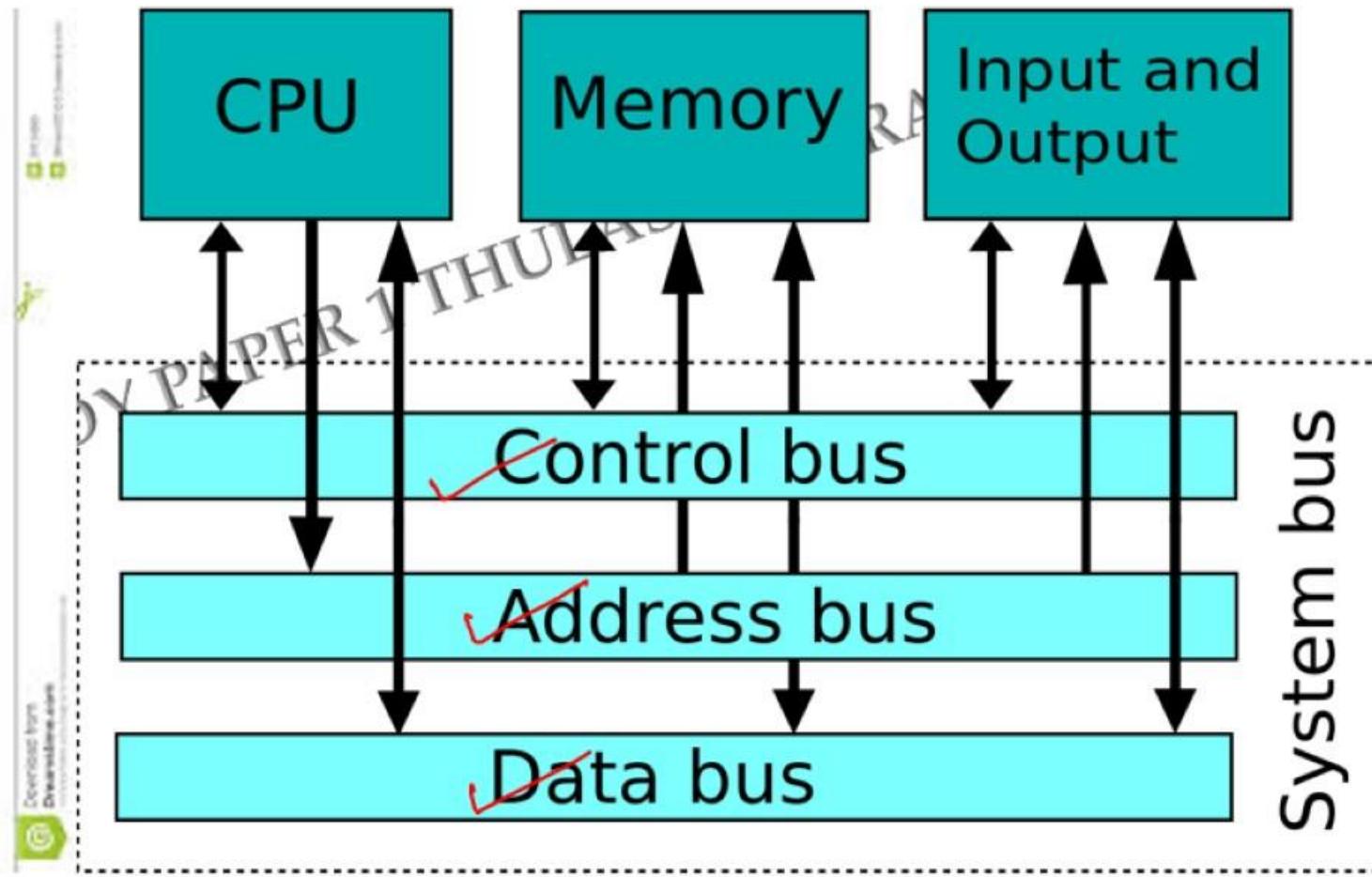


Bus

peripherals



address - unidirectional → up to memory  
data → bidirectional





# 5 Generations of Computers

<b>Generations</b>	<b>Time-Period</b>	<b>Technology Used</b>
✓ <b>1st Generation</b>	1940s – 1950s	Vacuum Tube Based
✓ <b>2nd Generation</b>	1950s – 1960s	Transistor Based
✓ <b>3rd Generation</b>	1960s – 1970s	Integrated Circuit Based
✓ <b>4th Generation</b>	1970s – Present	Microprocessor Based
✓ <b>5th Generation</b>	Present – Future	Artificial Intelligence Based

First Generation (1940 to 1956)

Second Generation (1956 to 1964)

Third Generation (1964 to 1971)

Fourth Generation (1971 to present)

Fifth Generation (Present & beyond)





VT

T

IC  
1.6 GHz Freq  
1.6 Gb/s

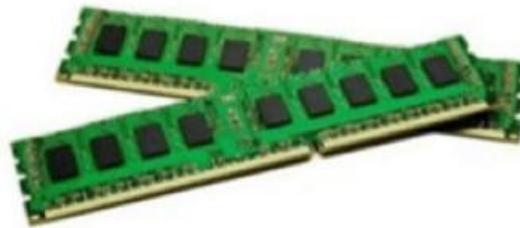
VLSIC

## Generation of Computer

Subject	1 <sup>st</sup> generation	2 <sup>nd</sup> generation	3 <sup>rd</sup> generation	4 <sup>th</sup> generation	5 <sup>th</sup> generation <sup>2020</sup>
Period	1940-1956	1956-1963	1964-1971	1971-present	present & beyond
Circuitry	Vacuum tube — —	Transistor — —	Integrated chips (IC) — —	Microprocessor — (VLSI) — —	ULSI (Ultra Large Scale Integration) technology
Memory Capacity	20 KB	128KB	1MB	Semiconductor type and very high	VLSI and ULSI
Processing Speed	300 IPS inst. Per sec.	300 IPS	1MIPS(1 million inst. Per sec.)	Faster than 3 <sup>rd</sup> generation	Very fast
Programming Language	Assembly Language	High level language (FORTRAN, COBOL, ALGOL)	C,C++ —	C,C++,Java	All the Higher level languages, Neural networks,
Example of computers	UNIVAC, EDVAC	IBM 1401, IBM 7094, CDC 3600,D UNIVAC 1108	IBM 360 series, 1900 series	Pentium series Multimedia, Stimulation	Artificial Intelligence, Robotics



## INTERNAL MEMORY



RANDOM ACCESS MEMORY



READ ONLY MEMORY

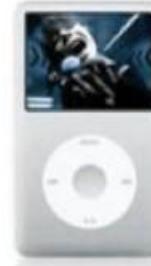
## EXTERNAL MEMORY



Memory Card Reader



USB Flash Memory



Media Devices



External Optical Drives



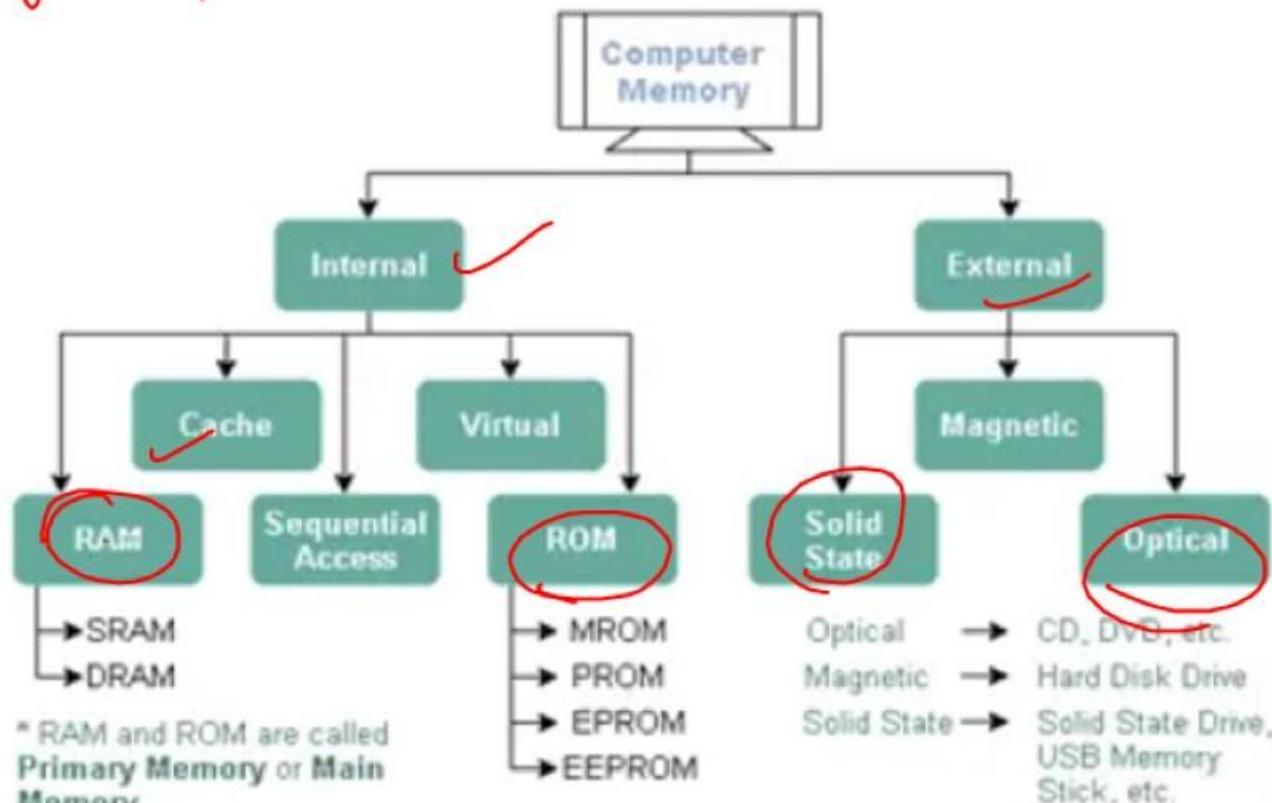
ZIP Drive

# Computer Memory And Its Types



Computer memory is essential for storing and retrieving data and instructions necessary for executing tasks on a computer system. It consists of memory cells, each with a unique address, forming the building blocks of memory. The CPU accesses these memory cells to read or write data. Memory is crucial for the performance of a computer system, as the CPU can only store basic instructions. A computer's ability to handle large sets of data and execute tasks efficiently depends on its memory capacity and performance.

*Modern of Computer Architecture Von Neumann*

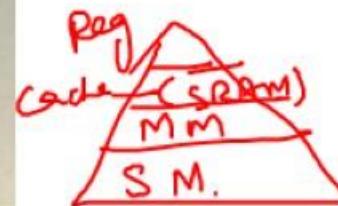




## Internal Memory

Internal Memory refers to the chips or modules that are directly connected to the motherboard

- RAM (Random Access Memory) is the internal memory of the CPU.
- Also known as read-write memory.
- Primary volatile memory, data is lost on power off.
- Smaller and faster than other computer memories.
- Not as fast as registers.



RAM can further be divided into the following categories-

SRAM: Static Random Access Memory or SRAM stores the data in a static form, meaning the data remains in the memory for as long as the computer is on. SRAM uses a matrix of six transistors and no capacitors.

Transistors do not need the power to prevent leakage hence, we do not need to refresh SRAM again and again.

DRAM: Dynamic Random Access Memory is widely used in computer systems.

Earlier, there was a single data rate (SDR) used in computers but now, a dual data rate (DDR) is used in them. DDR is also available in different versions such as DDR2, DDR3 and DDR4 which are more energy efficient and provide better performance. DRAM is made up of a transistor and a capacitor in each cell because of which it has a leakage problem. Hence, we need to refresh a DRAM again and again.

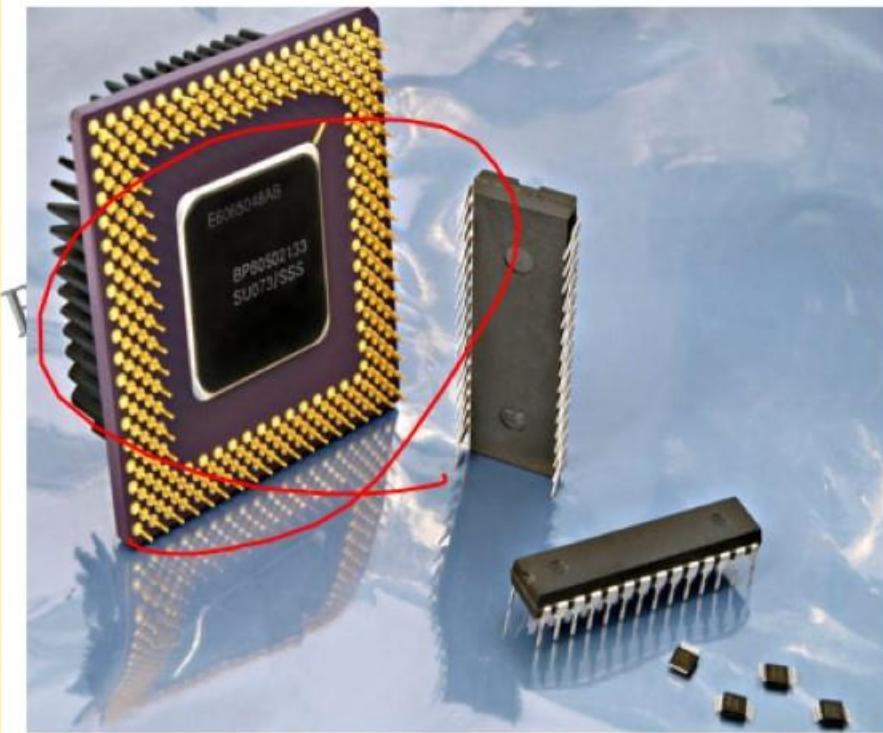
ROM stands for Read Only Memory into which the data cannot be normally written.

While the data can easily be read from this type of memory.

ROM is a primary non-volatile memory, meaning it can retain all the data in the memory without the power supply.

It is a very fast computer memory that stores the instructions required to start the computer as soon as we connect it to the power source.

When we connect the computer to the power source, the CPU starts reading the instructions stored in ROM. It also does not require support from the driver or any complex software to load the necessary parts of the operating system in the primary memory.





Booting → process of starting a computer

Cold Boot → normal working of switching on the power button  
(hard)

Warm Boot → Restart ~~the~~  
(soft Boot) computer

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### 1. MROM (Masked Read Only Memory):

Contents pre-programmed by the manufacturer.

Data cannot be changed by users.

Altering data is difficult or slow due to manufacturing process.

### 2. PROM (Programmable Read Only Memory):

User-programmable memory.

Manufactured as blank memory.

Programmed using PROM programmer.

Once programmed, data cannot be changed.

### 3. EPROM (Erasable Programmable Read Only Memory):

Upgraded version of PROM.

Allows erasing and rewriting of data.

Data erased by exposing to ultraviolet light.

Data can be reprogrammed multiple times.

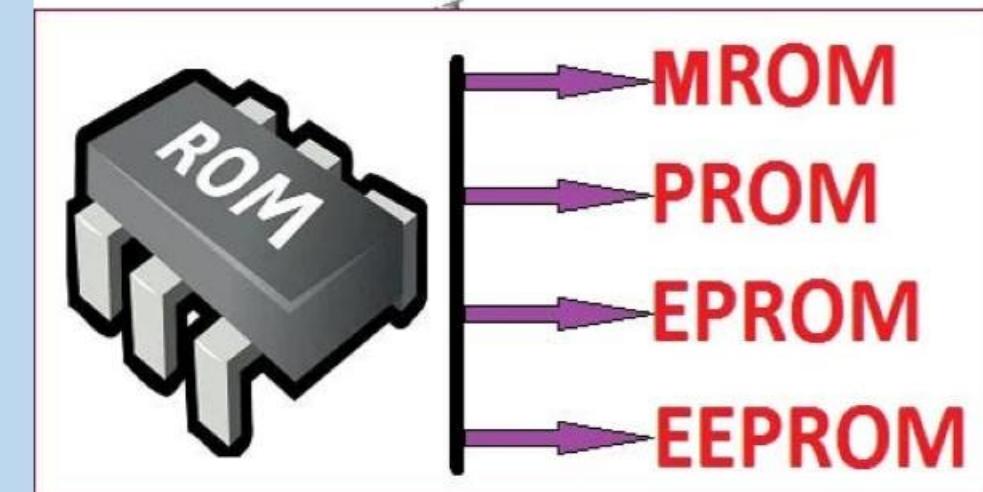
### 4. EEPROM (Electrically Erasable Programmable Read Only Memory):

Programmable and erasable electrically.

Programming and erasing take 4 to 10 milliseconds.

Can be erased 1 byte at a time.

Offers flexibility but slower compared to other types of memory.





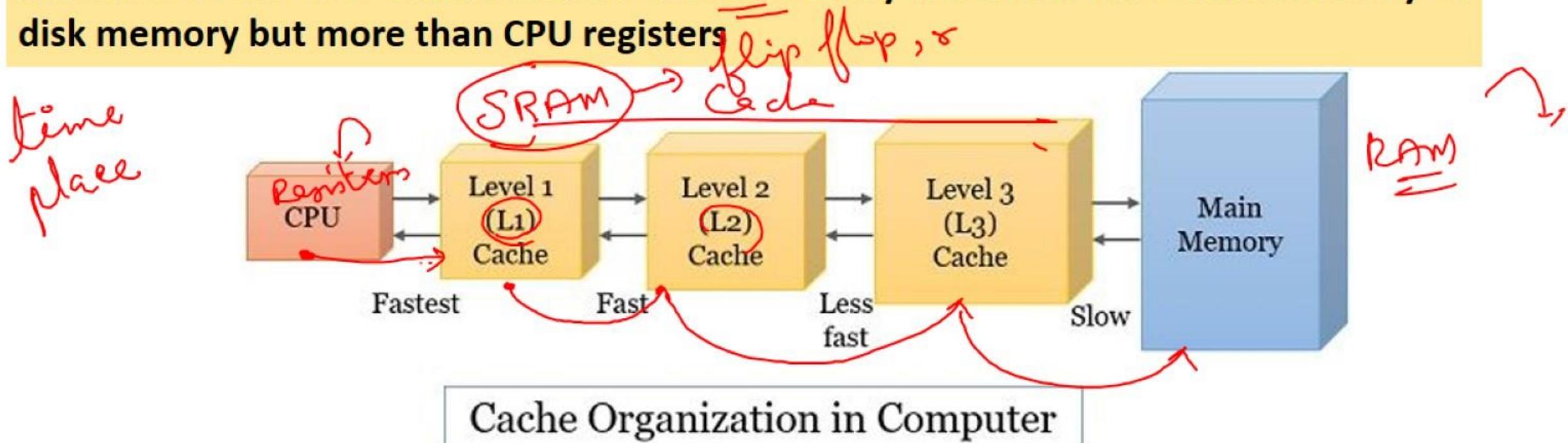
RAM	ROM
1. Temporary Storage	1. Permanent Storage
2. Store data in MBs	2. Store data in GBs
3. Volatile	3. Non-Volatile
4. Used in normal operation	4. Used for <u>startup</u> process of computer
5. Writing data is faster	5. Writing data is slower

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## Cache Memory → internal

Cache Memory is small-sized chip-based memory in a computer that lies between the main memory and CPU. It is very close to the chip of the CPU. The aim of this type of computer memory is to enhance the performance of the CPU. This memory is an extremely fast memory type that acts as a buffer between RAM and the CPU. This Memory holds frequently request data and instructions so that they are immediately available to the CPU when needed. Cache memory is costlier than main memory or disk memory but more than CPU registers



## External Memory:

- Also known as secondary or auxiliary memory.
  - Attached separately to the computer system.
  - Used for permanent data storage.
  - CPU cannot access directly; data transferred to primary memory first.
  - Not as fast as primary memory.
  - Examples include hard disks, solid-state drives (SSDs), optical disks, and USB flash drives.

*Cache  
RAM / ROM.*

Fast Memory      External  
Registers      Cache  
Cache  
RAM (ROM)





## Magnetic Storage Devices:

- Data encoded using magnetic fields.
- Each section magnetized represents Binary ONE, demagnetized represents Binary ZERO.
- Examples: Hard Disk Drives (HDDs), Magnetic Tapes, Floppy Disks.

## Solid State Storage Devices:

- Made of silicon microchips.
- Non-volatile retains data even when power is off.
- No moving parts, portable, and durable.
- Examples: Solid State Drives (SSDs), USB Flash Drives.

## Optical Storage Devices:

- Data read/written using laser beam.
- Consist of spinning discs with tracks, lands, and pits.
- Can store large amounts of data.
- Examples: CD-ROM, DVD-ROM, WORM (Write Once Read Many).

April 15 +  
-

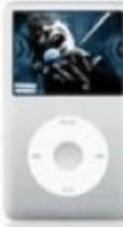
## EXTERNAL MEMORY



Memory Card Reader



USB Flash Memory



Media Devices



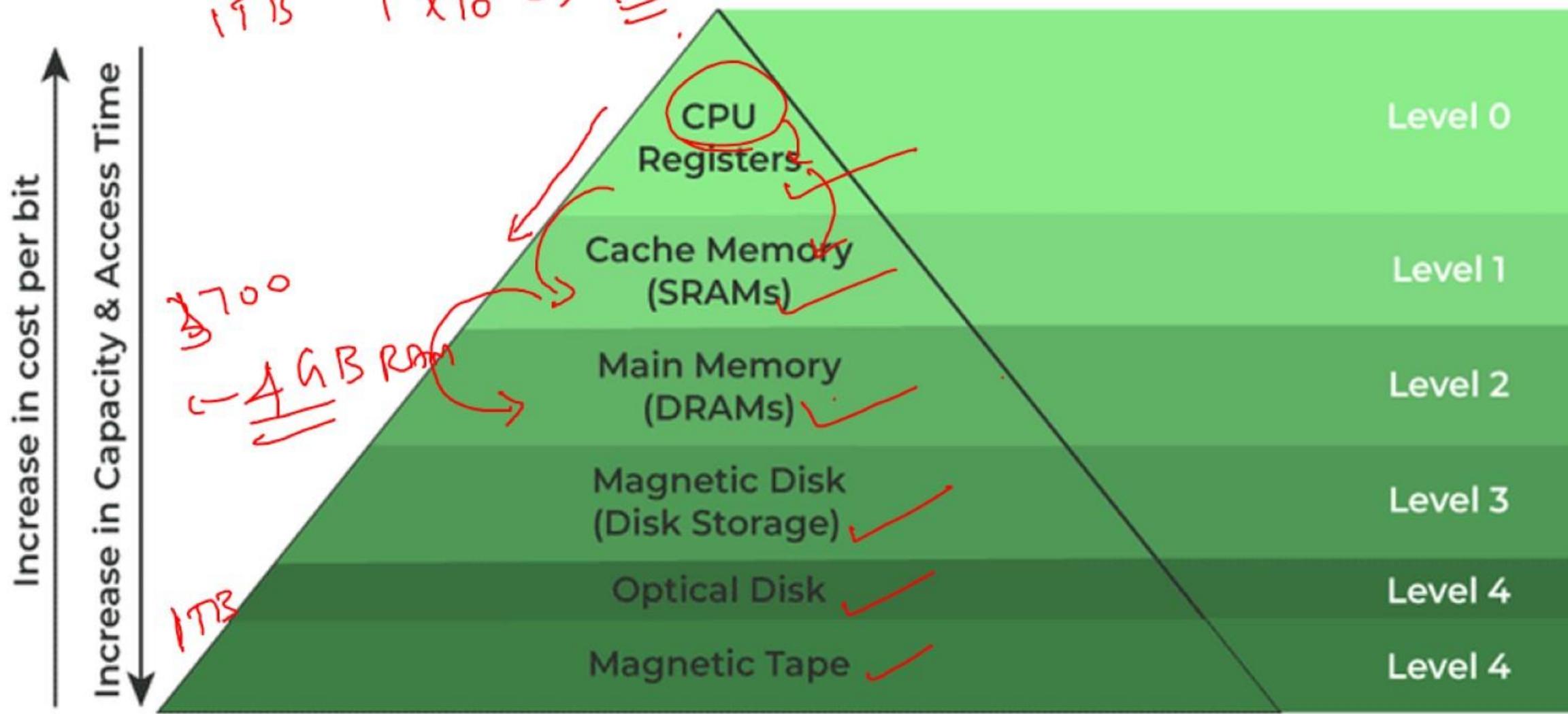
External Optical Drives



ZIP Drive



$$\begin{aligned} 4 \text{ TB} &\rightarrow 4 \times 10^9 \\ 1 \text{ TB} &\rightarrow 1 \times 10^{12} \rightarrow 4 \times 10^{12} \end{aligned}$$



## Memory Hierarchy Design



Match List I with List II.

List I (Computer Components)

- A. HDD
- B. RAM
- C. ROM
- D. CRT

List II (Description)

- 1. Visual Display Unit
- 2. Volatile Memory
- 3. External Memory
- 4. Non-Writable Memory

Choose the correct answer from the options given below:

- |        |     |     |     |
|--------|-----|-----|-----|
| 1. A-2 | B-3 | C-4 | D-1 |
| 2. A-3 | B-2 | C-1 | D-4 |
| 3. A-4 | B-3 | C-2 | D-1 |
| 4. A-3 | B-2 | C-4 | D-1 |



Given below are two statements:

~~Statement I~~ : CPU executes software directly from secondary memory. → *False*

**Statement II** : A software is termed as Open Source Software if it can be downloaded from the Internet.

In the light of the above statements, choose the correct answer from the options given below:

- (1) Both Statement I and Statement II are true
- (2) Both Statement I and Statement II are false
- (3) Statement I is true but Statement II is false
- (4) Statement I is false but Statement II is true



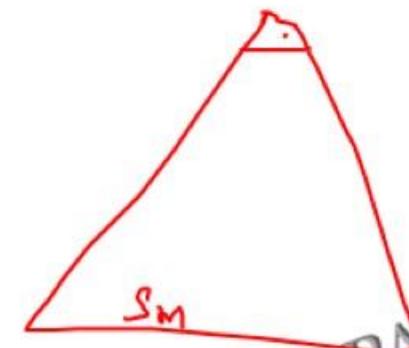
**Open source software (OSS) is software that is distributed with its source code, making it available for use, modification, and distribution with its original rights.**

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Identify the correct order of following computer memory types ranked from slowest to fastest in terms of access time.

- (A) Cache
- (B) CDROM
- (C) Hard Disk
- (D) RAM
- (E) Register



Choose the correct answer from the options given below:

- (1) (C), (B), (A), (D), (E)
- (2) (E), (A), (D), (C), (B)
- (3) (B), (C), (D), (A), (E)
- (4) (D), (A), (E), (B), (C)



Given below are two statements

**Statement I** : DRAM consists of a number of transistors and capacitors.

**Statement II** : DRAM needs to be constantly refreshed.

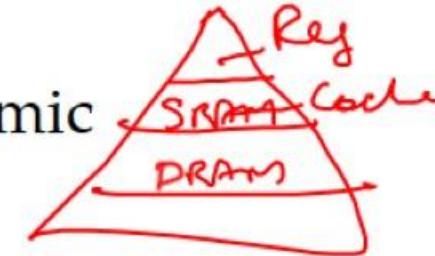
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- (1) Both Statement I and Statement II are true
- (2) Both Statement I and Statement II are false
- (3) Statement I is true but Statement II is false
- (4) Statement I is false but Statement II is true



Given below are two statements

- Statement I: Most PCs use Dynamic RAMs for CPU Cache ~~X~~
- Statement II: Static RAM is faster and more expensive than Dynamic RAM



In light of the above statements, choose the correct answer from the options given below:

1. Both Statement I and Statement II are false
2. Both Statement I and Statement II are true.
- ~~3. Statement I is false but Statement II is true.~~
4. Statement I is true but Statement II is false.



Given below are two statements

**Statement I: Cache memory is faster than random access memory**

**Statement II: Random access memory is closer to the processor than cache memory**

In light of the above statements, choose the most appropriate answer from the options given below

1. Both Statement I and Statement II are correct
2. Both Statement I and Statement II are incorrect
3. Statement I is correct but Statement II is incorrect
4. Statement I is incorrect but Statement II is correct

Arrange the following computer memory types from the slowest to the fastest speed:

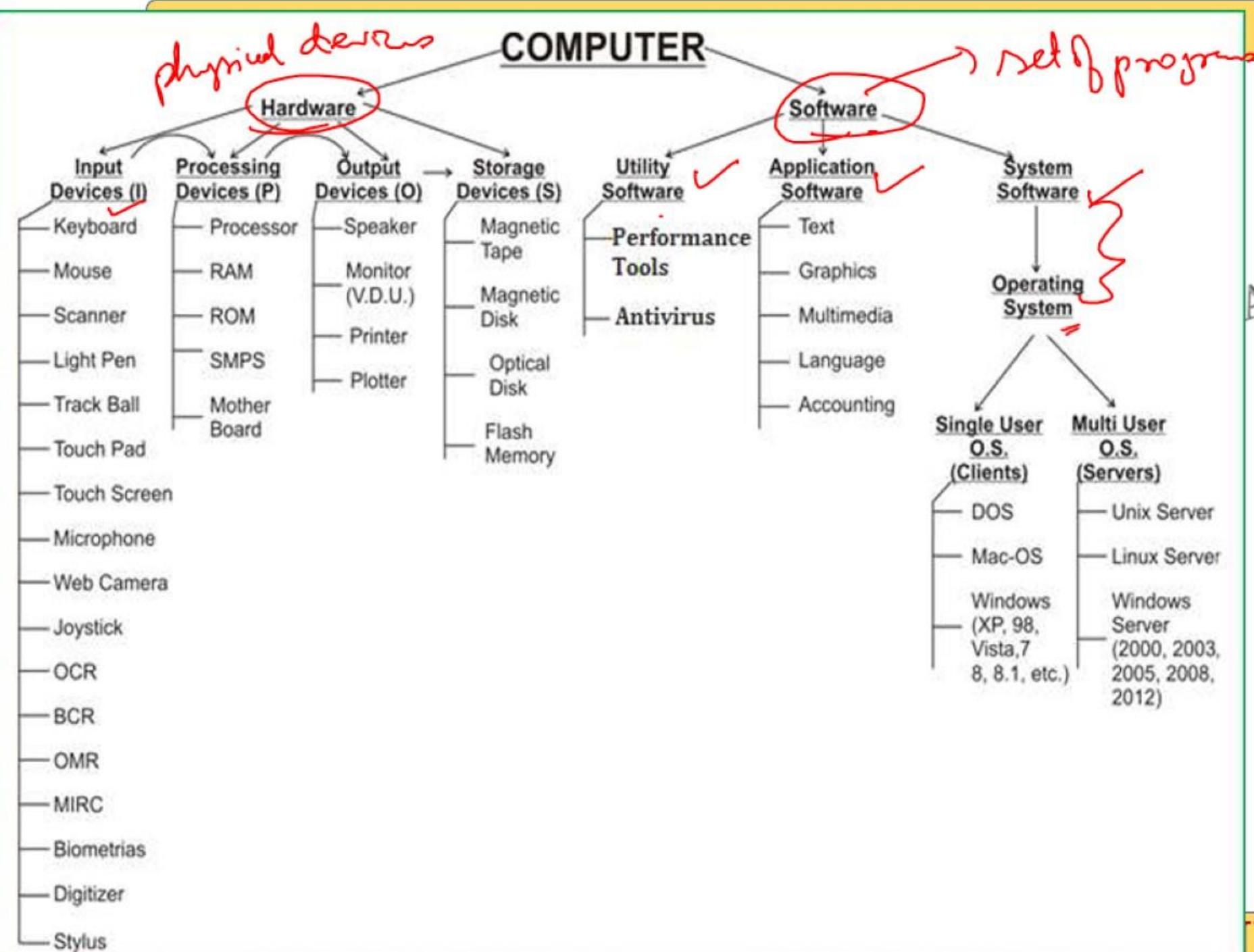
- A. Main memory (RAM) →
- B. L2 Cache →
- C. Hard Disk →
- D. L1 Cache →
- E. CD-ROM →

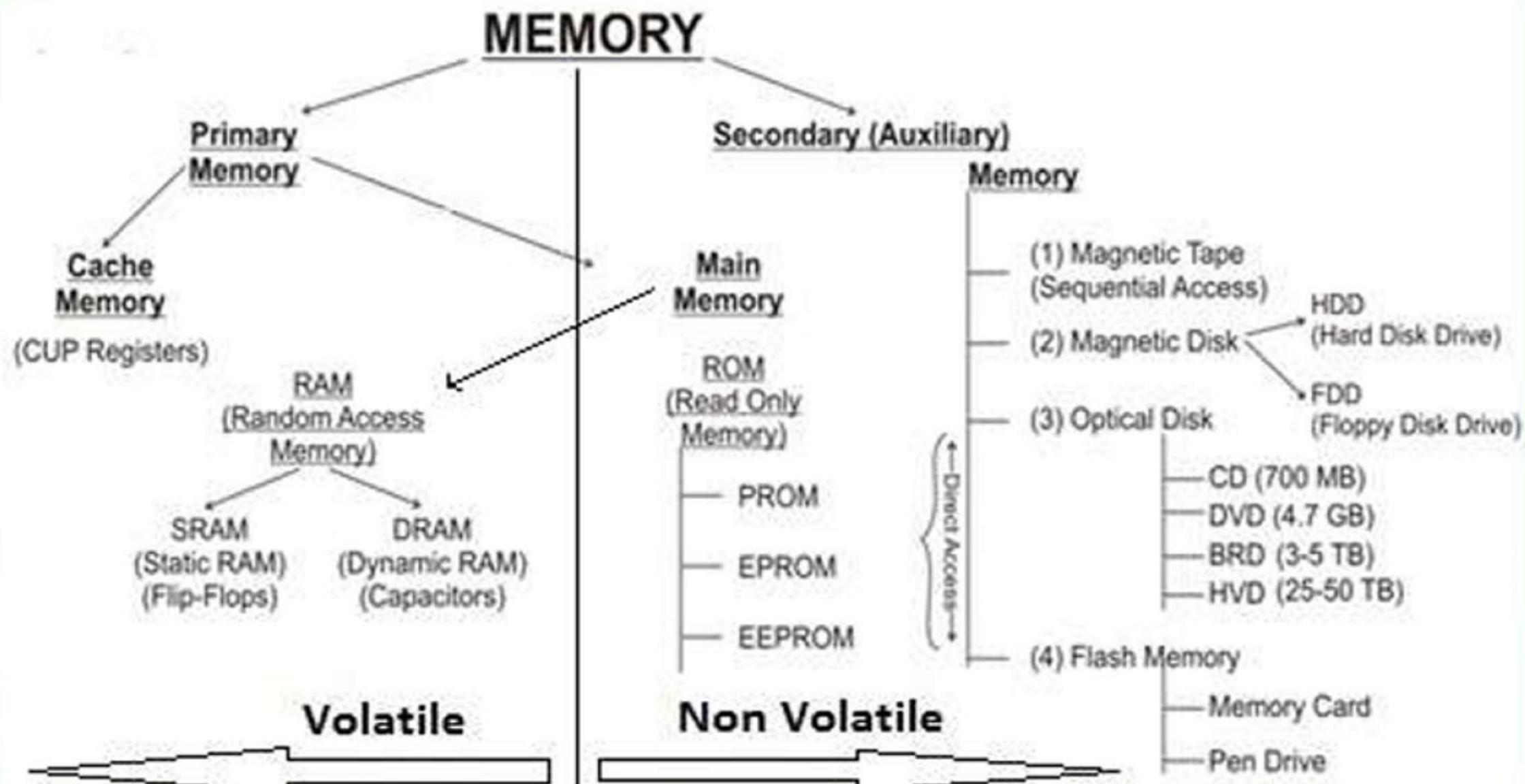
Choose the correct answer from the options given below:

- 1. E,C,A,B,D
- 2. E,C,A,D,B
- 3. B,D,A,C,E
- 4. C,E,B, A,D



ATHI







4 bit	1 nibble	NAD	2	4 marks - 20%	KMG
8 bit	1 byte				TPE (+)
1024 B	1 KB (Kilo Byte)				ZB
1024 KB	1 MB (Mega Byte)				
1024 MB	1 GB (Giga Byte)				
1024 GB	1 TB (Tera Byte)				
1024 TB	1 PB (Peta Byte)				
1024 PB	1 XB (Exa Byte)				
1024 XB	1 ZB (Zeta Byte)				
1024 ZB	1 YB (Yota Byte)				

1024 YB  
1024 BB

| Wrong Byte  
| Good Byte

R 1 THULASI BHARATHI

$10^3$   
 $10^6$   
 $10^9$   
 $10^{12}$   
 $10^{15}$   
 $10^{18}$   
 $10^{21}$   
 $10^{24}$

$2^{10}$   
 $2^{20}$   
 $2^{30}$   
 $2^{40}$   
 $2^{50}$   
 $2^{60}$   
 $2^{70}$   
 $2^{80}$



## Decimal, Binary, Octal and Hexadecimal Equivalents

Decimal	Binary	Octal	Hexadecimal
0	0000	000	0
1	0001	001	1
2	0010	002	2
3	0011	003	3
4	0100	004	4
5	0101	005	5
6	0110	006	6
7	0111	007	7
8	1000	010	8
9	1001	011	9
10	1010	012	A
11	1011	013	B
12	1100	014	C
13	1101	015	D
14	1110	016	E
15	1111	017	F

8  
 1-0

Terms

- ❖ The **Internet** is a global system of interconnected computer networks that use the standard Internet protocol suite (TCP/IP) to link several billion devices worldwide.
- ❖ It is a **network of networks** that consists of millions of private, public, academic, business, and government networks, of local to global scope, that are linked by a broad array of electronic, wireless, and optical networking technologies.
- ❖ The **World Wide Web** (abbreviated as WWW or W3, commonly known as the Web) is a system of interlinked hypertext documents that are accessed via the Internet.
- ❖ A **Website**, is a set of related web pages served from a single web domain.
- ❖ **Downloading** means to receive data to a local system from a remote system, or to initiate such a data transfer
- ❖ **Uploading** refers to the sending of data from a local system to a remote system such as a server or another client with the intent that the remote system should store a copy of the data being transferred
- ❖ An **Internet Protocol address** (also known as an **IP address**) is a numerical label assigned to each device (e.g., computer, printer) participating in a computer network. It acts as an identifier for a computer. It is a unique address for every computer.
- ❖ An **email attachment** is a computer file sent along with an **email message**. One or more files can be attached to any email message, and be sent along with it to the recipient.



**1. Subject Line:** This summarizes the purpose or content of the email. It should be concise and informative to give the recipient an idea of what the email is about.

**2. Greeting:** The salutation at the beginning of the email. This can vary depending on the relationship with the recipient, ranging from formal (e.g., "Dear Mr. Smith") to informal (e.g., "Hi Jane").

**3. Body:** This is the main content of the email where you convey your message, provide information, ask questions, or make requests. It's important to be clear and concise, using paragraphs to organize your thoughts if necessary.

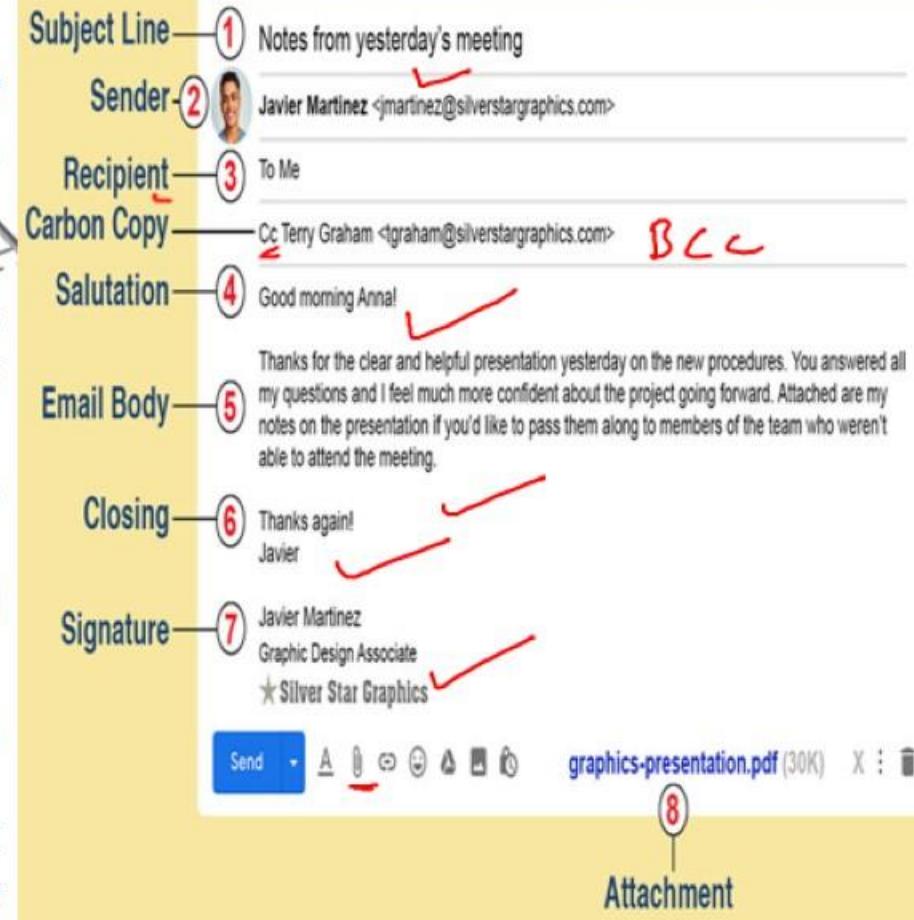
**4. Closing:** A polite way to end the email. This can include phrases like "Sincerely," "Best regards," "Thank you," etc., followed by your name.

**5. Signature:** Your name, job title, and contact information may be included here, depending on the context and your preference.

**6. Attachments:** If you're sending files or documents along with the email, they can be attached at the end.

**7. CC/BCC:** If you're copying others on the email (CC for visible recipients, BCC for hidden recipients), this should be indicated usually below the main body of the email.

## PARTS OF AN EMAIL





**CC (Carbon Copy):** Sends a copy of the email to additional recipients, visible to all other recipients.

**BCC (Blind Carbon Copy):** Sends a copy of the email to additional recipients without other recipients knowing about it.

### CC Vs BCC

CC and BCC involves the copy of an email sent to the person intended and the other person(s) involved in the email conversation.

**CC**

EVERYONE can see the people tagged.

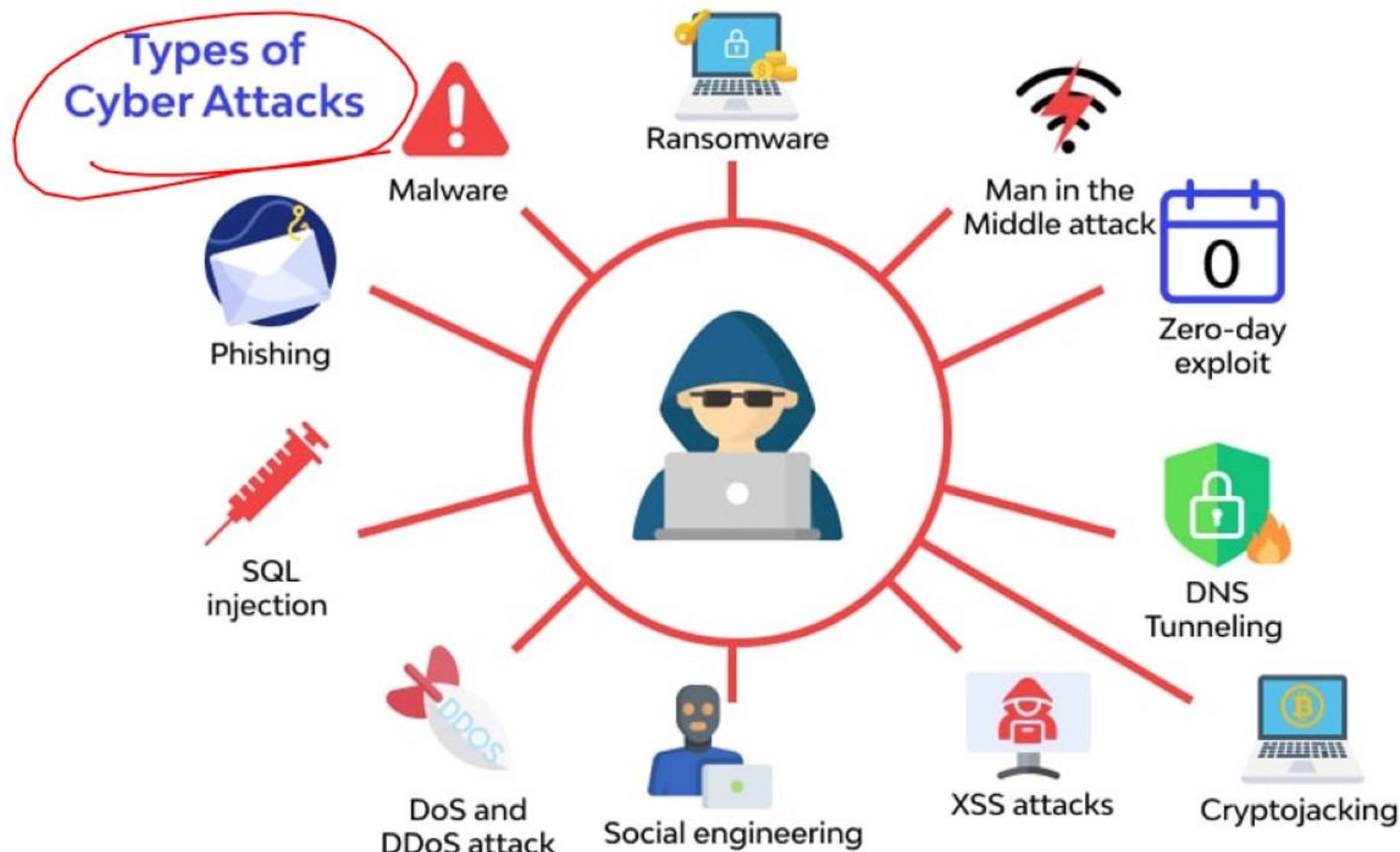
ALLOWS a recipient to know to whom a copy of an email has been sent

**BCC**

ONLY the person tagged see themselves

PREVENTS the recipient from getting to know to whom a copy of an email has been sent.





A cyber attack is a type of attack that targets computer systems, infrastructures, networks or personal computer devices using various methods at hands.

*Malicious software harmful*

**Malware:** Nefarious software designed for various malicious activities like network access, credential theft, or disruption. Example: Ransomware attacks.

*Phishing*

**Phishing:** Deceptive method where attackers trick targets into divulging sensitive information like passwords or credit card details. Example: Fake OTP requests.

**Man-in-the-middle attack (MITM):** Intercepting communication between parties to spy.

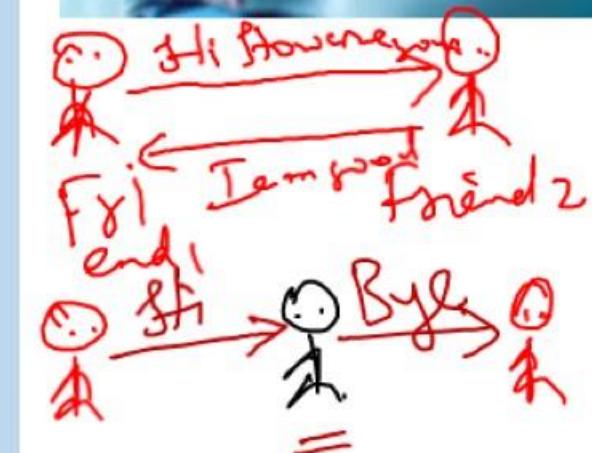
Reduced by end-to-end encryption. Example: Intercepting sensitive data during transmission.

**Distributed Denial-of-Service (DDoS) attack:** Overwhelming a target server with traffic to disrupt services. Example: Crashing a website by flooding it with requests.

*Structured Query Language*

**SQL Injection:** Manipulating SQL queries to access or modify databases. Example: Unauthorized alteration of database contents.

**Zero-day exploit:** Exploiting software vulnerabilities until a fix is available. Example: Exploiting a newly discovered software flaw before a patch is released.





## Domain Name Servers

DNS Tunnelling: Using DNS protocol to establish covert communication channels. Example: Evading detection while exfiltrating data from a network.

Business Email Compromise (BEC): Targeting employees to initiate fraudulent transactions. Example: Convincing an employee to transfer funds to a hacker-controlled account.

Cryptojacking: Illicitly using someone's computer to mine cryptocurrencies. Example: Secretly using computer resources to mine Bitcoin.

Drive-by Attack: Infecting visitors' devices with malware by exploiting vulnerabilities in websites. Example: Infecting devices by simply visiting a compromised website.

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## IMPORTANT CYBER ATTACKS TERMINOLOGIES

1. **Virus:** A malicious program that attaches itself to a legitimate file and spreads when the file is executed, often causing harm to the host system. *Rava, PSOOGI, Flour*.
2. **Worm:** A self-replicating malware that spreads across networks without needing user interaction. It can cause harm by consuming system resources or exploiting vulnerabilities.
3. **Trojan Horse:** Malware disguised as legitimate software. It tricks users into installing it, then performs harmful actions like stealing data, spying, or granting unauthorized access to the system.
4. **Logic Bomb:** A piece of code inserted into software that triggers a malicious action when certain conditions are met, such as a specific date or event.
5. **Pharming:** Redirecting website traffic to a fake site that mimics a legitimate one to gather sensitive information, such as login credentials or financial data.
6. **Spoofing:** Falsifying information to appear as someone or something else. This can include email spoofing, IP address spoofing, or caller ID spoofing.
7. **Spam:** Unsolicited and often irrelevant or inappropriate messages sent in bulk, typically via email, instant messaging, or social media, for advertising or phishing purposes.
8. **Smishing:** Phishing attacks conducted via SMS or text messages, where attackers trick users into revealing personal information or downloading malware onto their mobile devices.
9. **Vishing:** Phishing attacks conducted over voice calls, where attackers impersonate legitimate entities like banks or government agencies to deceive victims into revealing sensitive information.

**1. Phishing:**

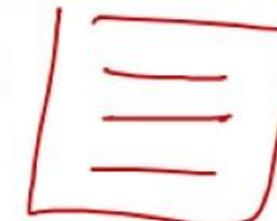
- Phishing is a form of cyber attack where attackers use deceptive emails, messages, or websites to trick individuals into providing sensitive information such as usernames, passwords, credit card numbers, or other personal data.
- Phishing attacks typically occur through email, where attackers impersonate legitimate entities like banks, social media platforms, or online services, and persuade recipients to click on malicious links or attachments or to enter their information on fake websites.
- Example: A fake email claiming to be from a bank, asking the recipient to log in to their account through a provided link, which leads to a phishing website designed to steal their login credentials.

**2. Vishing:**

*→ Daaking dakash vishing*

- Vishing, short for "voice phishing," is a type of social engineering attack where attackers use phone calls to deceive individuals into revealing sensitive information or performing certain actions.
- In vishing attacks, attackers typically impersonate trusted entities like banks, government agencies, or tech support, and use persuasive tactics to manipulate victims over the phone.
- Example: A phone call claiming to be from a bank, informing the recipient of suspicious activity on their account and asking them to provide their account details or to transfer funds to a "secure" account.

Sbi.co.in    onlinesbi.sbi    sbi.co.in





→ SMS

## Smishing:

1. Smishing is a variation of phishing that takes place through SMS or text messages instead of email. Attackers send deceptive text messages to trick individuals into providing sensitive information or clicking on malicious links.
2. Smishing attacks often involve urgent or enticing messages, such as fake prize notifications, security alerts, or requests to verify account information.
3. Example: A text message claiming to be from a delivery service, asking the recipient to click on a link to track a package, which leads to a phishing website designed to steal their personal information.

Pharming: @UNIV

Redirected to another website

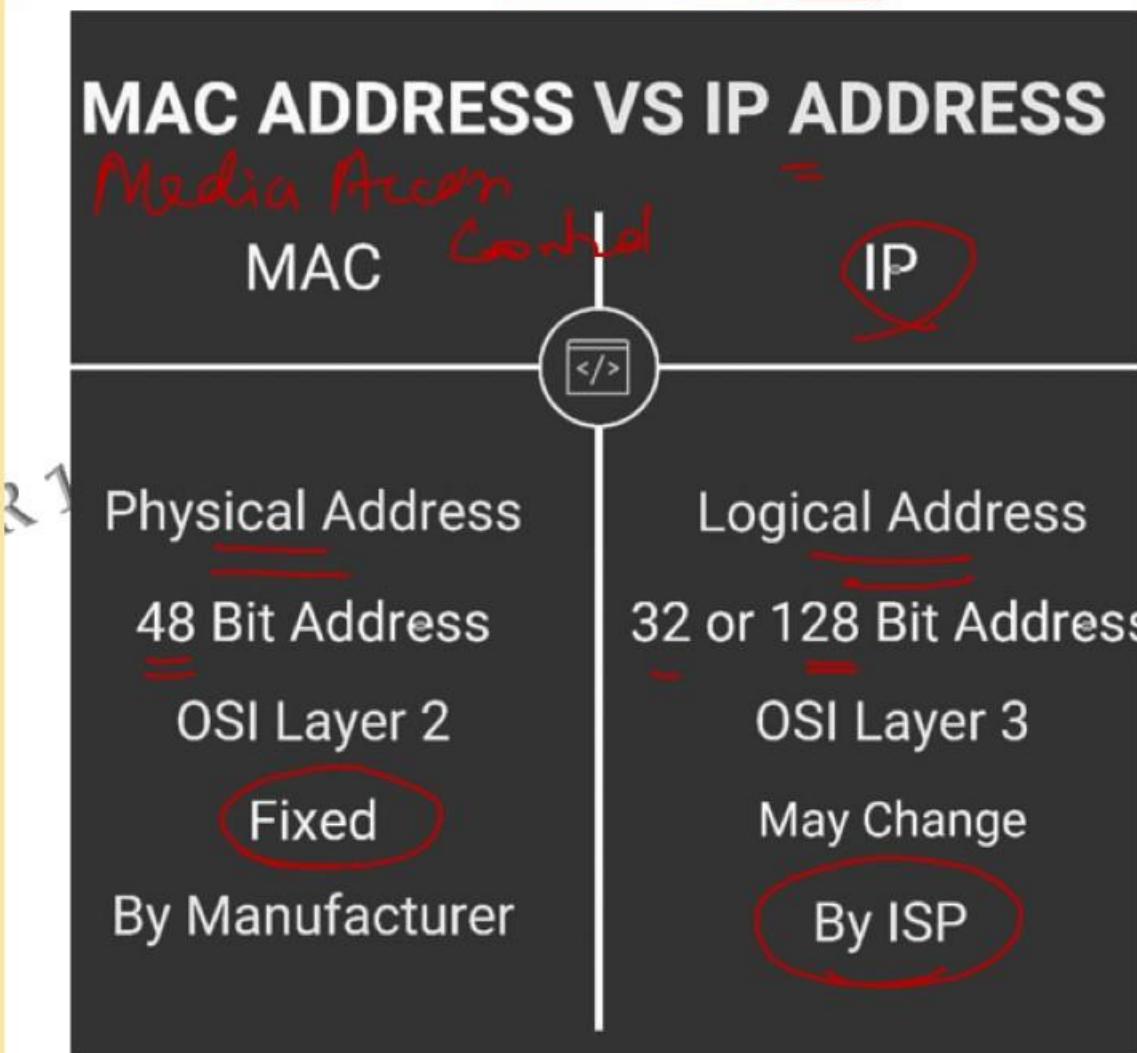
# Protocol → Set of Rules & Regulations

ICT



Unify Study  
United Information for You

- **IP (Internet Protocol)**: Routes data packets across networks.
- **TCP (Transmission Control Protocol)**: Ensures reliable data transmission.
- **HTTP (Hypertext Transfer Protocol)**: Transmits web pages.
- **HTTPS (Hypertext Transfer Protocol Secure)**: Secures web communication.
- **FTP (File Transfer Protocol)**: Transfers files between clients and servers.
- **SMTP (Simple Mail Transfer Protocol)**: Sends email messages.
- **POP3 (Post Office Protocol version 3)**: Retrieves email from servers.
- **IMAP (Internet Message Access Protocol)**: Retrieves and manages email on servers.
- **DNS (Domain Name System)**: Translates domain names to IP addresses.
- **SSH (Secure Shell)**: Enables secure remote login and command execution.

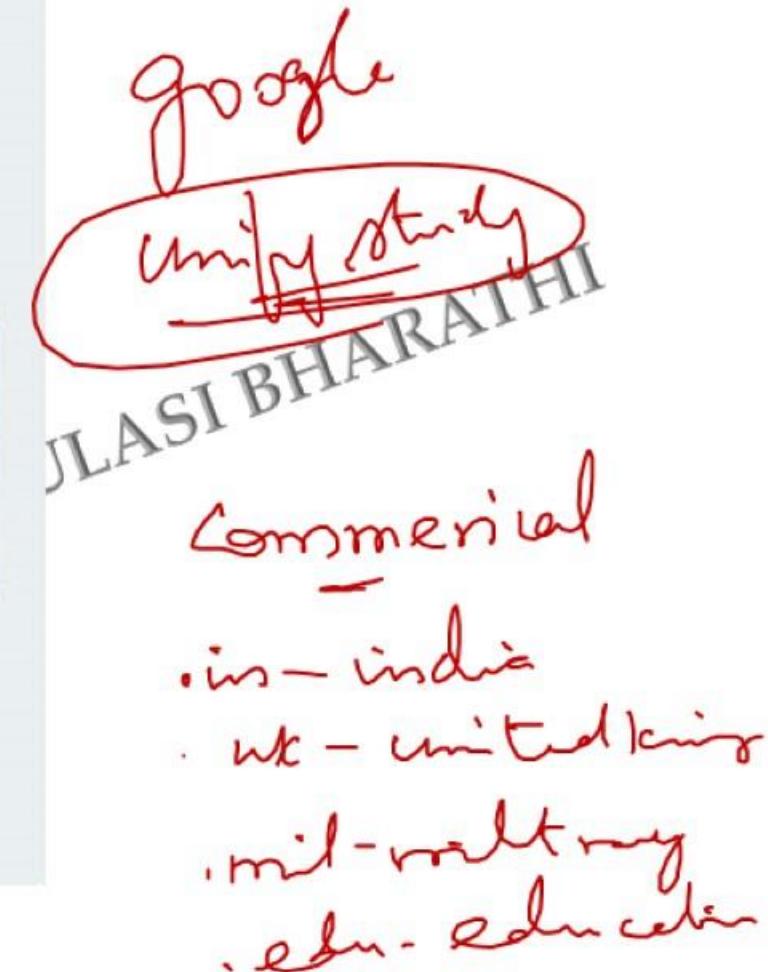
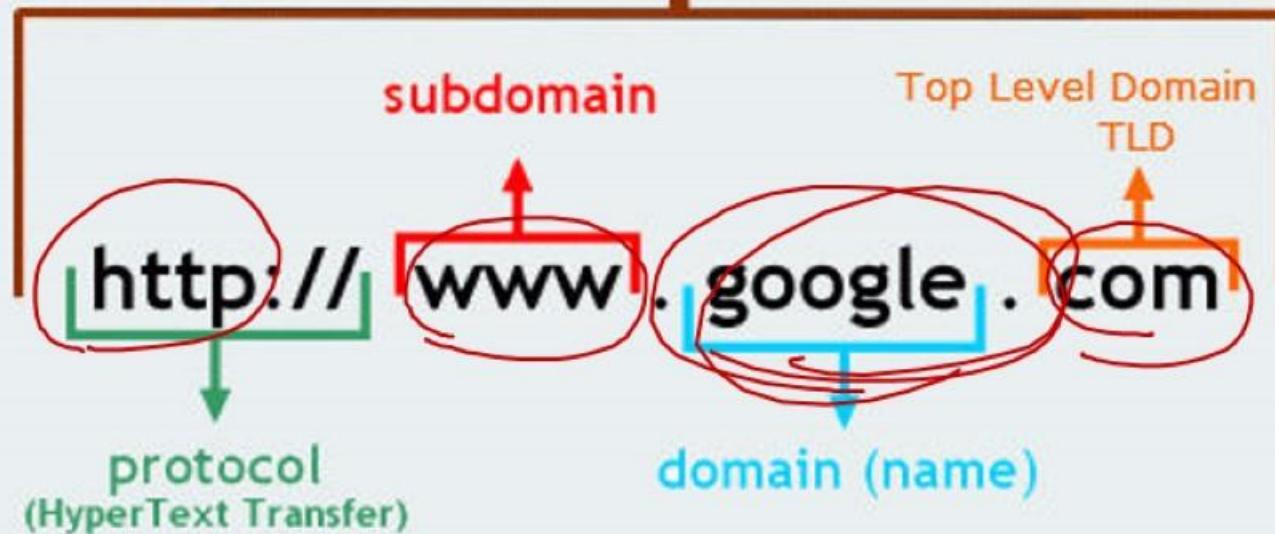


https:



# URL

## Uniform Resource Locator





A **search engine** is a specific type of **website** that enables users to find **data** on the **Internet**. Users enter the necessary keywords into the search field to get the information. After that, the search engine scans its index for relevant web pages and lists them on the screen. The Internet is a huge source of data and resources that may be used to access the **resources**, and there are various types of **software**, sometimes known as **search engines**. This search software includes **Google**, **Duck Duck Go**, **Bing**, **Baidu**, **Yahoo**, etc.

A **web browser** is an application software instance designed and developed to get and display data from HTML files or web **pages** stored on **online servers**. **Sir Tim Berners-Lee** developed the first web browser in **1990**, and **mosaic** developed the first graphical web browser in **1993**. After that, other web browsers were created. Netscape Communication's Navigator, Google Chrome, Microsoft Edge, Opera, Mozilla Firefox, and Apple Safari are some of them.





### Match List I with List II

<b>List I (Storage Device or Media)</b>	<b>List II (Description)</b>
A. Blue-ray disc	I. Non-volatile memory that can only be read from and not written to
B. SSD	I. Optical storage media that allows very high storage capacity by using blue/violet laser technology.
C. ROM	I. Volatile memory that stores data, programs and the parts of the operating system that are currently in use.
D. RAM	I. Device that stores data by controlling the movement of electrons within a microchip; there are no moving parts.

**Choose the correct answer from the options given below**

- (a) A-I B-IV C-II D-III
- (b) A-III B-I C-IV D-II
- (c) A-IV B-II C-I D-III
- (d) A-II B-IV C-I D-III


**Match List I with List II**

<b>List I (Storage Device or Media)</b>	<b>List II (Description)</b>
A. Blue-ray disc	I. Non-volatile memory that can only be read from and not written to
B. SSD	II. Optical storage media that allows very high storage capacity by using blue/violet laser technology.
C. ROM	III. Volatile memory that stores data, programs and the parts of the operating system that are currently in use.
D. RAM	IV. Device that stores data by controlling the movement of electrons within a microchip; there are no moving parts.

**Choose the correct answer from the options given below**

- (a) A-I B-IV C-II D-III
- (b) A-III B-I C-IV D-II
- (c) A-IV B-II C-I D-III
- (d) A-II B-IV C-I D-III



Identify the correct order of the words A-D given below to complete the following sentences about College Registration Systems:

Biometric is a type of registration system that uses finger prints or retina scans to register students. A type of registration that uses a form that has been completed with a pencil and is then scanned by a machine after being completed is called OMR registration. A tag that uses microchips and radio signals worn by all students that registers them when they enter the classroom is called RFID registration. SC are made of plastic and contain a chip that can be swiped through a machine to register the student.

A. Smart Cards      B. OMR      C. Biometric

D. RFID

Choose the correct answer from the options given below

- (a) A, B, D, C
- (b) B, C, A, D
- (c) D, A, C, B
- (d) C, B, D, A

OCR



Given below are two statements: (1 KB = 1024 bytes)

$$\frac{1}{5} \stackrel{5}{\cancel{5}} \stackrel{1.0}{\cancel{1.0}}$$

**Statement-I:** 0.2 terabytes (TB) is equal to 204.8 gigabytes (GB)

**Statement-II:** 1 petabyte (PB) is equal to  $2^{53}$  bits.

In the light of the above statements, choose the correct answer from the options given below

- (a) Both Statement I and Statement II are true
- (b) Both Statement I and Statement II are false
- (c) Statement I is true but Statement II is false
- (d) Statement I is false but Statement II is true

$$\begin{aligned}
 1KB &\rightarrow 1024 \text{ bytes} \rightarrow 2^{10} \\
 1MB &\rightarrow 1024KB \rightarrow 2^{20} \\
 1GB &\rightarrow 1024MB \rightarrow 2^{30} \\
 1TB &\rightarrow 1024GB \rightarrow 2^{40} \\
 1PB &\rightarrow 1024TB \rightarrow 2^{50}
 \end{aligned}$$

$$1TB = 1024GB$$

$$0.2TB = 1024 \times$$

$$\begin{array}{r}
 0.2 \\
 \hline
 204.8
 \end{array} \text{ GB}$$



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Given below are two statements: (1 KB = 1024 bytes)

**Statement-I:** 0.2 terabytes (TB) is equal to 204.8 gigabytes (GB)

**Statement-II:** 1 petabyte (PB) is equal to  $2^{53}$  bits.

In the light of the above statements, choose the correct answer from the options given below

- (a) Both Statement I and Statement II are true
- (b) Both Statement I and Statement II are false
- (c) Statement I is true but Statement II is false
- (d) Statement I is false but Statement II is true



**Which of the following statements about email are TRUE?**

- A. You can create folders to store and organise your emails.
- B. Using the Cc feature will hide all other recipients from each other.
- C. You can add attachments of any file size to an email.
- D. You can add signatures to your emails to give personal contact details.
- E. You can only send emails from a laptop computer.

**Choose the correct answer from the options given below**

- (a) A and B only
- (b) A and C only
- (c) A and D only
- (d) B, C and E only



## Which of the following statements about email are TRUE?

- A. You can create folders to store and organise your emails.
- B. Using the ~~B~~Cc feature will hide all other recipients from each other.
- C. You can add attachments of any file size to an email.
- D. You can add signatures to your emails to give personal contact details.
- E. You can only send emails from a laptop computer.

**Choose the correct answer from the options given below**

- (a) A and B only
- (b) A and C only
- (c) A and D only**
- (d) B, C and E only



Which is the smallest of these data storage capacities?

(a) 2 KB

2048

KB

$\rightarrow$  2048 bytes

$1 \text{ KB} = 1024$

(b) 2049 Bytes

MB

$2 \text{ KB} = 2048$

(c) 0.5 MB

$\rightarrow 0.5 \text{ MB}$   
 $= 512 \text{ KB}$

GB

1 MB  $1024 \text{ KB}$

(d) 3 GB

TB

$0.5 \text{ MB} = 1024 \text{ KB}$

PB

$512 \text{ KB}$

bits  
bytes  
8 bits = (bytes)

8 bits = (bytes)

EB

EB

ZB

XB



**Which is the smallest of these data storage capacities?**

- (a) 2 KB**
- (b) 2049 Bytes**
- (c) 0.5 MB**
- (d) 3 GB**

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A photograph occupies 10 MB of storage. A memory stick with 4GB capacity can store approximately ? such photographs.

(a) 300

(b) 400

(c) 500

(d) 450

Each photograph = 10 MB

Memory stick = 4 GB

$$= 4 \times 1024 \text{ MB}$$

Capacity of the memory stick

$$= 4096 \text{ MB} / 10 \text{ MB} = 400$$

A photograph occupies 10 MB of storage. A memory stick with 4GB capacity can store approximately \_\_\_\_\_ such photographs.

- (a) 300              (b) 400              (c) 500              (d) 450

**Identify the correct order of the following list of stages A-E when an email is sent and received.**

- A. Sender's ISP mail server decides how to route the message, and the message travels over the internet and arrives at recipient's ISP mail server.
- B. Message retrieved and sent to recipient's computer to be opened and read.
- C. The sender composes his message and activates the send command.
- D. Message held in recipient's electronic mail box and recipient logs on to read his messages.
- E. Message is sent to sender's ISP mail server and this server examines address associated with message.

**Choose the correct answer from the options given below**

- (a) C, E, A, B, D
- (b) A, C, B, D, E
- (c) D, B, C, E, A
- (d) C, E, A, D, B



Identify the correct order of the following list of stages A-E when an email is sent and received.

- (3) A. Sender's ISP mail server decides how to route the message, and the message travels over the internet and arrives at recipient's ISP mail server.
- B. Message retrieved and sent to recipient's computer to be opened and read.
- (1) C. The sender composes his message and activates the send command.
- (4) D. Message held in recipient's electronic mail box and recipient logs on to read his messages.
- (2) E. Message is sent to sender's ISP mail server and this server examines address associated with message.

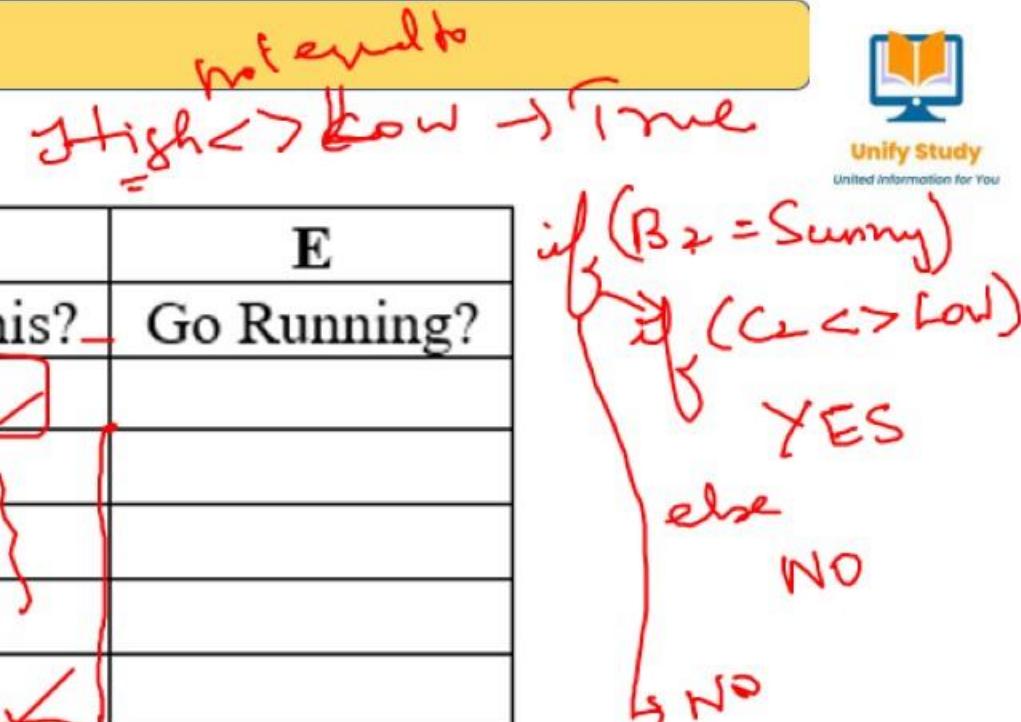
Choose the correct answer from the options given below

- ?
- (a) C, E, A, B, D      (b) A, C, B, D, E      (c) D, B, C, E, A      (d) C, E, A, D, B



Consider the following in MS-EXCEL spreadsheet

	A	B	C	D	E
1.	Day -	Weather -	Temp. -	Play Tennis? -	Go Running?
2.	Monday	Sunny	High	Yes ✓	
3.	Tuesday	Windy	High	No }	
4.	Wednesday	Raining	Medium	No }	
5.	Thursday	Sunny	Low	No	
6.	Friday	Sunny	Medium	YES ✓	



Suppose the formula = (IF (B2 = "Sunny", IF ( $C2 < \text{Low}$ , "Yes", "No"), "No")) is entered into D2 and then the cell is copied and pasted to D3:D6. On what days does column D report "Yes"?

- (a) Monday and Friday only (b) Monday and Tuesday only
- (c) Thursday and Friday only (d) Monday, Thursday and Friday



Consider the following in MS-EXCEL spreadsheet

	A	B	C	D	E
1.	Day	Weather	Temp.	Play Tennis?	Go Running?
2.	Monday	Sunny	High	<u>L</u> <u>T</u>	<u>Y</u> <u>E</u> <u>S</u>
3.	Tuesday	Windy	High	<u>C</u> <u>D</u>	
4.	Wednesday	Raining	Medium		
5.	Thursday	Sunny	Low		
6.	Friday	Sunny	Medium		

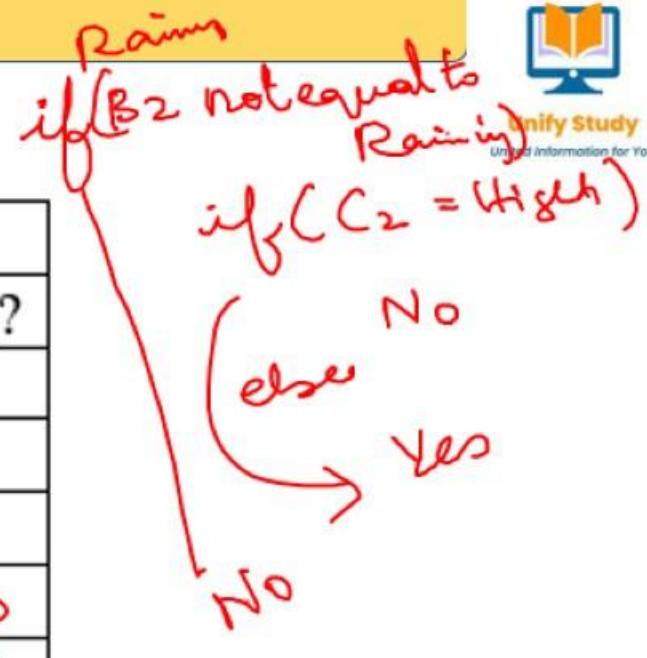
Suppose the formula = IF (B2 = "Sunny", IF (C2 <> "Low", "Yes", "No"), "No") is entered into D2 and then the cell is copied and pasted to D3:D6. On what days does column D report "Yes"?

- (a) Monday and Friday only
- (b) Monday and Tuesday only
- (c) Thursday and Friday only
- (d) Monday, Thursday and Friday



Consider the following MS-EXCEL spreadsheet:

	A	B	C	D	E
1.	Day	Weather	Temp	Play Tennis?	Go Running?
2.	Monday	Sunny	High		↑ No
3.	Tuesday	Windy	High		No
4.	Wednesday	Raining	Medium		No
5.	Thursday	Sunny	Low		YES
6.	Friday	Sunny	Medium		YES



Suppose the formula – IF (B2 <> “Raining”, IF (C2 = “High”, “No”, “Yes”), “No”) is entered into E2 and then the cell is copied and pasted to E3:E6, On what days does Column E report “Yes”?

Note: (The symbol <> represents “NOT EQUAL TO”).

- (a) Monday and Friday only
- (b) Monday and Tuesday
- (c) Thursday and Friday only
- (d) Monday, Thursday and Friday



Consider the following MS-EXCEL spreadsheet:

	A	B	C	D	E
1.	Day	Weather	Temp	Play Tennis?	Go Running?
2.	Monday	Sunny	High		
3.	Tuesday	Windy	High		
4.	Wednesday	Raining	Medium		
5.	Thursday	Sunny	Low		
6.	Friday	Sunny	Medium		

Suppose the formula – IF (B2 <> “Raining”, IF (C2 = “High”, “No”, “Yes”), “No”) is entered into E2 and then the cell is copied and pasted to E3:E6, On what days does Column E report “Yes”?

Note: (The symbol <> represents “NOT EQUAL TO”).

- |                              |                                 |
|------------------------------|---------------------------------|
| (a) Monday and Friday only   | (b) Monday and Tuesday          |
| (c) Thursday and Friday only | (d) Monday, Thursday and Friday |



Identify the correct order of the following terms A-E to complete the paragraph given below that explains how data is sent securely over the Internet using the Transport Layer Security (TLS) protocol:

'The browser requests the web server to identify itself by providing its certificate. This is sent and a check is performed to see if it is authentic. If it is, the browser sends a signal back to the web server and data transmission begins.'

- A. authentic    B. browser    C. certificate    D. signal    E. web server

Choose the correct answer from the options given below

- (a) C, B, D, A, E    (b) E, C, A, B, D    (c) D, C, A, B, E    (d) B, C, A, E, D



$$1 \text{ TB} = 2^{40} \text{ Bytes}$$

If one MegaByte is equal to  $2^{20}$  Bytes of computer data storage,  
then 2048 Terabytes is equal to \_\_\_\_\_ bits of data storage.

- (a)  $2^{51}$       (b)  $2^{44}$       (c)  $2^{54}$       (d)  $2^{57}$

$$\begin{aligned} 1 \text{ KB} &= 2^{10} \\ 1 \text{ MB} &= 2^{20} \\ 1 \text{ GB} &= 2^{30} \\ 1 \text{ TB} &= 2^{40} \\ 2048 \text{ TB} &= 2 \times 1024 \text{ TB} \\ &= 2^{11} \text{ TB} \\ &= 2^{11} \times 1 \text{ TB} \\ &= 2^{11} \times 2^{40} \text{ Bytes} \\ &= 2^{51} \text{ Bytes} \\ &= 2^{51} \times 8 \text{ Bits} \\ &= 2^{54} \text{ Bits} \end{aligned}$$

$$2048 \text{ TB} \\ 2^{11}$$



If one MegaByte is equal to  $2^{20}$  Bytes of computer data storage, then 2048 Terabytes is equal to \_\_\_\_\_ bits of data storage.

- (a)  $2^{51}$
- (b)  $2^{44}$
- (c)  $2^{54}$
- (d)  $2^{57}$



Identify the correct order of the following terms A-D to complete the sentences given below:

The action of sending emails to fraudulently obtain another person's bank details is called phishing.

The action of illegally installing malicious code which redirects a person to a fraudulent website with the purpose of obtaining that person's bank details is called pharming. Unsolicited bulk emails are called spam. The action of sending text messages to fraudulently obtain another person's bank details is called Smishing.

- A. Pharming      B. Smishing      C. Phishing      D.  
Spam

Choose the correct answer from the options given below:

- (a) C, A, D, B      (b) A, C, B, D      (c) B, A, D, C      (d) D,  
A, C, B



Given below are two statements:

**Statement I:**  $(240)_{10} = (11110000)_2$

**Statement II:**  $(10101111101010)_2 = (57EA)_{16}$

In light of the above statements, choose the correct answer from the options given below:

- (a) Both Statement I and Statement II are correct
- (b) Both Statement I and Statement II are incorrect
- (c) Statement I is correct but Statement II is incorrect
- (d) Statement I is incorrect but Statement II is correct

A - 10

B - 11

C - 12

D - 13

E - 14

F - 15

$2^4 = 16$

$2^3 = 8$

$2^2 = 4$

$2^1 = 2$

$2^0 = 1$

$2^{-1} = \frac{1}{2}$

$2^{-2} = \frac{1}{4}$

$2^{-3} = \frac{1}{8}$

$2^{-4} = \frac{1}{16}$

$2^{-5} = \frac{1}{32}$

$2^{-6} = \frac{1}{64}$

$2^{-7} = \frac{1}{128}$

$2^{-8} = \frac{1}{256}$

$2^{-9} = \frac{1}{512}$

$2^{-10} = \frac{1}{1024}$

$2^{-11} = \frac{1}{2048}$

$2^{-12} = \frac{1}{4096}$

$2^{-13} = \frac{1}{8192}$

$2^{-14} = \frac{1}{16384}$

$2^{-15} = \frac{1}{32768}$

$2^{-16} = \frac{1}{65536}$

$2^{-17} = \frac{1}{131072}$

$2^{-18} = \frac{1}{262144}$

$2^{-19} = \frac{1}{524288}$

$2^{-20} = \frac{1}{1048576}$

$2^{-21} = \frac{1}{2097152}$

$2^{-22} = \frac{1}{4194304}$

$2^{-23} = \frac{1}{8388608}$

$2^{-24} = \frac{1}{16777216}$

$2^{-25} = \frac{1}{33554432}$

$2^{-26} = \frac{1}{67108864}$

$2^{-27} = \frac{1}{134217728}$

$2^{-28} = \frac{1}{268435456}$

$2^{-29} = \frac{1}{536870912}$

$2^{-30} = \frac{1}{1073741824}$

$2^{-31} = \frac{1}{2147483648}$

$2^{-32} = \frac{1}{4294967296}$

$2^{-33} = \frac{1}{8589934592}$

$2^{-34} = \frac{1}{17179869184}$

$2^{-35} = \frac{1}{34359738368}$

$2^{-36} = \frac{1}{68719476736}$

$2^{-37} = \frac{1}{137438953472}$

$2^{-38} = \frac{1}{274877906944}$

$2^{-39} = \frac{1}{549755813888}$

$2^{-40} = \frac{1}{1099511627776}$

$2^{-41} = \frac{1}{2199023255552}$

$2^{-42} = \frac{1}{4398046511104}$

$2^{-43} = \frac{1}{8796093022208}$

$2^{-44} = \frac{1}{17592186044416}$

$2^{-45} = \frac{1}{35184372088832}$

$2^{-46} = \frac{1}{70368744177664}$

$2^{-47} = \frac{1}{140737488355328}$

$2^{-48} = \frac{1}{281474976710656}$

$2^{-49} = \frac{1}{562949953421312}$

$2^{-50} = \frac{1}{1125899906842624}$

$2^{-51} = \frac{1}{2251799813685248}$

$2^{-52} = \frac{1}{4503599627370496}$

$2^{-53} = \frac{1}{9007199254740992}$

$2^{-54} = \frac{1}{18014398509481984}$

$2^{-55} = \frac{1}{36028797018963968}$

$2^{-56} = \frac{1}{72057594037927936}$

$2^{-57} = \frac{1}{144115188075855872}$

$2^{-58} = \frac{1}{288230376151711744}$

$2^{-59} = \frac{1}{576460752303423488}$

$2^{-60} = \frac{1}{1152921504606846976}$

$2^{-61} = \frac{1}{2305843009213693952}$

$2^{-62} = \frac{1}{4611686018427387904}$

$2^{-63} = \frac{1}{9223372036854775808}$

$2^{-64} = \frac{1}{18446744073709551616}$

$2^{-65} = \frac{1}{36893488147419103232}$

$2^{-66} = \frac{1}{73786976294838206464}$

$2^{-67} = \frac{1}{147573952589676412928}$

$2^{-68} = \frac{1}{295147905179352825856}$

$2^{-69} = \frac{1}{590295810358705651712}$

$2^{-70} = \frac{1}{1180591620717411303424}$

$2^{-71} = \frac{1}{2361183241434822606848}$

$2^{-72} = \frac{1}{4722366482869645213696}$

$2^{-73} = \frac{1}{9444732965739290427392}$

$2^{-74} = \frac{1}{18889465931478580854784}$

$2^{-75} = \frac{1}{37778931862957161689568}$

$2^{-76} = \frac{1}{75557863725914323379136}$

$2^{-77} = \frac{1}{151115727451828646758272}$

$2^{-78} = \frac{1}{302231454903657293516544}$

$2^{-79} = \frac{1}{604462909807314587033088}$

$2^{-80} = \frac{1}{1208925819614629174066176}$

$2^{-81} = \frac{1}{2417851639229258348132352}$

$2^{-82} = \frac{1}{4835703278458516696264704}$

$2^{-83} = \frac{1}{9671406556917033392529408}$

$2^{-84} = \frac{1}{19342813113834066785058816}$

$2^{-85} = \frac{1}{38685626227668133570117632}$

$2^{-86} = \frac{1}{77371252455336267140235264}$

$2^{-87} = \frac{1}{154742504910672534280470528}$

$2^{-88} = \frac{1}{309485009821345068560941056}$

$2^{-89} = \frac{1}{618970019642690137121882112}$

$2^{-90} = \frac{1}{1237940039285380274243764224}$

$2^{-91} = \frac{1}{2475880078570760548487528448}$

$2^{-92} = \frac{1}{4951760157141521096975056896}$

$2^{-93} = \frac{1}{9903520314283042193950113792}$

$2^{-94} = \frac{1}{19807040628566084387900227584}$

$2^{-95} = \frac{1}{39614081257132168775800455168}$

$2^{-96} = \frac{1}{79228162514264337551600910336}$

$2^{-97} = \frac{1}{158456325228528675103201820672}$

$2^{-98} = \frac{1}{316912650457057350206403641344}$

$2^{-99} = \frac{1}{633825300914114700412807282688}$

$2^{-100} = \frac{1}{1267650601828229400825614565376}$

$2^{-101} = \frac{1}{2535301203656458801651229130752}$

$2^{-102} = \frac{1}{5070602407312917603202458261504}$

$2^{-103} = \frac{1}{10141204814625835206404916523008}$

$2^{-104} = \frac{1}{20282409629251670412809833046016}$

$2^{-105} = \frac{1}{40564819258503340825619666092032}$

$2^{-106} = \frac{1}{81129638517006681651239332184064}$

$2^{-107} = \frac{1}{162259277034013363202478664368128}$

$2^{-108} = \frac{1}{324518554068026726404957328736256}$

$2^{-109} = \frac{1}{649037108136053452809914657472512}$

$2^{-110} = \frac{1}{1298074216272106905619829314945024}$

$2^{-111} = \frac{1}{2596148432544213811239658629890048}$

$2^{-112} = \frac{1}{5192296865088427622479317259780096}$

$2^{-113} = \frac{1}{10384593730176855244958634519560192}$

$2^{-114} = \frac{1}{20769187460353710489917269038120384}$

$2^{-115} = \frac{1}{41538374920707420979834538076240768}$

$2^{-116} = \frac{1}{83076749841414841959669076152481536}$

$2^{-117} = \frac{1}{166153497682829683919338152304963072}$

$2^{-118} = \frac{1}{332306995365659367838676304609926144}$

$2^{-119} = \frac{1}{664613990731318735677352609219852288}$

$2^{-120} = \frac{1}{1329227981462637471354705218439705576}$

$2^{-121} = \frac{1}{2658455962925274942709410436879411152}$

$2^{-122} = \frac{1}{5316911925850549885418820873758822208}$

$2^{-123} = \frac{1}{10633823851701099770837641747517644016}$

$2^{-124} = \frac{1}{21267647703402199541675283495035288032}$

$2^{-125} = \frac{1}{42535295406804399083350566990070576064}$

$2^{-126} = \frac{1}{85070590813608798166701133980141152128}$

$2^{-127} = \frac{1}{170141181627217596333402267960282304256}$

$2^{-128} = \frac{1}{340282363254435192666804535920564608512}$

$2^{-129} = \frac{1}{680564726508870385333608571841129216024}$

$2^{-130} = \frac{1}{1361129453017740770667217143682258432048}$

$2^{-131} = \frac{1}{2722258906035481541334434287364516864096}$

$2^{-132} = \frac{1}{5444517812070963082668868574729033728192}$

$2^{-133} = \frac{1}{10889035624141926165337737149458067456384}$

$2^{-134} = \frac{1}{21778071248283852330675474298916134912768}$

$2^{-135} = \frac{1}{43556142496567704661350948597832269825536}$

$2^{-136} = \frac{1}{87112284993135409322701897195664539651072}$

$2^{-137} = \frac{1}{174224569986270818645403794391329079302144}$

$2^{-138} = \frac{1}{348449139972541637290807588782658158604288}$

$2^{-139} = \frac{1}{696898279945083274581615177565316317208576}$

$2^{-140} = \frac{1}{1393796559890166549163230355130632634417536}$

$2^{-141} = \frac{1}{278759311978033309832646071026126526883512}$

$2^{-142} = \frac{1}{557518623956066619665292142052253053767024}$



Given below are two statements:

**Statement I:**  $(43.25)_{10} = (101011.01)_2$

**Statement II:**  $(1110.111)_2 = (14.625)_{10}$

In the light of the above statements, choose the correct answer from the options given below:

- Both Statement I and Statement II are true
- Both Statement I and Statement II are false
- Statement I is true but Statement II is false
- Statement I is false but Statement II is true





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**Statement I:**  $(43.25)_{10} = (101011.01)_2$

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- (c) **Statement I is true but Statement II is false**
- (d) Statement I is false but Statement II is true



**Tina has bought a 4 gigabyte MP3 player. If each song lasts 3 minutes and is recorded at 128 kilo bits per second, then how many songs can be stored on Tina's MP3 player?**

- (a) 1156      (b) 1256      (c) 1356

- (d) 1456

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- (a) 1156      (b) 1256      (c) 1356      (d) 1456

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### Storage capacity of Tina's MP3 player:

- The storage capacity of Tina's MP3 player is 4 gigabytes.
- $1 \text{ gigabyte} = 8 * 1024 * 1024 \text{ Kilo bits}$  So,  $4 \text{ gigabytes} = 4 * 8 * 1024 * 1024 = 33554432 \text{ kilobits}$

### Size of each song:

- The bitrate of each song is 128 kilo bits per second.
- This means that each second of the song takes up 128 kilo bits of storage space.
- A minute is equal to 60 seconds, so a song that lasts 3 minutes takes up  $128 * 180 = 23040$  bits of storage space.

### Number of songs that can be stored on Tina's MP3 player:

- The number of songs that can be stored on Tina's MP3 player is the total storage capacity of the MP3 player divided by the size of each song.
- $33554432 / 23040 = 1456$  songs.



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