

 <p><b>NPR</b> Reach the Star</p>	<p align="center"><b>NPR College of Engineering &amp; Technology</b>          NPR Nagar, Natham, Dindigul - 624401, Tamil Nadu, India.          Approved by AICTE, New Delhi &amp; Affiliated to Anna University, Chennai.          An ISO 9001:2015 Certified Institution.          Phone No: 04544- 246 500, 246501, 246502.          Website : www.nprcolleges.org, www.nprcet.org, Email:nprcetprincipal@nprcolleges.org</p>	
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**CRITERION 2 TEACHING – LEARNING AND EVALUATION**

**KEY INDICATOR 2.2 CATERING TO STUDENT DIVERSITY**

**Metric No 2.2.1 The institution assesses the learning levels of the students and organises special Programmes for advanced learners and slow learners**

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 Principal  
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 <p><b>NPR</b> Nagar, Natham</p>	<p><b>NPR College of Engineering &amp; Technology</b> NPR Nagar, Natham, Dindigul - 624401, Tamil Nadu, India Approved by AICTE New Delhi &amp; Affiliated to Anna University, Chennai An ISO 9001:2015 Certified Institution Phone No - 04544- 246 500, 246501, 246502 Website - <a href="http://www.nprcolleges.org">www.nprcolleges.org</a>, <a href="http://www.nprcet.org">www.nprcet.org</a>, Email <a href="mailto:nprcetprincipal@nprcolleges.org">nprcetprincipal@nprcolleges.org</a></p>	
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## NPR COLLEGE OF ENGINEERING AND TECHNOLOGY



### VISION

To develop students with intellectual curiosity and technical expertise to meet the global needs.

### MISSION

- To achieve academic excellence by offering quality technical education using best teaching techniques.
- To improve Industry – Institute interactions and expose industrial atmosphere.
- To develop interpersonal skills along with value based education in a dynamic learning environment.
- To explore solutions for real time problems in the society.





## **POLICY ON SLOW LEARNERS AND ADVANCED LEARNERS**

This policy paper is conceded as the “Policy on Slow Learners and Advanced Learners” of NPR College of Engineering and Technology, Natham , Dindigul. By virtue of this Policy the College pronounces its assurance to the proper counsel for the enhancement of the slow learners to be better on their way of academic and personal life and advanced learners to be extraordinary in the academic and other extracurricular activities.

### **Categorization of New Budding Engineers**

We organized bridge course to familiarize the basic fundamentals and we also conducted one day Motivational Program for all the new budding engineers to expose the opportunities available in the field of Engineering.

The Students belonging to first years are taxonomies as Tamil Medium Students / Poor Cut off marks in XII Standard / Poor Knowledge in computing skills.

The purpose of assessment of the learning levels of the students and conduction of activities for them is to help them out for improvement in their academics.

### **Methods to identify Advanced Learners and Slow Learners**

Each and Every faculty must deal with different categories of students; some are very intelligent who learn very fast and some are quite weak who learn very slowly. Therefore, it is required to determine the abilities of the students in the class. Based on the ability determined, some students need only guidance and some students need a hard work and regular attention.

A good teaching methodology helps a lot to make either an advanced learner to get more connected with the class or a slow learner he/she may not get away from the concentration.

A student may have his/her own way of getting knowledge and standing with what they had learnt. It varies from one to the other.

1. To validate a student’s capacity he/she will assessed by daily class tests, internal exam and practical sessions as a whole right from first to the final year, which will be taken for grading their internal marks as well.



2. Slow learner and advanced learners would be identified for each subject separately by respective faculty members for all the semesters.

3. The student as an individual is identified as Advanced learners if he/she scores equal to or greater than 60% [ $\geq 60\%$ ] of marks in his/her internal exams and the students scored less than 60% [ $< 60\%$ ] are identified as Slow learners.

### SLOW LEARNERS

The slow learners are always lagging in academic performance. They may fail in exams or score poor marks. They need more attention towards their studies to enhance and endure their level of grade.

#### Methodologies to Support Slow Learners

- Remedial are conducted with appropriate focus on the subject/topic codes in which the students are found to be slow learners
- Individual academic counseling is done by concerned subject faculty.

#### POLICY GUIDELINES FOR SLOW LEARNERS

- Remedial Course for slow learners, absentees and students involved in sports activities which help slow learners to improve subject knowledge with the result of catching up with their peers.
  - Bridge Course for first year students.
  - Orientation and Induction Programme at College and departmental level for fresher's.
  - Conduct additional classes for the difficult subjects (based on the previous semester university results) in the curriculum.
  - Special attention is given to the students in the remedial classes, who are identified as the slow learners.
  - Slow learners are specially advised and counseled by a staff mentor and the subject expert.
  - The students are given with training on communication skills, personality development, time management and motivational sessions.
  - Academic and personal counseling are given to the slow learners by the mentor.





- Bilingual explanation and discussions are imparted to the slow learners after the class hours for better understanding.
- Provision of simple and standard lecture notes/course materials and special preparation for the exams will be good.
- Getting the support of the advanced learners to the slow learners in making their learning process more participatory and interesting.
- Encouraging the group learning activities and practical will be useful to the slow learners.

### ADVANCED LEARNERS

The Advanced learners are those who can grab concepts faster than others and can make best outputs on various tests they go through. They take into themselves greater responsibilities, by showing interests on both Academic and extracurricular activities.

#### Methodology to encourage Advanced Learners

1. Advanced learners are motivated to strive for higher goals. They are encouraged to organize as well as to participate in Symposium, Workshop, various technical competitions and Seminar to gain Knowledge.
2. Helping them to participate in group discussions, technical quizzes to develop analytical and problem solving abilities in them and thereby, to improve their presentation skills.
3. Regular Motivation is given to the students to prepare for the Placement, Competitive Exams and Entrepreneurship.

#### POLICY GUIDELINES FOR ADVANCED LEARNERS

- ✓ Advanced learners are motivated to strive for higher goals. They are provided with additional inputs for better career planning and growth through offering special coaching for higher level competitive examinations
- ✓ Encouragement to identify and utilize the web learning resources
- ✓ Motivation to participate in interactive activities like debates, group discussion on and out of the syllabi contents and participation in various cultural, extra-curricular and research competitions in and out of the college.
- ✓ To provide need based facility in departments and library to advanced learners.





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- ✓ Personal Counseling as and when the students turn up for the guidance
- ✓ Arrangement of Guest lectures.
- ✓ Students enrolled into SWAYAM Courses
- ✓ Students are engaged in ICT enabled teaching learning and LMS with considerable responses.
- ✓ They are made the supporters to the average and the slow learners.

**Dr. J.SUNDARARAJAN,**

B.E., M.Tech., Ph.D.,

Principal

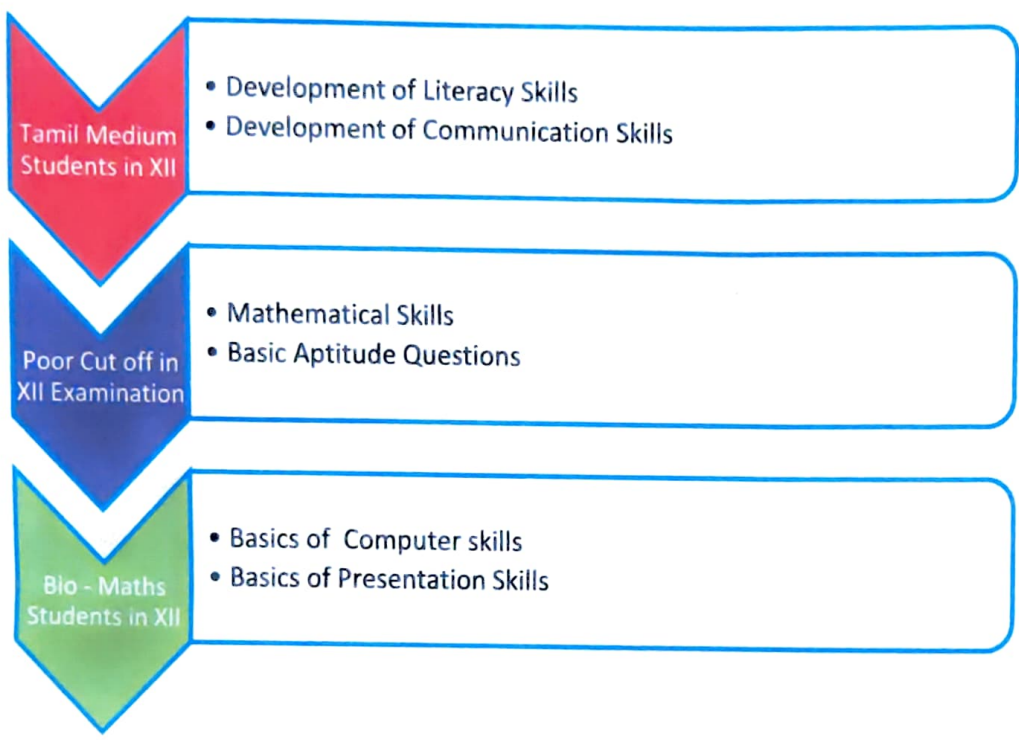
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**DEPARTMENT OF SCIENCE AND HUMANITIES**  
**CATEGORIZATION OF NEW BUDDING ENGINEERS**



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Ref: NPRCET/S&H /Coaching/2020 -2021

20.11.2020

### CIRCULAR

The Special coaching classes will be conducted for the first year students those who have from Tamil medium, Biology students and those who are poor in Mathematics subject in XII Standard on 23.11.2020 to 25.11.2020 through online platform. The students are advised to make use of this special coaching classes successfully. The Classes handling faculty list, department wise students Name list and Time Table will be sent through E-mail or Whatsapp.

  
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Copy to

1. Department of S&H
2. Department of CSE
3. Students Whatsapp Group
4. Faculty Whatsapp Group
5. Notice board.





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**DEPARTMENT OF SCIENCE AND HUMANITIES**  
**THE FACULTY NAME LIST FOR THE SPECIAL COACHING CLASSES**

S. NO	NAME OF THE FACULTY	SUBJECT
1	1. Mrs. V. Sujitha, AP/CSE 2. Mrs. J. Prisca Mary, AP/CSE 3. Mrs. C. Kalpana. AP/CSE	Basic Computer Skills & Basic Programming Languages.
2.	1. Mrs. A. Kanimozhi, Asso. Prof/Maths 2. Mr. U. Vijayanarayanan, AP/ Maths 3. Mr. P. Madasamy, AP/Maths	Basic Mathematical Skills and Aptitude.
3.	1. Mrs. K. Kavitha, AP/English 2. Ms. R. Sindhu, AP/ English 3. Ms. S. Suganya, AP/English	Development of Literacy and Communication Skills.

*[Signature]*  
HOD

*[Signature]*  
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## DEPARTMENT OF SCIENCE & HUMANITIES (2020 - 2021)

### ENGLISH COACHING CLASS

### DEVELOPMENT OF LITERACY & COMMUNICATION SKILLS

#### SYLLABUS

- Listen to simple conversations in everyday contexts and respond.
- Practice production of stress, intonation and problem sounds.
- Listen to lectures, presentations and other suitable listening materials from electronic media, and take notes .
- Listen to telephone calls and respond; keep notes while listening.
- Use conversation starters: introducing oneself; introducing others; small talk: family, friends, hobbies, profession, studies etc.
- Pronunciation practice: Stress and syllables; word stress; contracted forms; utterance stress; uses of a dictionary for pronunciation practice.
- Congratulate people on their success, Apologize.
- Skimming through reading texts and determine two or more main ideas or themes.
- Scanning through reading texts to understand and explain how key details support the main ideas or themes.





## DEPARTMENT OF SCIENCE & HUMANITIES (2020 - 2021)

### ENGLISH COACHING CLASS

#### BASIC MATHEMATICAL SKILLS AND APTITUDE

#### SYLLABUS

- Matrices, Vector Algebra and Partial Fractions Basic needs of matrices - Physical interpretation of matrices - Types of matrices - Operations on matrices.
- Properties of matrices - Determinants - Relation between matrices and determinants - Properties of determinants.
- Representation of vectors - Physical interpretation of vectors - Types of vectors - Operation on vectors - Direction ratios and direction cosines.
- Applications of partial fractions - Importance of partial fractions - Types.
- Differential Calculus Limits and continuity - Concepts of continuity - Derivatives of a function - Differentiation rules - Derivatives of trigonometric function. Chain rule - Techniques of differentiation - Total and partial derivatives. (2 Hours) Theory of equations - Relation between roots and coefficients - Expressions - Equations and factors.
- Integral Calculus Applications of integration - Definite and indefinite integrals - Proper and improper integrals - Techniques of integration.
- Integration by substitution - Integration by parts - Bernaulli's formula (2 Hours) Integration by using partial fractions.
- Differential Equations ODE - PDE - Applications of ODE & PDE - Formation of ODE & PDE Order - Degree - Need of differential equations & importance.



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**DEPARTMENT OF SCIENCE & HUMANITIES**  
**BASICS OF COMPUTER SKILLS & PRESENTATION SKILLS**  
**(FOR BIOLOGY STUDENTS)**

**SYLLABUS**

**CHAPTER- 1.** Knowing computer: What is Computer, Basic Applications of Computer; Components of Computer System, Central Processing Unit (CPU), VDU, Keyboard and Mouse, Other input/output Devices, Computer Memory, Concepts of Hardware and Software; Concept of Computing, Data and Information; Applications of IECT; Connecting keyboard, mouse, monitor and printer to CPU and checking power supply.

**CHAPTER - 2.** Word Processing Basics; Opening and Closing of documents; Text creation and Manipulation; Formatting of text; Table handling; Spell check, language setting and thesaurus; Printing of word document.

**CHAPTER - 3** Making Small Presentation: Basics of presentation software; Creating Presentation; Preparation and Presentation of Slides; Slide Show; Taking printouts of presentation / handouts.





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## DEPARTMENT OF SCIENCE & HUMANITIES SPECIAL COACHING CLASS FOR FIRST YEAR 2020-2021 DEVELOPMENT OF LITERACY & COMMUNICATION SKILLS TIME TABLE

Period	1		2	3	4		5	6		7	8
Hour →	09.00 to 09:50	9.50 to 10.15	10.15 to 11.05	11.05 to 11.55	11.55 to 12.45	12.45 to 1.20	01.20 to 2.05	02.05 to 02.50	02.50 to 3.00	3.00 to 03.45	03.45 to 04.30
23.11.2020	K.K	BREAK	K. K	R. S		LUNCH	S. S		BREAK	K.K	
24.11.2020	R.S		R.S	S. S			K. K			R.S	
25.11.2020	S.S		S. S	K. K			R.S			S.S	

Subject Name	Faculty	
Development Of Literacy & Communication Skills	1. Mrs. K. Kavitha	K. K
	2. Ms. R. Sindhu	R S
	3. Ms. S. Suganya	S. S

TIME TABLE INCHARGE

(D. Loganathan)



HOD  
(Mrs. P. R. S. S. S.)

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**DEPARTMENT OF SCIENCE & HUMANITIES**  
**SPECIAL COACHING CLASS FOR FIRST YEAR 2020-2021**  
**BASIC COMPUTER SKILLS AND BASIC PROGRAMMING LANGUAGES**

**TIME TABLE**

Period	1		2	3	4		5	6		7	8
Hour →	09.00 to 09:50	9.50 to 10.15	10.15 to 11.05	11.05 to 11.55	11.55 to 12.45	12.45 to 1.20	01.20 to 2.05	02.05 to 02.50	2.50 to 3.00	3.00 to 03.45	03.45 to 04.30
23.11.2020	V. S	<b>BREAK</b>	V. S	J. PM		<b>LUNCH</b>	J. B		<b>BREAK</b>	V. S	
24.11.2020	J. PM		J. PM	J. B			V. S			J. PM	
25.11.2020	J. B		J. B	V.S			J. PM			J. B	

Subject Name	Faculty
Basic Computer Skills And Basic Programming Languages	1. Mrs. V. Sujitha. V.S
	2. Mrs. J. Prisca Mary J.PM
	3. Mrs. C. Kalpana J. B

**TIME TABLE INCHARGE**

(A. LAKSHMI)



*[Signature]*  
**HOD**

(Dr. P. R. Jayaraj)

*[Signature]*

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**DEPARTMENT OF SCIENCE & HUMANITIES**  
**SPECIAL COACHING CLASS FOR FIRST YEAR 2020-2021**  
**BASIC MATHEMATICAL SKILLS AND APTITUDE**  
**TIME TABLE**

Period	1		2	3	4		5	6		7	8
Hour →	09.00 to 09:50	9.50 to 10.15	10.15 to 11.05	11.05 to 11.55	11.55 to 12.45	12.45 to 1.20	01.20 to 2.05	02.05 to 02.50	02.50 to 3.00	3.00 to 03.45	03.45 to 04.30
23.11.2020	A.K	<b>BREAK</b>	A.K	U.VN		<b>LUNCH</b>	P.M		<b>BREAK</b>	A.K	
24.11.2020	U.VN		U.VN	P.M			A.K			U.VN	
25.11.2020	P.M		P.M	A,K			U.VN			P.M	

Subject Name	Faculty	
Basic Mathematical Skills And Aptitude	1. Mrs. A. Kanimozhi	A.K
	2. Mr. U. Vijayanarayanan	U.VN
	3. Mr. P. Madasamy	P.M

**TIME TABLE INCHARGE**

(A. Kanimozhi)



**HOD**

(Dr. J. Sundararajan)

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## DEPARTMENT OF SCIENCE & HUMANITIES (2020-2021)

### DEVELOPMENT OF LITERACY & COMMUNICATION SKILLS

#### STUDENTS ATTENDANCE

Branch: CIVIL

S.No	Name	23.11.2020	24.11.2020	25.11.2020
1	Mohanraj. G	/	/	/
2	Chandramoorthi. B	a	/	/
3	Suriya. M	/	/	a
4	Harish. M	/	a	/

Branch: CSE

S.No	Name	23.11.2020	24.11.2020	25.11.2020
1	M. Venkatraman	/	/	/
2	N. Praveen	a	/	/
3	V. Madhivanan	/	/	/
4	K. Kabilesh	/	a	/
5	A.Vinoth	/	/	/
6	D. Sivamanivignesh	/	/	/
7	A.Abinaya	a	/	/
8	A. Rampriya	/	/	/
9	N. Ponnalagu	/	/	/
10	M. Muthulakshmi	/	/	a
11	Leo. T	a	/	/
12	K. Naveen	/	/	/
13	Yuvaneshkumar K	/	/	/

Branch: EEE

S.No	Name	23.11.2020	24.11.2020	25.11.2020
1	Saravanakumar. S	/	/	/
2	Jayaram. M	a	/	/
3	Ramar. V	/	/	/
4	Harish. G	/	/	a
5	Justin Thiraviyam A	/	/	/
6	Lokesh Kumar. M	/	a	/
7	Mahendra. S	/	/	/
8	Thavamani. A	/	/	/
9	Bharathiraja. C	/	/	/
10	Venkatesh. V	/	/	/





Branch: ECE

S.No	Name	23.11.2020	24.11.2020	25.11.2020
1	Harini. C	/	/	/
2	Jeeva. S	/	/	/
3	Maniyammaiyar. N	2	/	/
4	Muneeshwari. L	/	/	/
5	Nandhini. A	/	/	/
6	Praveenkumar. P	/	/	/
7	Ragulraj. R	/	/	/
8	Sanjay Kumar. S	/	/	2
9	Selvakumar. M	/	/	/
10	Sivaranjani. S	/	/	/
11	Dharani. V	/	/	/
12	Vasanthakumar. M	/	2	/
13	Santhini. R	/	/	/
14	Sivaranjani. T	/	/	/
15	Suresh. A	/	/	/

Branch: Mechanical

S.No	Name	23.11.2020	24.11.2020	25.11.2020
1	Ajaykumar B	/	/	/
2	Venkatesan. N	2	/	/
3	Sivabalan. N	/	/	2

  
FACULTY INCHARGE

1. MRS. B. KAVITHA

2. S. SUGANYA - 

3. R. SINDHU - 

  
HOD

  
PRINCIPAL

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**Department of Science & Humanities(2020-2021)**  
**BASIC COMPUTER SKILLS AND BASIC PROGRAMMING LANGUAGES**  
**STUDENTS ATTENDANCE**

**Branch: CIVIL**

S.No	Name	23.11.2020	24.11.2020	25.11.2020
1	SharanSakthivel. J	/	/	/
2	Yazhini	/	/	2
3	AnandhanAlaguvel. P	/	/	/
4	Naveenkumar. S	2	/	/
5	Pranaveshvar. J	/	/	/
6	VijayaSrihari. I	/	2	/
7	Vikneshwaran. S	/	/	/

**Branch: CSE**

S.No	Name	23.11.2020	24.11.2020	25.11.2020
1	K. Harivignesh	/	/	/
2	S. Kaleeshwaran	/	/	/
3	P. Saravanapandi	2	/	/
4	A. Kaviyaran	/	/	/
5	R. Rajesh Sharma	/	2	/
6	S. Geethanjali	/	/	/
7	V. Deepika	/	/	/
8	G. Srinithi	/	/	2
9	S. NafeelaNasrin	2	/	/
10	Divya	/	/	/
11	Keerthi	/	/	/
12	Palanikumar	/	/	/
13	Priyadharshini	/	/	/
14	SujitRagav	/	/	2
15	Vijayakumar	2	/	/

**Branch: EEE**

S.No	Name	23.11.2020	24.11.2020	25.11.2020
1	Tharun N	/	/	/
2	IshasAhamed. A	/	/	2
3	Baskar. A	2	/	/





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Branch: ECE

S.No	Name	23.11.2020	24.11.2020	25.11.2020
1	Arthi. M	/	/	/
2	Ajitha. S	/	/	/
3	Harrish. A	/	/	/
4	Jawahar. R	/	/	/
5	LokeshKanna. G	/	/	/
6	Mahavarshini. S	/	/	/
7	Malavika. A	/	/	/
8	MeeraJafrin. A	/	/	/
9	Sandhiya. D	/	/	/
10	Sivaprasad.K	/	/	/
11	Soundharayalakshmi. D	/	/	/
12	SuprajaSuryawanshi.S	/	/	/
13	Udaiyappan. N	/	/	/
14	Archana. P	/	/	/
15	Ariharan. K	/	/	/
16	Hemeshwar. S	/	/	/

Branch: MECHANICAL

S.No	Name	23.11.2020	24.11.2020	25.11.2020
1	Arunkumar. K. E	/	/	/
2	Mohanraj. S	/	/	/
3	Thangavimal. V	/	/	/

### FACULTY INCHARGE

- Mrs. C. KALPANA,  
Ap/CSE
- Mrs. J. PRISCARY  
Ap/CSE
- Mrs. V. SUJITHA  
Ap/CSE

*[Signature]*  
HOD

### PRINCIPAL

**Dr. J.SUNDARARAJAN,**  
B.E., M.Tech., Ph.D.,  
Principal  
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.





**Department of Science & Humanities(2020-2021)**

**BASIC MATHEMATICAL SKILLS AND APTITUDE**

**STUDENTS ATTENDANCE**

**Branch: CIVIL**

S.No	Name	23.11.2020	24.11.2020	25.11.2020
1	Gowtham. C	/	/	/
2	Alagar. K	/	/	/
3	Sundaraprakadeswaran.B	/	/	/

**Branch: CSE**

S.No	Name	23.11.2020	24.11.2020	25.11.2020
1	M. Sripradeep	/	/	/
2	K. Lakshmipathy	/	/	/
3	M. Karthikeyan	/	/	/
4	M. Joshuva Baskaran	/	/	/
5	K. Karthick	/	/	/
6	T. Jeron Robinson	/	/	/
7	G. K. Shabarikanth	/	/	/
8	G. Sudharsan	/	/	/
9	H. Sanjay	/	/	/
10	M. Anandaraj	/	/	/
11	N. Sajithayasmin	/	/	/
12	M. Swathi	/	/	/
13	M. Subbulakshmi	/	/	/
14	S. Salini	/	/	/
15	M. Kowsalya	/	/	/
16	T. Sowmiya	/	/	/
17	K. DharshanaPriya	/	/	/
18	K. Nivetha	/	/	/
19	R. S. Pradeepraj	/	/	/
20	T. Saravanakumar	/	/	/
21	S. Sabarishan	/	/	/
22	S. Tharvinraja	/	/	/

**Branch: EEE**

S.No	Name	23.11.2020	24.11.2020	25.11.2020
1	Mohammed Ashik. S	/	/	/
2	Kabil Sharma. M	/	/	/
3	Saravanamuthu. K	/	/	/
4	Sarvesh. R	/	/	/



5	Jayachandran. P	/	/	/
6	Govindhavasan. A	/	/	/

**Branch: ECE**

S.No	Name	23.11.2020	24.11.2020	25.11.2020
1	Ajay Gowtham. S	/	/	/
2	Akash. S	/	/	/
3	Aravindhan. S	/	/	/
4	Bhavani.R	/	/	/
5	Dhaarini. M.J	/	/	/
6	Hareesh. V	/	/	/
7	Jeffery Albert. J	/	/	/
8	Maheshwari. R	/	/	AB
9	Manoj. S	/	/	/
10	Nivethitha. V	/	/	/
11	Rohith Abraham. J	/	/	/
12	SabeerAhamed. T	/	/	/
13	SaiSankaraNarayana. S	/	/	/
14	Balasakthi. S	/	/	/
15	Mohammed ThoufiqAgarish.R	/	AB	/

**Branch: MECHANICAL**

S.No	Name	23.11.2020	24.11.2020	25.11.2020
1	Abhishekkumar. M	/	/	/
2	Ruban. V	/	/	/
3	Raguram. B	/	/	/
4	Sivakumar. P	/	/	/
5	Sabarinathan. S	/	/	/

**FACULTY INCHARGE**

1. A. KANIMOZH  
AP - MATHS
2. U. VISAYANARAYAN  
AP/MATHS
3. P. MODASAMY  
AP/MATHS

**HOD**

(Dr. J. Priya)

**PRINCIPAL**

**Dr. J.SUNDARARAJAN,**

B.E., M.Tech., Ph.D.,

Principal

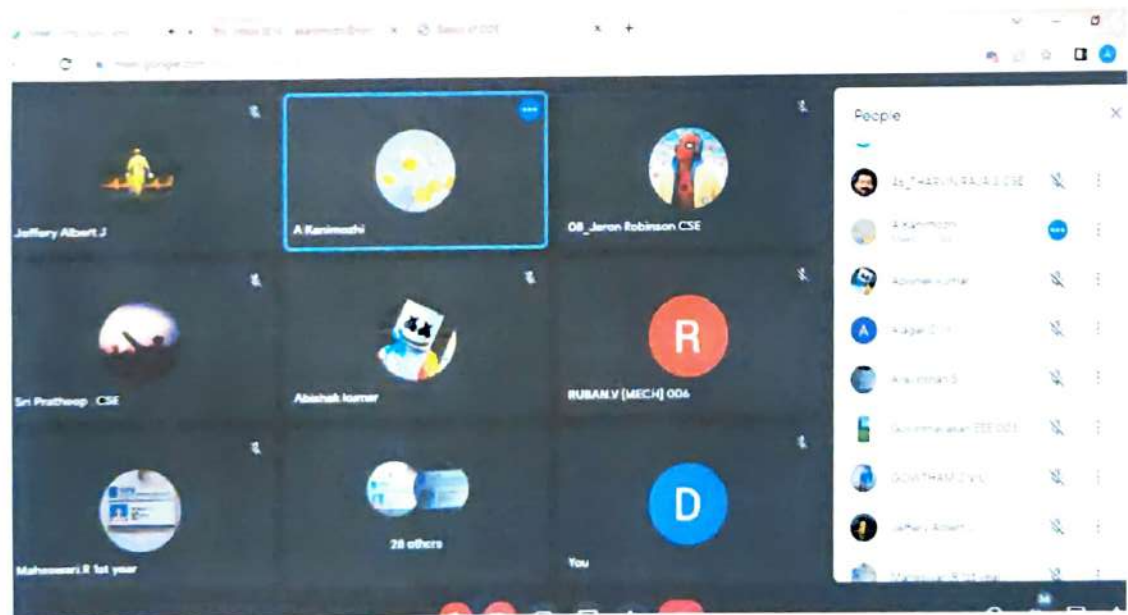
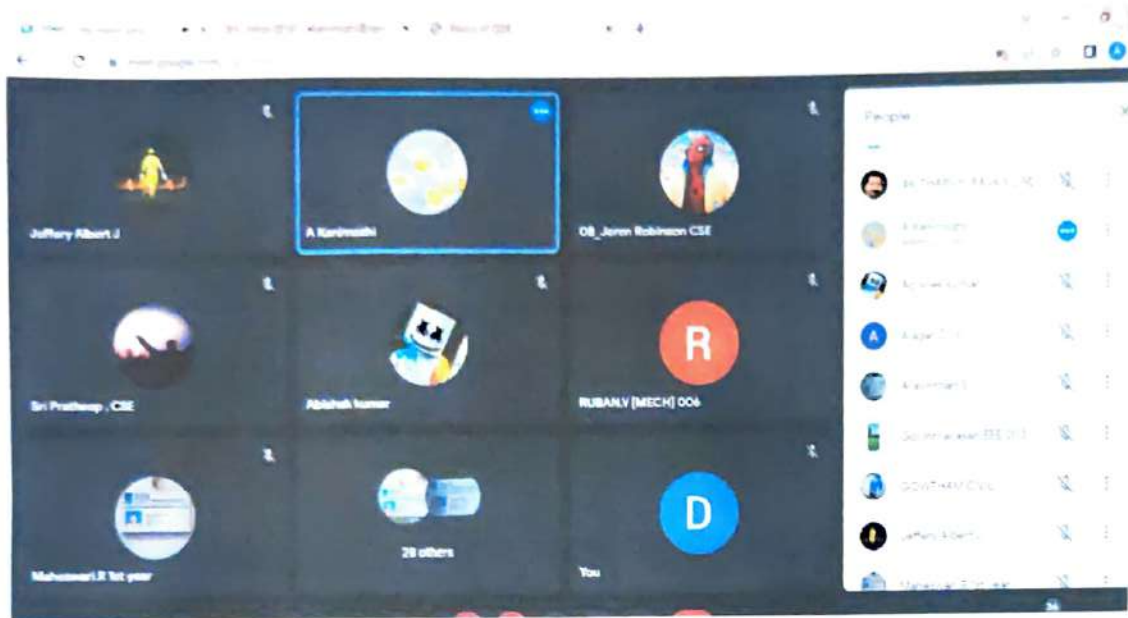
N.P.R. College of Engineering & Technology  
Natham, Dindigul (Dt) - 624 401.





	<h1 style="text-align: center;">NPR College of Engineering &amp; Technology</h1> <p style="text-align: center;">NPR Nagar, Natham, Dindigul - 624401, Tamil Nadu, India.          Approved by AICTE, New Delhi &amp; Affiliated to Anna University, Chennai          An ISO 9001:2015 Certified Institution          Phone No. 04544- 246 500, 246501, 246502          Website: <a href="http://www.nprcolleges.org">www.nprcolleges.org</a>, <a href="http://www.nprcet.org">www.nprcet.org</a>, Email: <a href="mailto:nprcetprincipal@nprcolleges.org">nprcetprincipal@nprcolleges.org</a></p>	
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**DEPARTMENT OF SCIENCE AND HUMANITIES**  
**BRIDGE COURSE MATHEMATICS**

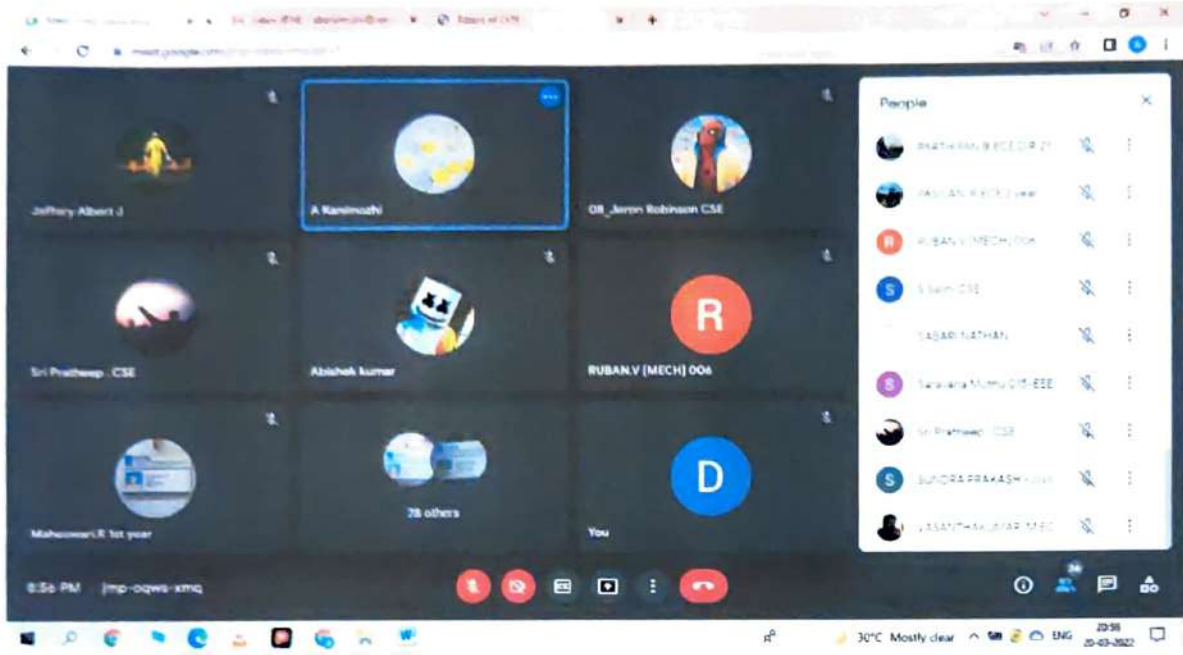


**STUDENTS ATTENDANCE**





	<h1 style="text-align: center;">NPR College of Engineering &amp; Technology</h1> <p style="text-align: center;">NPR Nagar, Natham, Dindigul - 624401, Tamil Nadu, India.          Approved by AICTE, New Delhi &amp; Affiliated to Anna University, Chennai.          An ISO 9001 2015 Certified Institution          Phone No: 04544- 246 500, 246501, 246502.          Website: <a href="http://www.nprcolleges.org">www.nprcolleges.org</a>, <a href="http://www.nprcet.org">www.nprcet.org</a>, Email: <a href="mailto:nprcetprincipal@nprcolleges.org">nprcetprincipal@nprcolleges.org</a></p>	
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## BRIDGE COURSE PRESENTATION ON MATHEMATICS





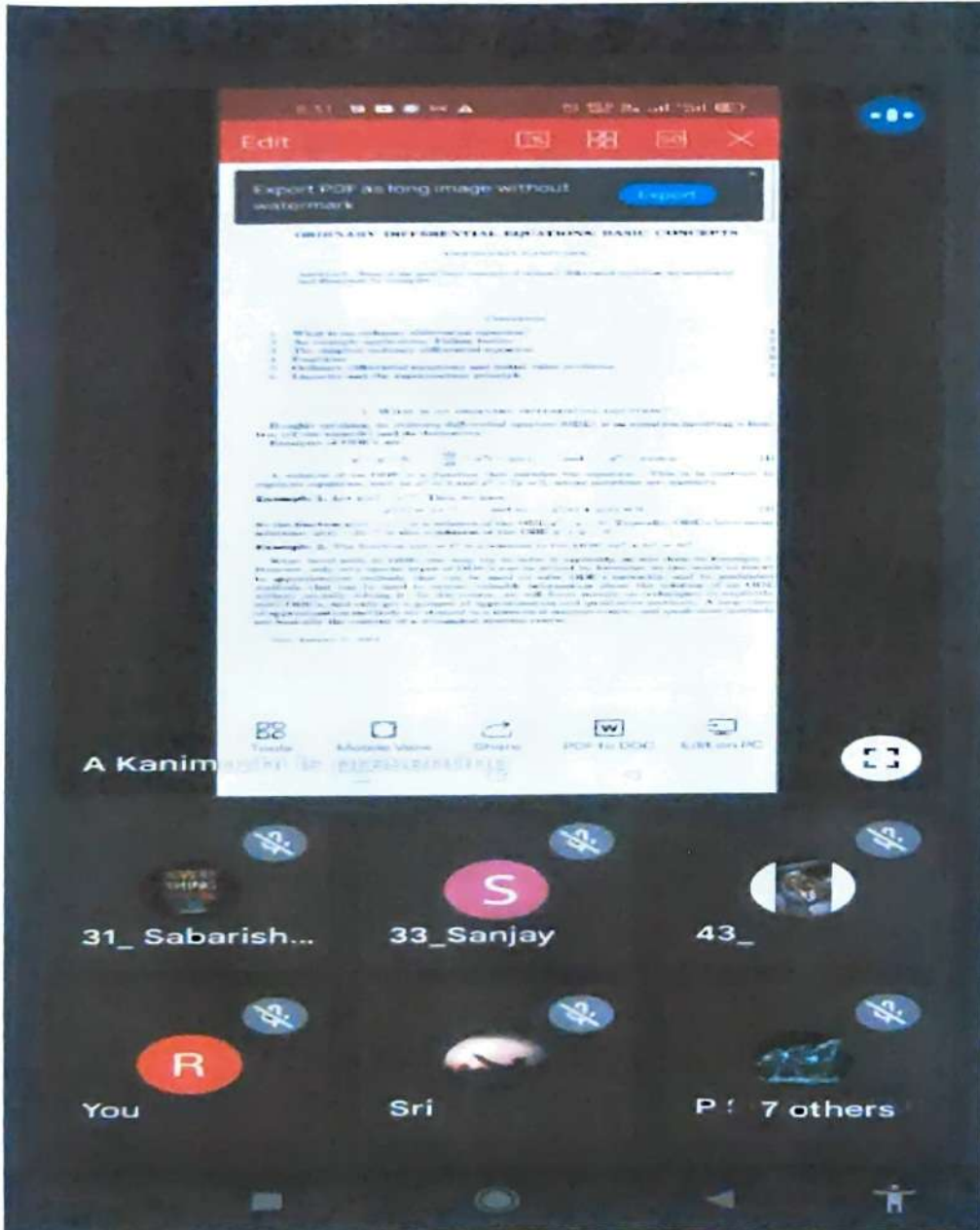
# NPR College of Engineering & Technology

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An ISO 9001:2015 Certified Institution  
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Website: www.nprcolleges.org, www.nprcot.org, Email: nprcotprincipal@nprcolleges.org



## DEPARTMENT OF SCIENCE AND HUMANITIES

### BRIDGE COURSE PRESENTATION ON MATHEMATICS





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Website : [www.nprcolleges.org](http://www.nprcolleges.org), [www.nprcet.org](http://www.nprcet.org), Email [nprcetprincipal@nprcolleges.org](mailto:nprcetprincipal@nprcolleges.org)







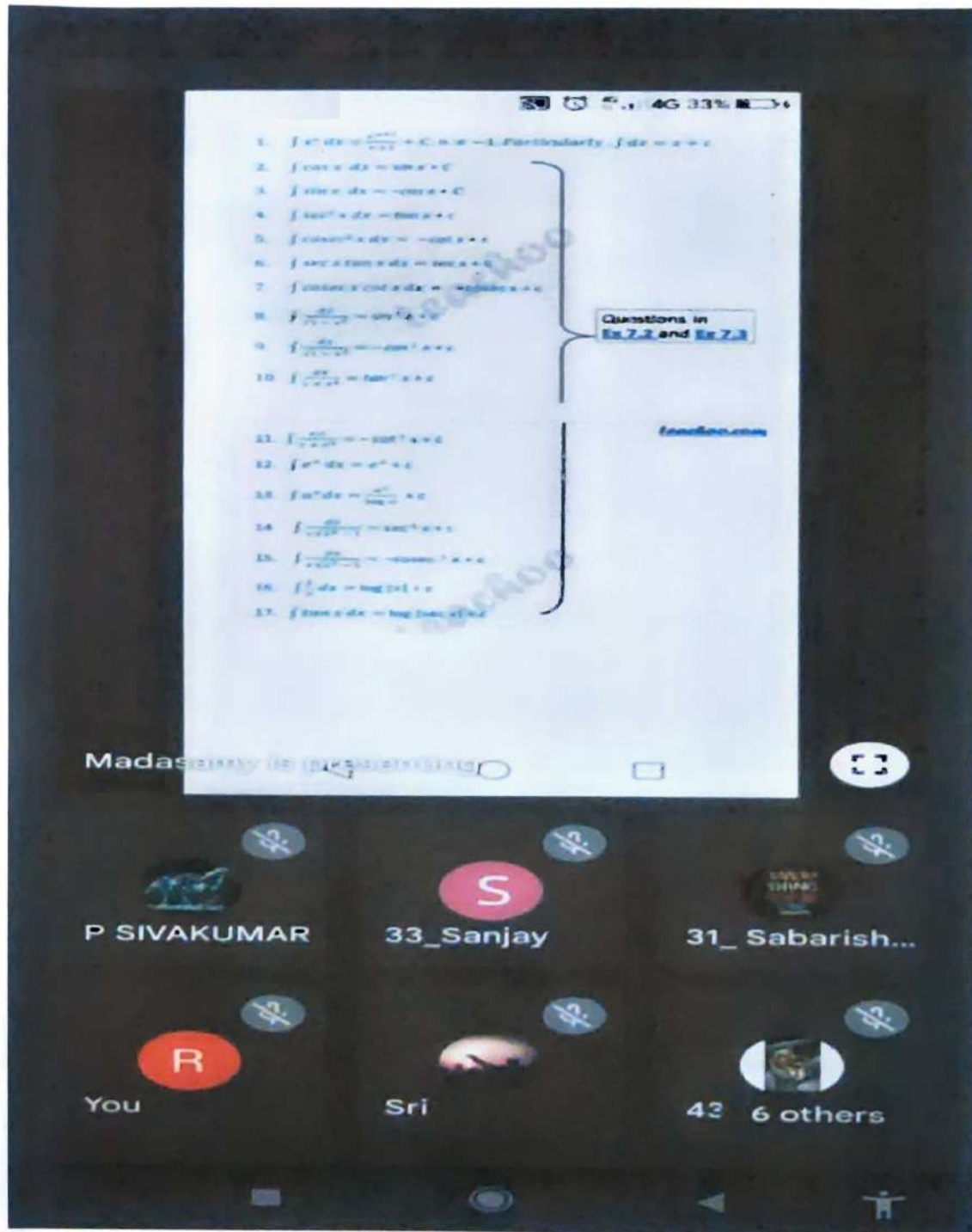
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An ISO 9001:2015 Certified Institution

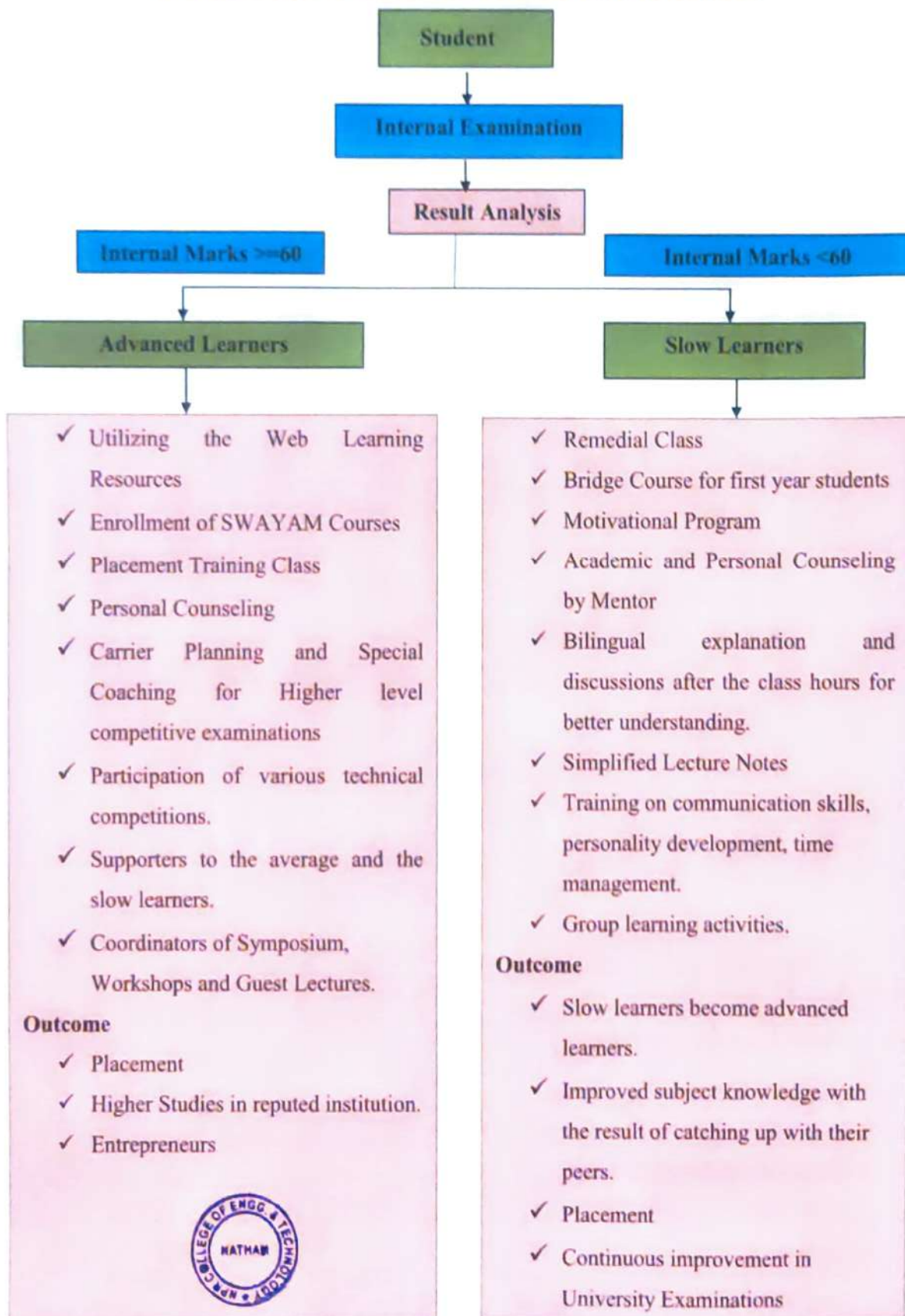
Phone No. 04544- 246 500, 246501, 246502.

Website: www.nprcolleges.org, www.nprcet.org, Email nprcetprincipal@nprcolleges.org





## INSTITUTION ASSESSMENT LEARNING LEVEL




Ref: NPRCET/CSE/REMEDIAL/2020-2021/Odd-01

Date : 07.09.2020

**CIRCULAR**

This is to inform that, Remedial Classes will be conducted for the slow learners of II, III and IV Year of Computer Science and Engineering Students to improve their learning skills and academic performance. The Slow learners were identified based on the performance of the **First Internal Test**. The Students concerned are advised to attend the remedial classes through online mode from 09.09.2020 onwards at 4.30 p.m. to 5.30 p.m. The Remedial Class Schedule will be sent through students' whatsapp group.

  
HoD / CSE

**Head of the Department**  
Department of Computer Science & Engineering  
NPR College of Engineering & Technology  
Natham, Dindigul (DT) - 624 401.

Copy to

1. The Principal
2. Head of the Department Whatsapp group
3. Department Faculty Whatsapp group
4. II,III and IV Year CSE Students Whatsapp group





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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**ACADEMIC YEAR 2020-2021**

**INTERNAL TEST - I REMEDIAL CLASS TIMETABLE FOR SLOW LEARNERS**

**Year / Sem :** II/III

**Batch :** 2019-2023

**Venue :** Google Meet - Online

**Time:** 4.30 p.m. to 5.30 p.m.

Date	Day	Subject Name	Faculty Name
09.09.2020	Wednesday	MA8351 Discrete Mathematics	Mrs. R.Muthukumari
10.09.2020	Thursday	CS8351 Digital Principles and System Design	Prof.G.Elangovan
11.09.2020	Friday	CS8391 Data Structures	Mr.J.Dinesh
14.09.2020	Monday	CS8392 Object Oriented Programming	Mr.D.Nagaraj
15.09.2020	Tuesday	EC8395 Communication Engineering	Mr.S.Sudhakar
16.09.2020	Wednesday	MA8351 Discrete Mathematics	Mrs. R.Muthukumari
17.09.2020	Thursday	CS8351 Digital Principles and System Design	Prof.G.Elangovan
18.09.2020	Friday	CS8391 Data Structures	Mr.J.Dinesh
19.09.2020	Saturday	CS8392 Object Oriented Programming	Mr.D.Nagaraj
21.09.2020	Monday	EC8395 Communication Engineering	Mr.S.Sudhakar
22.09.2020	Tuesday	MA8351 Discrete Mathematics	Mrs. R.Muthukumari

*V. S. S. S.*

**Timetable In-Charge**

*J. H.*  
HoD

**Head of the Department**  
 Department of Computer Science & Engineering  
 NPR College of Engineering & Technology  
 Natham, Dindigul (DT) - 624 401.





**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**ACADEMIC YEAR 2020-2021**

**INTERNAL TEST - I REMEDIAL CLASS TIMETABLE FOR SLOW LEARNERS**

**Year / Sem : III/V**

**Batch : 2018-2022**

**Venue : Google Meet - Online**

**Time: 4.30 p.m. to 5.30 p.m.**

Date	Day	Subject Name	Faculty Name
09.09.2020	Wednesday	MA8551 - Algebra and Number Theory	Ms.S.KanagaLakshmi
10.09.2020	Thursday	CS8591 - Computer Networks	Mrs.R.Ramya
11.09.2020	Friday	EC8691 - Microprocessors and Microcontrollers	Mrs.C.KannikaPrameshwari
14.09.2020	Monday	CS8501 - Theory of Computation	Mrs.C.Kalpana
15.09.2020	Tuesday	CS8592 - Object Oriented Analysis and Design	MrsJ.Prisca Mary
16.09.2020	Wednesday	OIM551 - World Class Manufacturing	Mr.S.Joshua
17.09.2020	Thursday	MA8551 - Algebra and Number Theory	Ms.S.KanagaLakshmi
18.09.2020	Friday	CS8591 - Computer Networks	Mrs.R.Ramya
19.09.2020	Saturday	EC8691 - Microprocessors and Microcontrollers	Mrs.C.KannikaPrameshwari
21.09.2020	Monday	CS8501 - Theory of Computation	Mrs.C.Kalpana
22.09.2020	Tuesday	CS8592 - Object Oriented Analysis and Design	MrsJ.Prisca Mary

*V. S. S. S.*  
**Timetable In-Charge**

*J. H.*  
**HoD**



**Head of the Department**  
 Department of Computer Science & Engineering  
 NPR College of Engineering & Technology  
 Natham, Dindigul (DT) - 624 401.



	<p align="center"><b>NPR College of Engineering &amp; Technology</b>          NPR Nagar, Natham, Dindigul - 624401, Tamil Nadu, India.          Approved by AICTE, New Delhi &amp; Affiliated to Anna University, Chennai.          An ISO 9001:2015 Certified Institution.          Phone No: 04544- 246 500, 246501, 246502.          Website : www.nprcolleges.org, www.nprcet.org, Email nprcetprincipal@nprcolleges.org</p>	
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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**ACADEMIC YEAR 2020-2021**

**INTERNAL TEST - I MARKS**

**Year / Sem :IV/VII**

**Batch : 2017-2021**

**Course Code / Subject Code: C406 /CS8079**

**Subject Name: Human Computer Interaction**

S.No.	REGISTER NUMBER	STUDENT NAME	INTERNAL TEST - I	RETEST	INTERNAL TEST I WEB PORTAL
1	920817104001	AARTHI R	95	-	95
2	920817104002	ABIRAMI M	97	-	97
3	920817104003	AISHWARYA A	96	-	96
4	920817104004	AISHWARYA R	92	-	92
5	920817104005	AISHWARYA R	95	-	95
6	920817104006	AISHWERYA SRI R	98	-	98
7	920817104007	AJITH KUMAR P J K	98	-	98
8	920817104008	ALAGURAJA R	90	-	90
9	920817104009	AMRUTHAA SHREE R	98	-	98
10	920817104010	ARUNKUMAR S	92	-	92
11	920817104011	BONSIYA R	90	-	90
12	920817104012	CHELLAPANDIAN R	92	-	92
13	920817104015	DINESH KUMAR C	92	-	92
14	920817104017	GURUPRABU R	97	-	97
15	920817104018	GURURAJ B	96	-	96
16	920817104017	HARIPRASATH T	50	72	72
17	920817104020	JEGANATHAN R	52	71	71
18	920817104021	KAVIYA B I	96	-	96
19	920817104022	KAVIYARASAN A	91	-	91
20	920817104023	KEERTHANA G	95	-	95
21	920817104024	KODEESWARAN S	55	75	75
22	920817104025	KOUSHIK ROMEL J	90	-	90
23	920817104026	LOGESHWARI S	94	-	94
24	920817104027	MADHUBALA S	92	-	92
25	920817104028	MANOJ K	98	-	98
26	920817104029	MANOJ S	90	-	90
27	920817104030	MANUSHA M	97	-	97
28	920817104032	NAGAJOTHI C	98	-	98
29	920817104034	NATHIPRIYA K	96	-	96
30	920817104035	NATHISHKUMAR R	52	72	72
31	920817104036	NAVIN MANIKANDAN S	95	-	95







**NPR**  
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# NPR College of Engineering & Technology

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32	920817104037	NELSON J	90	-	90
33	920817104038	NITHIS KANNA G	95	-	95
34	920817104039	PARAMESHWARI P	92	-	92
35	920817104040	POOVARASAN M	92	-	92
36	920817104041	POOVENDRAN K	96	-	96
37	920817104042	PRAKASH KUMAR S	53	71	71
38	920817104043	PREETHI A	98	-	98
39	920817104044	RAJADURAI R	92	-	92
40	920817104045	ROFINA BEGAM N	96	-	96
41	920817104046	SANGEERANI P	98	-	98
42	920817104047	SASTIANANDHAN M	51	76	76
43	920817104048	SHARMA A	56	75	75
44	920817104049	SUBASRI S	96	-	96
45	920817104051	VARSHA M	98	-	98
46	920817104052	VIJAYALAKSHMI S	95	-	95
47	920817104053	VIJAYA SHANTHI M	94	-	94
48	920817104055	YOGESH KANNA S	92	-	92

*v. gunt*  
Faculty In charge

*J. P. Thirumala*  
HoD



 <p><b>NPR</b> Reach the Star</p>	<p align="center"><b>NPR College of Engineering &amp; Technology</b>          NPR Nagar, Natham, Dindigul - 624401, Tamil Nadu, India.          Approved by AICTE, New Delhi &amp; Affiliated to Anna University, Chennai.          An ISO 9001:2015 Certified Institution.          Phone No: 04544- 246 500, 246501, 246502.          Website : <a href="http://www.nprcolleges.org">www.nprcolleges.org</a>, <a href="http://www.nprcet.org">www.nprcet.org</a>, Email <a href="mailto:nprcetprincipal@nprcolleges.org">nprcetprincipal@nprcolleges.org</a></p>	
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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**ACADEMIC YEAR 2020-2021**

**NAMELIST FOR ADVANCED LEARNERS – INTERNAL Test I**

**CS8079 – HUMAN COMPUTER INTERACTION**

**Year / Sem: IV/VII**

**Batch: 2017-2021**

S.No.	REGISTER NUMBER	STUDENT NAME
1	920817104001	AARTHI R
2	920817104002	ABIRAMI M
3	920817104003	AISHWARYA A
4	920817104004	AISHWARYA R
5	920817104005	AISHWARYA R
6	920817104006	AISHWERYA SRI R
7	920817104007	AJITH KUMAR P J K
8	920817104008	ALAGURAJA R
9	920817104009	AMRUTHAA SHREE R
10	920817104010	ARUNKUMAR S
11	920817104011	BONSIYA R
12	920817104012	CHELLAPANDIAN R
13	920817104015	DINESH KUMAR C
14	920817104017	GURUPRABU R
15	920817104018	GURURAJ B
16	920817104021	KAVIYA B I
17	920817104022	KAVIYARASAN A
18	920817104023	KEERTHANA G
19	920817104025	KOUSHIK ROMEL J
20	920817104026	LOGESHWARI S
21	920817104027	MADHUBALA S
22	920817104028	MANOJ K
23	920817104029	MANOJ S
24	920817104030	MANUSHA M
25	920817104032	NAGAJOTHI C
26	920817104034	NATHIPRIYA K
27	920817104036	NAVIN MANIKANDAN S
28	920817104037	NELSON J
29	920817104038	NITHIS KANNA G
30	920817104039	PARAMESHWARI P
31	920817104040	POOVARASAN M





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32	920817104041	POOVENDRAN K
33	920817104043	PREETHI A
34	920817104044	RAJADURAI R
35	920817104045	ROFINA BEGAM N
36	920817104046	SANGEERANI P
37	920817104049	SUBASRI S
38	920817104051	VARSHA M
39	920817104052	VIJAYALAKSHMI S
40	920817104053	VIJAYA SHANTHI M
41	920817104055	YOGESH KANNA S

*nsf*

Faculty In charge

*JK*  
HoD





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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**ACADEMIC YEAR 2020-2021**

**NAMELIST FOR SLOW LEARNERS – INTERNAL TEST I**

**CS8079 – HUMAN COMPUTER INTERACTION**

**Year / Sem: IV/VII**



**Batch: 2017-2021**

S.No.	REGISTER NUMBER	STUDENT NAME
1	920817104017	HARIPRASATH T
2	920817104020	JEGANATHAN R
3	920817104024	KODEESWARAN S
4	920817104035	NATHISHKUMAR R
5	920817104042	PRAKASH KUMAR S
6	920817104047	SASTIANANDHAN M
7	920817104048	SHARMA A

*N. Suf*  
**Faculty In charge**

*[Signature]*  
**HoD**



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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**ACADEMIC YEAR 2020-2021**


**ATTENDANCE FOR SLOW LEARNERS – INTERNAL TEST – I**


**CS8079 – HUMAN COMPUTER INTERACTION**

**Year / Sem: IV/VII**

**Batch :2017-2021**

S.No.	REGISTER NUMBER	STUDENT NAME	16.09.2020
1	920817104017	HARIPRASATH T	a
2	920817104020	JEGANATHAN R	/
3	920817104024	KODEESWARAN S	a
4	920817104035	NATHISHKUMAR R	/
5	920817104042	PRAKASH KUMAR S	/
6	920817104047	SASTIANANDHAN M	/
7	920817104048	SHARMA A	a

DETAILS OF THE TOPIC COVERED			
SI NO	Name of the Faculty	No of times subject handled	Signature of the Faculty
1	Mrs. V.Sujitha	02	
SI NO	TOPICS COVERED DURING COACHING CLASS		
1	Unit 3 -Communication and collaboration models		
2	Unit 4 - Mobile information architecture		

  
**Faculty In charge**

  
**HoD**





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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**  
**REMEDIAL CLASSES & IMPLEMENTATION**



**PROGRAMME : COMPUTER SCIENCE**

**SEMESTER : VII**

<b>REMEDIAL CLASSES</b>	
Subject	<b>HUMAN COMPUTER INTERACTION (CS8079/C406)</b>
Class Involved	Semester 7
Faculty in-charge	Mrs. V.Sujitha
Reason for arranging the remedial Class	Weak students identified after Internal test I
Contents to be Taught	Unit 3,4
Date and venue of the Class	16.09.2020& Google Meet
Faculty to ensure the Class Room is free and the teaching aids are arranged for the Class	Yes
Information to all Students of the Class	Yes
HOD To Ensure there are no other Classes for the students involved on this Date/Time	No other classes
Approved by HOD	
<b>REMEDIAL CLASSES IMPLEMENTATION</b>	
% Attendance of the REMEDIAL Class	57%.
Attendance details is forwarded to HOD	Yes
Verification by HOD	





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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**ACADEMIC YEAR 2020-2021**

**UNIVERSITY MARKS**

**Year / Sem :IV/VII**

**Batch : 2017-2021**

**Course Code / Subject Code:C406 /CS8079**

**Subject Name: Human Computer Interaction**

S.No.	Register Number	Name	Grade	Grade Points
1	920817104001	AARTHI R	A+	9
2	920817104002	ABIRAMI M	B	6
3	920817104003	AISHWARYA A	A+	9
4	920817104004	AISHWARYA R	A	8
5	920817104005	AISHWARYA R	A	8
6	920817104006	AISHWERYA SRI R	B+	7
7	920817104007	AJITH KUMAR P J K	B+	7
8	920817104008	ALAGURAJA R	B+	7
9	920817104009	AMRUTHAA SHREE R	B	6
10	920817104010	ARUNKUMAR S	A	8
11	920817104011	BONSIYA R	A+	9
12	920817104012	CHELLAPANDIAN R	B+	7
13	920817104015	DINESH KUMAR C	A	8
14	920817104017	GURUPRABU R	B	6
15	920817104018	GURURAJ B	B	6
16	920817104017	HARIPRASATH T	UA	0
17	920817104020	JEGANATHAN R	A	8
18	920817104021	KAVIYA B I	A	8
19	920817104022	KAVIYARASAN A	B+	7
20	920817104023	KEERTHANA G	A	8
21	920817104024	KODEESWARAN S	B	7
22	920817104025	KOUSHIK ROMEL J	B	6
23	920817104026	LOGESHWARI S	A+	9
24	920817104027	MADHUBALA S	A+	9
25	920817104028	MANOJ K	A+	9
26	920817104029	MANOJ S	B	6
27	920817104030	MANUSHA M	B	6
28	920817104032	NAGAJOTHI C	A+	9
29	920817104034	NATHIPRIYA K	B+	7
30	920817104035	NATHISHKUMAR R	A	8
31	920817104036	NAVIN MANIKANDAN S	B	6
32	920817104037	NELSON J	A+	9
33	920817104038	NITHIS KANNA G	A+	9





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34	920817104039	PARAMESHWARI P	A	8
35	920817104040	POOVARASAN M	A	8
36	920817104041	POOVENDRAN K	B	6
37	920817104042	PRAKASH KUMAR S	A	8
38	920817104043	PREETHI A	B	6
39	920817104044	RAJADURAI R	B	6
40	920817104045	ROFINA BEGAM N	A+	9
41	920817104046	SANGEERANI P	B+	7
42	920817104047	SASTIANANDHAN M	A	8
43	920817104048	SHARMA A	B	6
44	920817104049	SUBASRI S	A+	9
45	920817104051	VARSHA M	B	6
46	920817104052	VIJAYALAKSHMI S	A	8
47	920817104053	VIJAYA SHANTHI M	A	8
48	920817104055	YOGESH KANNA S	B	6

Faculty In-Charge

HoD



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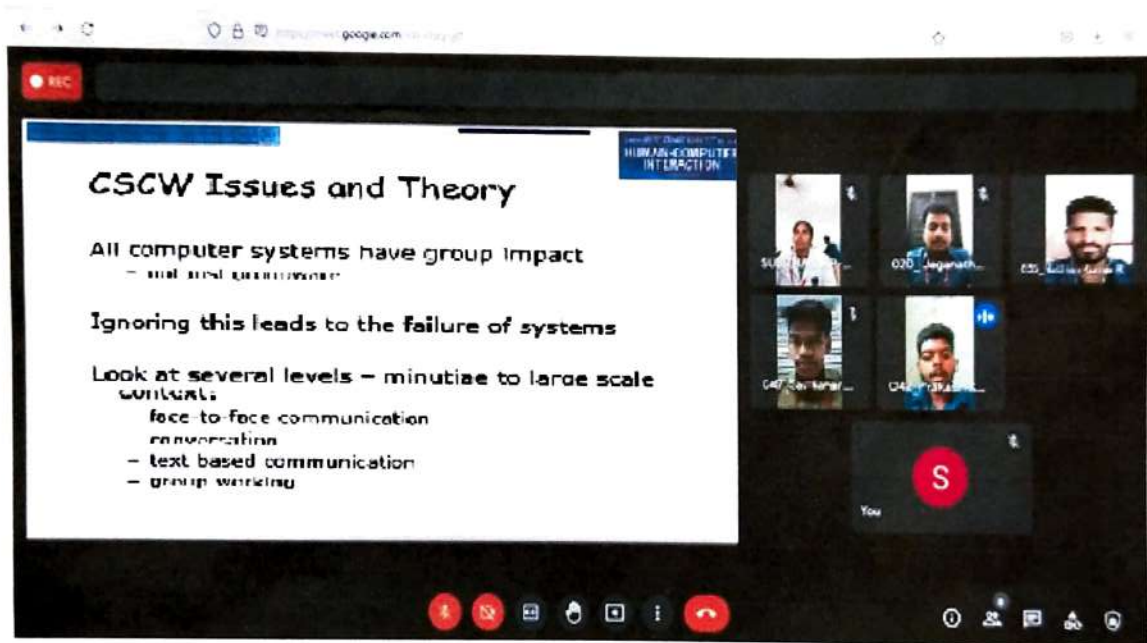
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**ATTENDANCE SCREENSHOT**

**Year / Semester: IV / VII**

**Subject Code: CS8079**

**Subject Name: Human Computer Interaction**





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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**ACADEMIC YEAR 2020 - 2021**

**REMEDIAL CLASS ANALYSIS FOR SLOW LEARNERS**

**CS8079 – HUMAN COMPUTER INTERACTION**

**Year / Sem: IV/VII**

**Batch :2017-2021**

S.NO	REGISTER NUMBER	NAME OF THE STUDENT	NUMBER OF HOURS TAKEN	UNIVERSITY RESULT	NUMBER OF STUDENTS PASSED / FAILED
1	920817104017	HARIPRASATH T	6	UA	PASSED : 6 FAILURE : 1
2	920817104020	JEGANATHAN R	6	A	
3	920817104024	KODEESWARAN S	6	B	
4	920817104035	NATHISHKUMAR R	6	A	
5	920817104042	PRAKASH KUMAR S	6	A	
6	920817104047	SASTIANANDHAN M	6	A	
7	920817104048	SHARMA A	6	B	

*N. Smt*  
**Faculty In charge**

*[Signature]*  
**HoD**



## UNIT I FOUNDATIONS OF HCI

The Human: I/O channels - Memory - Reasoning and Problem solving; The Computer; Devices - Memory - Processing and networks; Interaction: Models - Frameworks - Ergonomics - Styles - elements - interactivity - Paradigms.

### INTRODUCTION

\* Human Computer interaction (HCI) researches the design and use of computer technology focused on the interfaces between people (users) and computers.

#### User.

\* By "user", we may mean an individual user, a group of users working together. An appreciation of the way people's sensory systems (sight, hearing, touch) relay information is vital.

#### Computer

\* When we talk about the computer, we're referring to any technology ranging from desktop computers to large scale computer systems.

#### Interaction

\* There are obvious differences between humans and machines.

\* In HCI attempts to ensure that they both get on with each other and interact successfully.



## The Goals of HCI

- \* The goals of HCI are to produce usable and safe systems as well as functional systems.
- \* In order to produce computer systems with good usability, developers must attempt to understand the factors that determine how people use technology; develop tools and techniques to enable building suitable systems, achieve efficient, effective and safe interaction put people first.

## Usability

- \* Easy to learn
- \* Easy to remember how to use
- \* Effective to use.
- \* Efficient to use.
- \* Safe to use.
- \* Enjoyable to use.

## Factors in HCI

- \* Organisation Factors such as training, job design, politics, roles, work organisation
- \* Environmental Factors such as noise, heating, lighting, ventilation
- \* Health and Safety factors.

## User Interface

- \* Input devices, output devices, dialog structures, use of colour, icons, commands, navigation, graphics, natural language, user support, multimedia.

## Task Factors

- \* Easy, timescales, budgets, staff, equipment, buildings, novel task allocation, monitoring skills.

## Constraints

- \* Cost, timescales, buildings.





## System functionality

- \* Hardware, Software, application.

## Productivity Factors.

- \* Increase output, increase quality, decrease costs, decrease errors, increase innovation.

## Disciplines Contributing to HCI

- \* Computer Science
- \* Cognitive Psychology.
- \* Social Psychology.
- \* Ergonomics / Human Factors.
- \* Linguistics
- \* Artificial Intelligence
- \* Engineering & Design.

## INPUT-OUTPUT CHANNELS

- \* There are Five major senses: sight, hearing, touch, taste and smell.
- \* Vision

\* Human vision is a highly complex activity with a range of physical and perceptual limitations

- \* Two stages, the physical reception of the stimulus from the outside world, and the processing and interpretation of that stimulus.

## The Human eye

- \* Vision begins with light. The eye is a mechanism for receiving lighting and transforming it into electrical energy.

- \* The eye has a number of important components. The cornea and lens at the front of the eye focus the light into a sharp image on the back of the eye.



## Perceiving brightness

- \* An aspect of visual perception is the perception of brightness.
- \* Brightness is in fact a subjective reaction to levels of light.

## Perceiving colour

- \* Colour is usually regarded as being made up of three components: hue, intensity and saturation.

## Reading

- \* There are several stages in the reading process. First the visual pattern of the word on the page is perceived.
- \* During reading, the eye makes jerky movements called saccades. Followed by fixations.
- \* Adults read approximately 250 words a minute.

## Hearing

- \* The sense of hearing is often considered to sight, but we tend to underestimate the amount of information that we receive through our ears.
- \* The ear comprises three sections commonly known as outer ear, middle ear and inner ear.

## Processing sound.

- \* Pitch is the frequency of the sound.
- \* A low frequency produces a low pitch, a high frequency, a high pitch.
- \* Loudness is proportional to the amplitude of the sound, the frequency remains constant.





- \* The human ear can hear frequencies from about 20 Hz to 15 kHz. It can distinguish frequency changes of less than 1.5 Hz at low frequencies but is less accurate at high frequencies.

### Touch

- \* Touch provides us with vital information about our environment. It tells us when we touch something hot or cold, and can therefore act as a warning.
- \* An important part of the task of pressing the button.

### Movement

- \* A simple action such as hitting a button in response to a question involves a number of processing stages.
- \* The stimulus is received through the sensory receptors and transmitted to the brain. The question is processed and a valid response generated.
- \* A second measure of motor skill is accuracy.

One common form is

$$\text{Movement time} = a + b \log_2(\text{distance}/\text{size} + 1)$$

where  $a$  and  $b$  are empirically determined constants.





# HUMAN MEMORY

- \* Memory is the second part of our model of the human as an information-processing system.
- \* It is generally agreed that there are three types of memory (or) memory function: Sensory buffers, short term memory (or) working memory and long term memory.

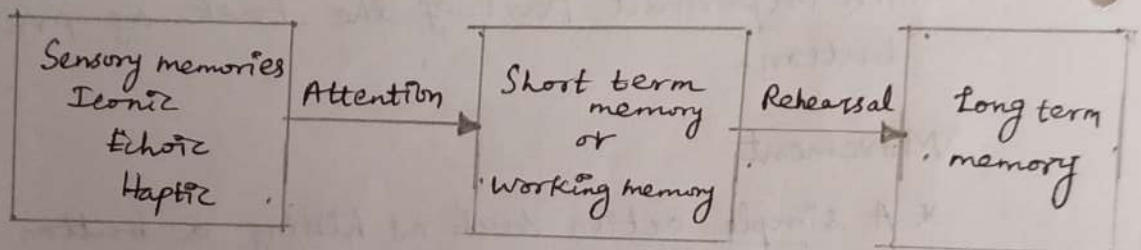


Figure: A model of the structure of memory

## Sensory Memory.

- \* The sensory memories act as buffers for stimuli received through the senses.
- \* A sensory memory exists for each sensory channel: iconic memory for visual stimuli, echoic memory for aural stimuli and haptic memory for touch.
- \* Attenuation is the concentration of the mind on one out of a number of competing stimuli or thoughts.

## Short term memory

- \* Short term memory or working memory acts as a scratch pad for temporary recall of information.
- \* It is used to store information which is only required fleetingly, in the order of 70 ms.

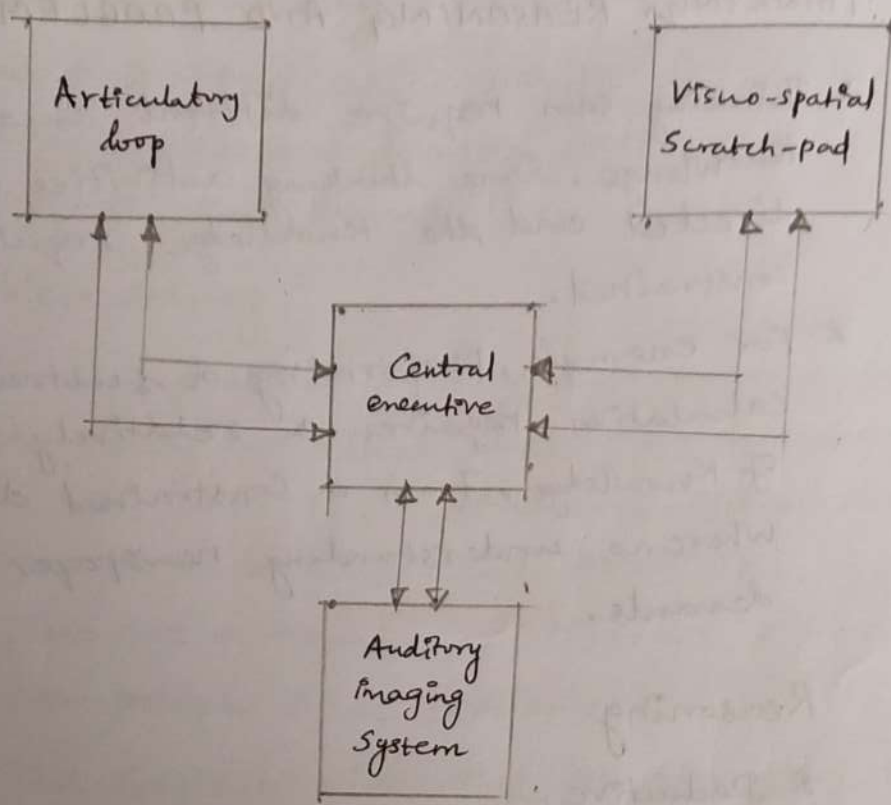


Fig:- Model of short term memory.

### Long Term Memory

- \* Long term memory is intended for the long term storage of information.
- \* Information is placed there from working memory through rehearsal. Unlike working memory there is little decay: long term recall after minutes is the same as that after hours or days.
- \* There are two types of memory: episodic memory and semantic memory.



## Abductive reasoning

- \* The third type of reasoning is abduction. Abduction reasons from a fact to the action or state that caused it.

## Problem solving

- \* Human problem solving is characterized by the ability to adapt the information we have to deal with new situations often solutions seem to be original and creative.
- \* There are a number of different views of how people solve problems.
- \* The Gestalt view that problem solving involves both reuse of knowledge and insight.

## Gestalt theory

- \* Gestalt psychologists were answering by claim, made by behaviorists, that problem solving is a matter of reproducing known responses or trial and error.

## Problem space theory

- \* Newell and Simon proposed that problem solving centers on the problem space.
- \* The problem space comprises problem states and problem solving involves generating these states using legal state transition operators.





- \* Newell and Simon's theory and their General Problem Solver model which is based on it, have largely been applied to problem solving in well defined domains, for example solving puzzles.

### Analogy in problem solving

- \* A third element of problem solving is the use of analogy. Similarities between the known domain and the new one are noted and operators from the known domain are transferred to the new one.

### Skill acquisition

- \* All of the problem solving that we have considered so far has concentrated on handling unfamiliar problems.
- \* A commonly studied domain is chess playing. It is particularly suitable since it lends itself easily to representation in terms of problem space theory.

### Errors and mental models.

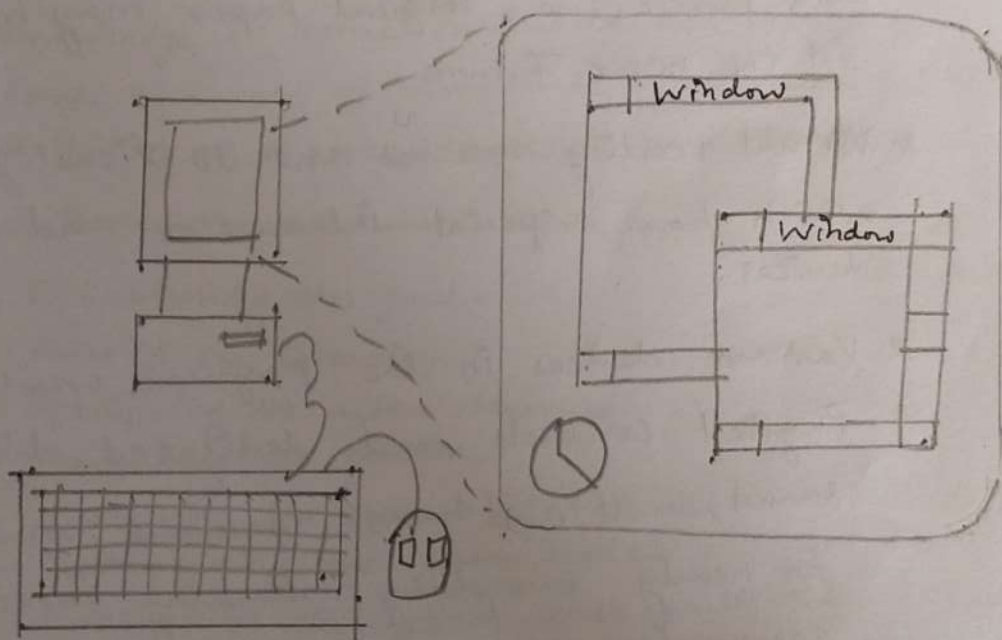
- \* Human capability for interpreting and manipulating information is quite impressive. Some are trivial, resulting in no more than temporary inconvenience or annoyance.
- \* Others may be more serious, requiring substantial effort to correct.



# THE COMPUTER

## A typical Computer system

- \* There is the computer 'box' itself; a keyboard, a mouse and a colour screen.
- \* The screen layout is shown along side it, data have to be entered into and obtained from a system and there are also many different types of user, each with their own unique requirements.



## Batch processing

- \* The user would simply dump a pile of punched cards onto a reader, press the Start button, and then return a few hours later.

Richer Interaction - everywhere, every when  
- WAP phones and smart cards.



## Various Elements.

- \* Input devices For interactive use, allowing text entry, drawing and selection from the screen. traditional keyboard, phone text entry, speech and handwriting, pointing, the mouse, 3D interaction devices
- \* Output display devices For interactive use, different types of screen mostly using some form of bit map display, large displays and shared and public use, digital paper may be usable in the near future.
- \* Virtual reality systems and 3D visualization which have special interaction and display devices.
- \* Various devices in the physical world, physical controls and dedicated displays, sound, smell and haptic feedback, sensors for nearly everything including movement, temperature, bio-signs
- \* Paper off and input the paperless office and the less paper office scanners and OCR.
- \* Memory, short term memory: RAM, long term memory, magnetic & optical disk, capacity limitations related to document and video storage
- \* Processing - Network.
- \* Network Hubs - switches, bridges, routers, gateways, NIC, WAP's.





## INTERACTION MODELS

- \* Interaction involves at least two participants, the user and the system.
- \* The interface must effectively translate between them to allow the interaction to be successful.
- \* The translation can fail at a number of points and for a number of reasons.

### Interaction

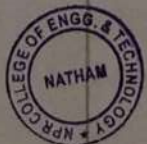
- \* The purpose of an interactive system is to aid a user in accomplishing goals from some application domain.
- \* A domain defines an area of expertise and knowledge in some realworld activity.
- \* Some examples of domains are graphic design, authoring and process control in a factory.

The Execution-evaluation cycle (Norman's model of Interaction)

1. Establishing the goal.
2. Forming the intention.
3. Specifying the action sequence
4. Executing the action.
5. Perceiving the system state.
6. Interpreting the system state.
7. Evaluating the system state with respect to the goals and intentions.

## FRAMEWORKS

- \* The interaction framework attempts a more realistic description of interaction by including the system explicitly, and breaks it into four main components.
- \* The nodes represent the four major components in an interactive system - the system, the user, the input and the output.



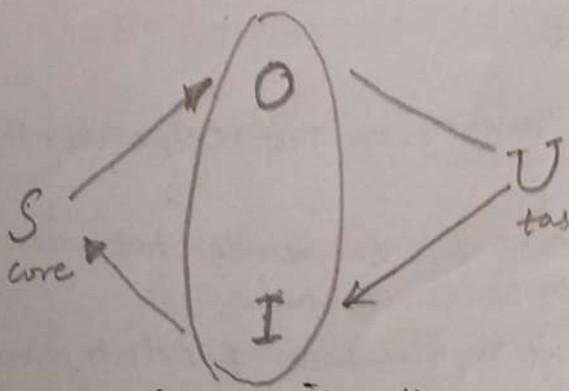


Fig: - General Interaction Framework

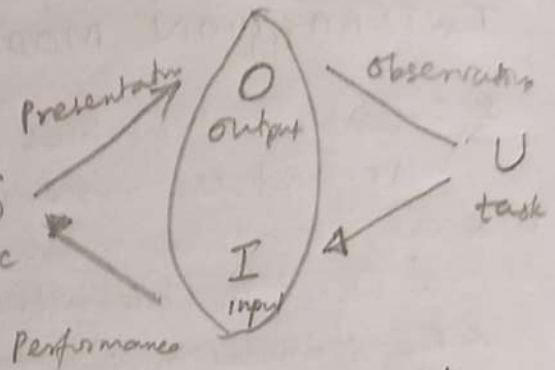


Fig: - Translations between Components

- \* The System then transforms itself as described by the operations, the execution phase of the cycle is complete and the evaluation phase now begins.
- \* The System is in a new state, which must now be communicated to the User.

### Assessing overall interaction.

- \* The interaction Framework is presented as a means to judge the overall usability of an entire interactive system.
- \* For a particular editing task, one can choose the text colour editor best suited for interaction relative to the task.

### Frameworks and HCI

- \* The Field of ergonomics addresses issues on the user side of the interface, covering input and output, as well as the user's immediate content.
- \* Dialog design and interface styles can be placed particularly along the input branch of the Framework, addressing both articulation and Performance.
- \* Presentation and screen design relates to the output branch of the Framework. The entire Framework can be placed within a social and organization context that also affects the interaction.



## ERGONOMICS

- \* Ergonomics (or human factors) is traditionally the study of the physical characteristics of the interaction, how the controls are designed, the physical - environment in which the interaction takes place and the layout and physical qualities of the screen.
- \* A primary focus is on user performance and how the interface enhances or detracts from this.
- \* In seeking to evaluate these aspects of the interaction, ergonomics will certainly also touch upon human psychology and system constraints.

### Arrangement of controls and displays.

- \* The exact organization that this will suggest will depend on the domain and the application but possible organizations include the following.
- \* Functional controls and displays are organized so that those that are functionally related are placed together.
- \* Sequential controls and displays are organized to reflect the order of their use in a typical interaction.
- \* Frequency controls and displays are organized - according to how frequently they are used, with the most commonly used controls being the most easily accessible.

### The physical environment of the interaction

- \* Physical issues in the layout and arrangement of the machine interface, ergonomics is concerned with the design of the work environment itself





- \* This will depend largely on the domain and will be more critical in specific control and operational settings than in general computer use.

### Health Issues

- \* There are a number of factors that may affect the use of more general computers.
- \* These factors in the physical environment that directly affect the quality of the interaction and the user's.

### Performance

- \* Users should be able to reach all controls comfortably and see all displays.
- \* Users should not be expected to stand for long periods and if sitting should be provided with back support.
- \* If a particular position for a part of the body is to be adopted for long periods support should be provided to allow rest.

### Temperature

- \* Extremes of hot or cold will affect performance and in excessive cases, health.
- \* Experimental studies show how the performance deteriorates at high or low temperatures, with users being unable to concentrate efficiently.

### Lighting

- \* The lighting level will again depend on the work environment.
- \* Adequate lighting should be provided to allow users to see the computer screen without discomfort or eye strain.
- \* The light source should also be positioned to avoid glare at the screen.



## INTERACTION STYLES.

Interaction can be seen as a dialog between the Computer and the user. The choice of interface style can have a profound effect on the nature of this dialog.

- \* Command line interface
- \* menus
- \* natural language
- \* question/answer and query dialog
- \* Form Fills and spreadsheets
- \* WIMP
- \* Point and click
- \* Three dimensional interfaces.

### Command line interface

- \* The command line interface was the first interactive dialog style to be commonly used and, inspite of the availability of menu-driven interfaces, it is still widely used.
- \* It provides a means of expressing instructions to the computer directly, using Function keys, single characters, abbreviations or whole-word commands.

### Menus

- \* In a menu-driven interface, the set of options available to the user is displayed on the screen, and selected using the mouse, or numeric or alphabetic keys.





## Natural Language

- \* Users, unable to remember a command or lost in a hierarchy of menus, may long for the computer that is able to understand instructions expressed in everyday words!
- \* Natural language understanding. Both of speech and written input, is the subject of much interested and research. The ambiguity of natural language makes it very difficult for a machine to understand.

## Question/answer and query dialog

- \* Question and answer dialog is a simple mechanism for providing input to an application in a specific domain.
- \* The user is asked a series of questions and so is led through the interaction step by step. These interfaces are easy to learn and use, but are limited in functionality and power.

## Form fills and spread sheets

- \* Form filling interfaces are used primarily for data entry but can also be useful in data retrieval applications.
- \* The user is presented with a display resembling a paper form with slots to fill in.

## The WIMP interface

- \* WIMP stands for windows, icons, menus and pointers (sometimes windows, icons, mice and pull down menus), and is the default interface style for the majority of interactive computer systems in use today.
- \* Especially in the PC and desktop workstation arena. Examples of WIMP interface include Microsoft Windows for PC and Amiga.





## Point and click interfaces

- \* This point and click interface style is obviously closely related to the WIMP style
- \* It clearly overlaps in the use of buttons, but may include other WIMP elements, the philosophy is simpler and more closely tied to ideas of hypertext.

## Three Dimensional interfaces

- \* There is an increasing use of three dimensional effects in user interfaces. The most obvious example is virtual reality, but VR is only part of range of 3D techniques available to the interface designer.
- \* The simplest technique is where ordinary WIMP elements, buttons, scroll bars, etc.,

## INTERACTIVITY

- \* Dialog design is focused almost entirely on the choice and specification of appropriate sequences of actions and corresponding changes in the interface state.
- \* It is typically not used at a fine level of detail and deliberately ignores the semantic level of an interface.
- \* For example, the validation of numeric information in a forms-based system. It is worth remembering that interactivity is the defining feature of an interactive system.
- \* Interactivity is also crucial in determining the feel of a WIMP environment. All WIMP systems appear to have virtually the same elements windows, icons, menus, pointers, dialog boxes, buttons, etc.

## THINKING, REASONING AND PROBLEM SOLVING

- \* Thinking can require different amounts of knowledge. Some thinking activities are much directed and the knowledge required is constrained.
- \* For example, performing a subtraction calculation requires a relatively small amount of knowledge, from a constrained domain, whereas understanding newspaper headlines demands.

### Reasoning

- \* Deductive
- \* Inductive
- \* Abductive.

### Deductive reasoning

- \* It derives the logically necessary conclusion from the given premises.

For example

If it is Friday then she will go to work

It is Friday

Therefore she will go to work.

### Inductive Reasoning

- \* Induction is generalizing from cases we have seen to infer information about cases we have not seen.

All elephants have trunks.





**12. List out the tools for screen layout? (Understanding)**

There are number of visual tools available to help the user appropriate ways to read and interact with a screen or device

- Grouping and structure
- Order of groups and items
- Decoration
- Alignment
- White space

**13. What is formative evaluation? (Understanding)**

*Formative evaluation* for any of the prototypes, either paper-based or running software, which is evaluated to check whether they are acceptable or there is room for improvement. This sort of evaluation is intended to improve designs.

**14. What is summative evaluation? (Understanding)**

*Summative evaluation* is performed at the end to verify whether the product is good enough.

**15. How software engineering plays a role in interactive system design? (Understanding)**

Software engineering provides a means of understanding the structure of the design process, and that process can be assessed for its effectiveness in interactive system design

**16. Define software life cycle? (Understanding)**

Software life cycle, which describes the activities that take place from the initial concept formation for a software system up until its eventual phasing out and replacement

**17. What are the activities in the software life cycle? (Understanding)**

The activities in the software life cycle are

- Requirements specification
- Architectural design
- Detailed design
- Verification & Validation
- Management and contractual issues

**18. List some of the specifications in Usability engineering (Understanding)**

Some of the usability specifications are

- usability attribute/principle
- measuring concept
- measuring method
- now level/ worst case/ planned level/ best case

**19. What are the problems in Usability engineering? (Understanding)**

The problems in Usability engineering

- usability specification requires level of detail that may not be possible early in design
- satisfying a usability specification does not necessarily satisfy usability

**20. What are the three main approaches to prototyping? (Understanding)**

The three main approaches to prototyping are

- **Throw-away:** The prototype is built and tested.
- **Incremental:** The final product is built as separate components.





## Noise

- \* Excessive noise can be harmful to health, causing the user pain, and in acute cases, loss of hearing.
- \* Noise levels should be maintained at a comfortable level in the work environment.

## Time

- \* The time users spend using the system should also be controlled.
- \* It has been suggested that excessive use of CRT displays can be harmful to users, particularly pregnant women.

## The use of color

- \* Colors used in the display should be as distinct as possible and the distinction should not be affected by changes in contrast.
- \* Blue should not be used to display critical information.
- \* If color is used as an indicator it should not be the only cue; additional coding information should be included.

## Ergonomics and HCI

- \* Ergonomics is a huge area, which is distinct from HCI but sits alongside it.
- \* Its contribution to HCI is in determining constraints on the way we design systems and suggesting detailed and specific guidelines and standards.
- \* Ergonomic factors are in general well established and understood and are therefore used as the basis for standardizing hardware designs.



- \* In fact, menus are a major difference between the MacOs and Microsoft Windows environments:
- \* In MacOs you have to keep the mouse depressed throughout menu selection: in windows you can click on the menu bar and pull down menu appears and remains there until an item is selected or it is cancelled
- \* In WIMP environments, the user takes the initiative, with many options and often many applications simultaneously available. The exceptions to this are preemptive parts of the interface.
- \* Interactivity is also critical in dealing with errors. The other way to deal with errors is to make sure that the user or the system is able to tell when errors have occurred.
- \* If users can detect errors then they can correct them. So, even if errors occur, the interaction as a whole succeeds.

## PARADIGMS

### Time Sharing

- \* Major contributions to come out of this emphasis in research were the concept of time sharing, in which a single computer could support multiple users.
- \* The human was restricted to batch sessions, in which complete jobs were submitted on punched cards or paper tape to an operator who would then run them individually on the computer.
- \* Time sharing systems of the 1960s made programming a truly interactive venture and brought about a subculture of programmers - hackers





- \* The purpose of first interactive time sharing systems was simply to augment the programming capabilities of the early hackers

### Video Display units

- \* In mid 1950s researchers were experimenting with the possibility of presenting and manipulating information from a computer in the form of images on a video display unit (VDU).
- \* The earliest applications of display screen images were developed in military applications.
- \* Most notably the Semi-Automatic Ground Environment (SAGE) project of the US Air force.

### Programming toolkits

- \* Douglas Englebart's ambition since the early 1950s was to use computer technology as a means of complementing human problem solving activity.

### Personal Computing

- \* Programming toolkits provide a means for those with substantial computing skills to increase their productivity greatly.
- \* Logo - graphics programming language
- \* By typing in English phrases, such as go forward or turn left, the child/programmer could teach the turtle to draw more and more complicated figures.

### The Metaphor

- \* Paper used the metaphor of a turtle dragging its tail in the dirt. children could quickly identify with the real world phenomenon and that instant familiarity gave them an understanding.





## Hypertext

- \* Hypertext is text which is not constrained to be linear.
- \* Hypertext is text which contains links to other texts.
- \* The term was coined by Ted Nelson around 1965.
- \* Hypermedia is a term is used for hypertext which is not constrained to be text.
- \* It can include graphics, video and sound.
- \* For example, Apparently Ted Nelson was the first to use this term too.
- \* Hypertext and Hypermedia are concepts, not products.

## Multimodality

- \* Personal computing, genuine multimodal systems rely to a greater extent on simultaneous use of multiple communication channels for both input and output.
- \* Human quite naturally process information by simultaneous use of different channels.

\* Computer-Supported Cooperative work

\* The world wide web

\* Ubiquitous Computing.



**CS8079- HUMAN COMPUTER INTERACTION**

**Unit –I - FOUNDATIONS OF HCI**

**PART - A**

**1. What is HCI? (Understanding)**

HCI (human-computer interaction) is the study of how people interact with computers and to what extent computers are or are not developed for successful interaction with human beings.

Human-computer interaction researches the design and use of computer technology, focused on the interfaces between people (users) and computers. Researchers in the field of HCI both observe the ways in which humans interact with computers and design technologies that let humans interact with computers in novel ways.

**2. List the fields involved in HCI? (Understanding)**



**3. List the various human input and output channels?(Understanding)**

- Visual channel
- Auditory channel
- Haptic channel
- Movement

**4. Define Fitts' Law (Remember)**

Fitts' Law describes the time taken to hit a screen target:  $Mt = a + b \log_2(D/S + 1)$

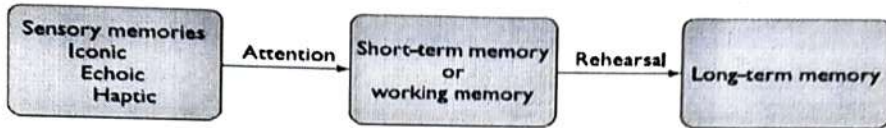
where: a and b are empirically determined constants  
 Mt is movement time; D is Distances S is Size of target

**5. What are the different types of memory in human brain?(Understanding)**

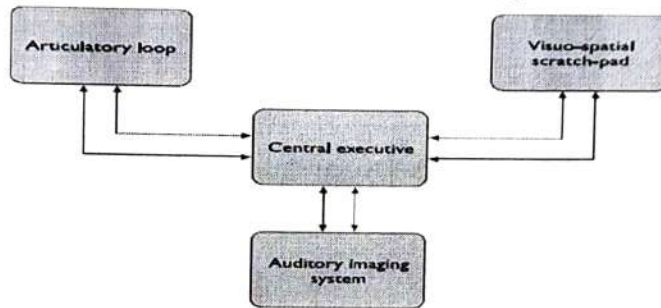
- Sensory memory
- Short-term (working) memory
- Long-term memory.



6. Give the model of the structure of the memory (Understanding)



7. Give the model of short-term memory(Understanding)



8. List the factors involved in processing and applying the information? (Understanding)

- reasoning
- problem solving
- skill acquisition
- Error

9. What is reasoning and give its type? (Apr/May'17) (Understanding)

Reasoning is the process by which we use the knowledge we have to draw conclusions or infer something new about the domain of interest. There are a number of different types of reasoning:

- deductive
- inductive
- abductive.

10. Give example for deductive, inductive, abductive – reasoning (Analyze)

a. Deductive - derive logically necessary conclusion from given premises.

e.g. If it is Friday then she will go to work  
 It is Friday  
 Therefore she will go to work

b. Inductive - generalize from cases seen to cases unseen

e.g. All elephants we have seen have trunks  
 therefore all elephants have trunks.

c. Abductive. – reasoning from event to cause ex:

Sam drives fast when drunk  
 if I see sam driving fast, assuming drunk





**11. Define Problem Solving & list the theories involved in problem solving (Understanding)**

Problem solving is the process of finding a solution to an unfamiliar task, using the knowledge we have. Human problem solving is characterized by the ability to adapt the information we have to deal with new situations.

Theories involved in problem solving

- Gestalt theory
- Problem space theory
- Analogy – mapping knowledge relating to a similar known domain to the new problem – called analogical mapping.

**12. What are the different types of errors (Understanding)**

Types of error

- Slips
  - right intention, but failed to do it right
  - Causes: poor physical skill, inattention etc.
  - change to aspect of skilled behavior can cause slip
- Mistakes
  - wrong intention
  - cause: incorrect understanding

Humans create mental models to explain behavior. If wrong (different from actual system) errors can occur.

**13. What are three basic levels of skill? (Understanding)**

- The learner uses general-purpose rules which interpret facts about a problem. This is slow and demanding on memory access.
- The learner develops rules specific to the task.
- The rules are tuned to speed up performance.

**14. What is mental model? (Understanding)**

People build their own theories to understand the causal behavior of systems. These have been termed mental models.

**15. Give the uses of input device (Understanding)**

Input devices for interactive use, allowing text entry, drawing and selection from the screen:

- Text entry: traditional keyboard, phone text entry, speech and handwriting
- Pointing: principally the mouse, but also touchpad, stylus and others
- 3D interaction devices.

**16. What are the various devices in the physical world?(Understanding)**

Various devices in the physical world:

- Physical controls and dedicated displays
- Sound, smell and haptic feedback
- Sensors for nearly everything including movement, temperature, bio-signs.



**17. Give the capacities of different storage media (Understanding)**

	STM small/fast	LTM large/slower
Media	RAM	Hard disk
Capacity	256 Mbytes	100 Gbytes
Access time	10 ns	7 ms
Transfer rate	100 Mbyte/s	30 Mbyte/s

**18. Define Compression and its types (Understanding)**

Reduce amount of storage required

- Lossless
  - recover exact text or image – e.g. GIF, ZIP
  - look for commonalities:
    - text: AAAAAAAAAABBBBBBCCCCCCCC □10A5B8C
    - video: compare successive frames and store change
- Lossy
  - recover something like original – e.g. JPEG, MP3
  - exploit perception
    - JPEG: lose rapid changes and some colour MP3: reduce accuracy of drowned out notes

**19. What are the 2 methods for detecting motion? (Understanding)**

- Mechanical
  - Ball on underside of mouse turns as mouse is moved
  - Rotates orthogonal potentiometers
  - Can be used on almost any flat surface
- Optical
  - light emitting diode on underside of mouse
  - may use special grid-like pad or just on desk
  - less susceptible to dust and dirt
  - detects fluctuating alterations in reflected light intensity to calculate relative motion in (x, z) plane

**20. List the computer types in pockets and house? (Understanding)**

In house	In pockets
<ul style="list-style-type: none"> <li>• PC</li> <li>• TV, VCR, DVD, HiFi, cable/satellite TV</li> <li>• microwave, cooker, washing machine</li> <li>• central heating</li> <li>• security system</li> </ul>	<ul style="list-style-type: none"> <li>• PDA</li> <li>• phone, camera</li> <li>• smart card, card with magnetic strip</li> <li>• electronic car key</li> <li>• USB memory</li> </ul>







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## 21. Limitations on interactive performance(Understanding)

Computation bound

- Computation takes ages, causing frustration for the user
- Storage channel bound
- Bottleneck in transference of data from disk to memory
- Graphics bound
- Common bottleneck: updating displays requires a lot of effort
- Some times helped by adding a graphics co-processor optimized to take on the burden

Network capacity

- Many computers networked - shared resources and files, access to printers etc. - but interactive performance can be reduced by slow network speed

## 22. Define the term of interaction i.e. domain, goal,task (Understanding)

Domain – the area of work under study

e.g. graphic design

Goal – what you want to achieve

e.g. create a solid red triangle

Task – how you go about doing it

- ultimately in terms of operations or actions

e.g. ... select fill tool, click over triangle

## 23. List the seven stages of Donald Norman’s model (Understanding)

The seven stages are

- User establishes the goal
- Formulates intention
- Specifies actions at interface
- Executes action
- Perceives system state
- Interprets system state
- Evaluates system state with respect to goal

## 24. List the steps involved execution/evaluation loop (Understanding)

- User establishes the goal
- Formulates intention
- Specifies actions at interface
- Executes action
- Perceives system state
- Interprets system state
- Evaluates system state with respect to goal

## 25. What are the 4 parts of Abowd and Beale framework (Understanding)

It is the extension of Norman model, it has 4 parts

- a. user
- b. input
- c. system





**26. Define Ergonomics with example (Apr/May '17) (Understanding)**

- Study of the physical characteristics of interaction
- Ergonomics good at defining standards and guidelines for constraining the way we design certain aspects of systems

Ex 1: arrangement of controls and displays

e.g. controls grouped according to function or frequency of use, or sequentially

Ex 2: surrounding environment

e.g. seating arrangements adaptable to cope with all sizes of user

**27. What are the Common interaction styles (Understanding)**

- Command line interface
- Menus
- Natural language
- Question/answer and query dialogue
- Form-fills and spreadsheets
- WIMP
- Point and click
- Three-dimensional interfaces

**28. What is WIMP Interface (Understanding)**

Windows, Icons, Menus, Pointers. It is the default style for majority of interactive computer systems, especially PCs and desktop machines

**29. What are Paradigms? (Understanding)**

Predominant theoretical frameworks or scientific world views e.g., Aristotelian, Newtonian, Einsteinian (relativistic) paradigms in physics

**30. Give example for Paradigm Shifts (Remember)**

- Batch processing
- Timesharing
- Networking
- Graphical display
- Microprocessor
- WWW
- Ubiquitous Computing

**31. What is Metaphor (Understanding)**

Relating computing to other real-world activity is called metaphor. Example:

- LOGO's turtle dragging its tail
- File management on an office desktop
- Word processing as typing
- Financial analysis on spreadsheets
- Virtual reality – user inside the metaphor



**32. What is CSCW? (Understanding)**

- Computer Supported Cooperative Work
- CSCW removes bias of single user / single computer system
- Can no longer neglect the social aspects
- Electronic mail is most prominent success

**33. How does spreading activation affect the interference effects during information recall from memory? (Nov/Dec '17) (Understanding)**

When information becomes easier to access as a result of having been used recently, we say it is more activated. This activation spreads between semantically related concepts.

**Empirical Evidence:**

- Subjects are faster at confirming that a pair of words is both words if the second word is an associate of the first, for example, bread and butter.
- Given a word, subjects are asked to give an associated word. Their response is faster if subjects have responded with an associated word on a previous trial.
- Speed of activation seems to be about 200ms

**34. What type of HCI paradigm could be used to monitor eruptions of active and hazardous volcanoes? Reason out? (Nov/Dec '17) (Understanding)**

The type of HCI paradigm used to monitor eruptions of active and hazardous volcanoes is Ubiquitous, or pervasive computing. It is an emerging paradigm for computing. The aim of pervasive computing is to create a computing infrastructure that permeates our physical environment such that we no longer notice the computer

**35. What are mental models and why are they important in interface design? (Remember) (April/May 2018)**

They are the beliefs that a user holds about any given system or interaction. This is important because users will plan and predict future actions within a system based on their mental models. Designers can tap into users mental models so that their products communicate their function through their form.

**36. What is Directive reasoning? (Remember) (NOV/DEC 2018)**

Directive reasoning is sometimes referred to as top down logic. Its counterpart, inductive reasoning, is sometimes referred to as bottom-up logic.

**37. List the factors that can limit the speed of an interactive system? (Remember) (NOV/DEC 2018) /**

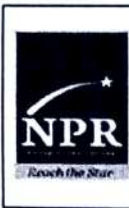
**What are the important factors to be considered in design of an interactive systems? (Remember) (Apr/May 2019)**

Several factors that can limit the speed of an interactive system. They can be:

- Computation bound: Make sure the user has an indication of the system's progress.
- Storage channel bound: Select the best fitting kind of memory and access technique.
- Graphics bound: The actual time of graphic operations can differ much from the estimates.
- Network capacity







### PART – B

1. Describe about I/O channels & Human Memory(Understanding)
2. Explain about reasoning and problem solving(Understanding)
3. Explain about devices for virtual reality and 3D interaction(Understanding)
4. Explain in detail about models of interaction(Understanding)
5. Explain the various interaction styles(Analyze)
6. Explain the Paradigms for Interaction(Understanding)
7. Distinguish between short term and long term memory. State requirements to perform cognitive walkthrough of a system. (Nov/Dec '17)(Analyze)
8. With examples explain the various types of users and the organizational issues to be considered in designing an interactive system. (Nov/Dec '17)(Understanding)
9. (i) Explain the model of the structure of human memory with diagrammatic illustration. (Apr/May '17) (Understanding)  
(ii) Outline the factors that can limit the speed of an interactive computer system. (Apr/May '17) (Understanding)
10. i) List and explain the stages of Norman's model of interaction. (Apr/May '17) (Understanding)  
(ii) Outline the common interface styles used in interactive system. (Apr/May '17) (Understanding)
11. Explain the framework of Human computer interaction (Remember) (NOV/DEC 2018)
12. Highlight the features of direct manipulation interface (Remember) (NOV/DEC 2018)
13. Discuss the technologies involved in display devices? (Remember) (NOV/DEC 2018)
14. Brief about the common interface styles used in interactive system (Remember) NOV/DEC 2018
15. i) Discuss in detail about the interaction frameworks (Remember)  
ii) Brief about the memory devices of a computer (Remember) (Apr/May 2019)
16. i) Explain the different types of reasoning (Remember) (Apr/May 2019)  
ii) Describe the various styles of interaction (Remember) (Apr/May 2019)

### PART C

1. Explain about the elements of the WIMP interface.(Understand) (Apr/May'18)
2. i) Write down the effects of finite processor.(Understand)(Apr/May'18)  
ii) Write down the factors that can limit the speed of an interactive system
3. Design a word processor for blind users which can also be operated by sighted people. It has to support the standard set of word processing task. For this application, choose a suitable combination of input and output devices to best support the intended interaction. It may help to identify typical users or classes of user, and identify how the devices chosen support these people in their tasks. Explain the major problems that the input and output devices solve. (Analyze) (Apr/May '19)







## UNIT II - DESIGN & SOFTWARE PROCESS PART – A

### 1. Define Interaction Design (Understanding)

Interaction design is about understanding and choosing how that is going to affect the way people work.

### 2. What is the golden rule of design? (Understanding)

The golden rule of design is to “**understand your materials**”. In case of Human–Computer Interaction the obvious materials are the human and the computer. In other words, it is

- **understand computers** – limitations, capacities, tools, platforms
- **understand people** – psychological, social aspects, human error.

### 3. Define Scenarios (Understanding)

Scenarios are the simplest design representation, but one of the most flexible and powerful. Some scenarios are quite short and others are focused more on describing the situation or context.

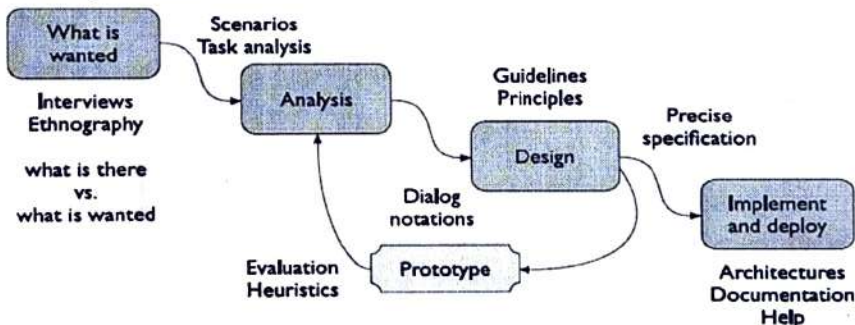
### 4. What are Story boards? (Understanding)

Scenarios can be augmented by sketches, simulated screen shots, etc. These sketches and pictures are called storyboards and are similar to the techniques used in film making to visualize plot-lines.

### 5. Explain the Process of Design (Remember)

The Various stages of the design process are

#### 1. Requirements



#### 2. Analysis

#### 3. Design Iteration and prototyping

#### 4. Implementation and deployment

### 5. List the situations where scenarios can be used? (Understanding)

Scenarios can be used to:

**Communicate with others** – other designers, clients or users.

**Validate other models** a detailed scenario can be ‘played’ against various more formal representations such as task models or dialog and navigation models. **Express dynamics** Individual screen shots and pictures give you a sense of what a system would look like, but not how it behaves.



**6. Discuss about the pros and cons of Linear Path Scenario (Understanding)**

Pros:

- Life and time are linear
- Easy to understand (stories and narrative are natural)
- Concrete (errors less likely)

Cons:

- No choice, no branches, no special conditions
- Miss the unintended

**7. What are the two issues in structure with respect to Navigation design? (Understanding)**

The two issues in structure are:

- Local structure : looking from one screen or page out
- Global structure : structure of site, movement between screens

**8. List out the various levels of interaction in Navigation design? (Understanding)**

PC application	Website	Physical device
Widgets Screen design	Form elements, tags and links	Buttons, dials, lights, displays
Navigation design	Page design	Physical layout
Other apps and operating system	Site structure The web, browser,	Main modes of device The real world
	external links	

**9. What are bread crumbs? (Understanding)**

A “breadcrumb” (or “breadcrumb trail”) is a type of secondary navigation scheme that reveals the user's location in a website or Web application.



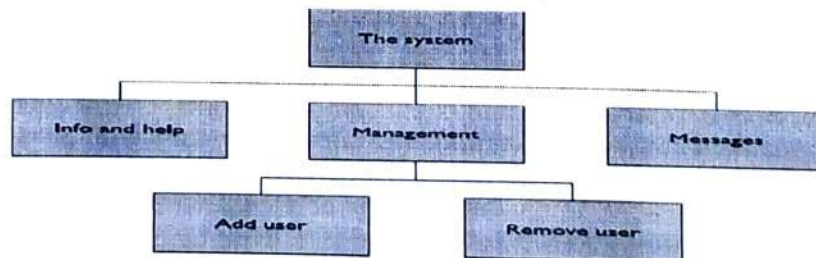
**10. What are the different types of bread crumbs? (Analyze)**

**Location-based:** Location-based breadcrumbs show the user where they are in the website's hierarchy.

**Attribute-based:** Attribute-based breadcrumb displays the attributes of a particular page.

**Path-based:** Path-based breadcrumb show users the steps they've taken to arrive at a particular page. Path-based breadcrumbs are dynamic in that they display the pages the user has visited before arriving on the current page.

**11. Draw the menu structure of a PC application. (Create)**





- **Evolutionary:** It serves as the basis for the next iteration of design.

**21. Define design rationale and its benefits? (Understanding)**

Design rationale is information that explains why a computer system is the way it is, including its structural or architectural description and its functional or behavioral description.

**Benefits of design rationale**

- communication throughout life cycle
- reuse of design knowledge across products
- enforces design discipline
- presents arguments for design trade-offs
- organizes potentially large design space
- capturing contextual information

**22. List some of the goals of Evaluation? (Understanding)**

The goals of Evaluation are

- Assess extent of system functionality
- Assess effect of interface on user
- Identify specific problems

**23. What are the four approaches to expert analysis(Understanding)**

The four approaches to expert analysis are cognitive walkthrough, heuristic evaluation, the use of models and use of previous work.

**24. What is Cognitive walkthrough (Understanding)**

Cognitive walkthrough is an attempt to introduce psychological theory into the informal and subjective walkthrough technique. The origin of the cognitivewalkthrough approach to evaluation is the code walkthrough in software engineering.

**25. What is heuristic evaluation (Understanding)**

A heuristic is a guideline or general principle or rule of thumb that can guide a design decision or be used to critique a decision that has already been made. Heuristic evaluation is a method for structuring the critique of a system using a set of relatively simple and general heuristics. Heuristic evaluation can be performed on a design specification so it is useful for evaluating early design.

**26. What are the two distinct evaluation styles? (Understanding)**

The two distinct evaluation styles are

1. **Laboratory studies** - Users are taken out of their normal work environment to take part in controlled tests often in a specialist usability laboratory.
2. **Field studies** - The designer or evaluator is taken to the user's work environment in order to observe the system in action.

**28. What is Experimental evaluation (Understanding)**

It is one of the most powerful methods of evaluating a design is to use a controlled experiment. This provides empirical evidence to support a particular claim or hypothesis.



**29. List some of the factors in experimental evaluation? (Understanding)**

The factors in experimental evaluations are

- Subjects : Who is the representative, sufficient sample
- Variables : Things to modify and measure
- Hypothesis : What you'd like to show
- Experimental design :How you are going to do it

**30. What are two different types of variables in experimental evaluation? (Understanding)**

- **Independent variable (IV)** -Elements of the experiment that are manipulated to produce different conditions for comparison. Examples of independent variables in evaluation experiments are interface style, level of help, number of menu items and icon design.
- **Dependent variables** - The variables that can be measured in the experiment, their value is 'dependent' on the changes made to the independent variable. Example is the speed of menu selection.

**31. Define hypothesis? (Understanding)**

A hypothesis is a prediction of the outcome of an experiment. It is framed in terms of the independent and dependent variables, stating that a variation in the independent variable will cause a difference in the dependent variable

**32. What are two different types of variables in experimental evaluation? (Analyze)**

Variables can be classified as either discrete variables or continuous variables.

**Discrete variable:** It can only take a finite number of values or *levels*, for example, a screen color that can be red, green or blue.

**Continuous variable:** It can take any value (although it may have an upper or lower limit), for example a person's height or the time taken to complete a task.

**33. What are two types of query technique in evaluation? (Understanding)**

The two types of query techniques are

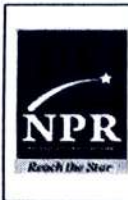
- **Interviews** - Interviewing users about their experience with an interactive system provides a direct and structured way of gathering information
- **Questionnaires** – The questions are fixed in advance and can reach a wider participant group.



**34. Lists some of the standard tests categorized by the form of independent and dependent variables (Analyze)**

Independent variable	Dependent variable	
<i>Parametric</i> Two valued Discrete Continuous	Normal Normal Normal	Student's <i>t</i> test on difference of means ANOVA (Analysis Of Variance) Linear (or non-linear) regression factor analysis
<i>Non-parametric</i> Two valued Discrete	Continuous Continuous	Wilcoxon (or Mann–Whitney) rank-sum test Rank-sum versions of ANOVA





Continuous	Continuous	Continuous Spearman's rank correlation
<i>Contingency tests</i> Two valued Discrete Continuous	Discrete Discrete Discrete	No special test, see next entry Contingency table and chi-squared test (Rare) Group independent variable and then as above

**35. List down factors distinguishing evaluation techniques (Understanding)**

The factors distinguishing evaluation techniques are

- the stage in the cycle at which the evaluation is carried out
- the style of evaluation
- the level of subjectivity or objectivity of the technique
- the type of measures provided
- the information provided
- the immediacy of the response
- the level of interference implied
- the resources required.

**36. What is universal design? (Apr/May '17) (Understanding)**

Universal design is about designing systems so that they can be used by anyone in any circumstance. Universal design means designing for diversity, including:

- people with sensory, physical or cognitive impairment
- people of different ages
- people from different cultures and backgrounds

**37. List the design principles of Universal design (Understanding)**

The design principles of Universal design

- equitable use
- flexibility in use
- simple and intuitive to use
- perceptible information
- tolerance for error
- low physical effort
- size and space for approach and use



**38. Define prototyping (Apr/May '17) (Understand)**

Prototypes are experimental and incomplete designs which are cheaply and fast developed. Prototyping is the process of developing prototypes, is an integral part of iterative user-centered design because it enables designers to tryout their ideas with users and to gather feedback.

**39. Do you think that prototyping will solve all problems associated with user interface design? Give reasons for your answer. (Nov/Dec '17) (Understanding)**

Yes, prototyping will solve all problems associated with user interface design. Creating prototypes allows to improve a design concept quickly. It can iteratively revise and



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## 40. Comment on the usage of colors in emergency response panels. (Nov/Dec '17) (Understanding)

COLOR	MEANING	APPLICATION
Red	Danger	Safety cans and signs.
	Stop	Emergency stop bar or button on machinery. Identification of fire equipment.
Fluorescent Orange, Orange-Red	Biosafety	Labels and containers for blood and infectious waste. (Warning labels must be fluorescent orange or orange-red with the biosafety symbol in a contrasting color.)
Yellow	Caution	Tripping, falling and striking hazards. "Flammable, Keep Fire Away" labels on cabinets. Safety cans and containers for explosives, corrosives or unstable materials.
Orange	Warning	Parts of machinery or energized equipment that may cut, crush or otherwise injure. Inside of transmission guards for pulleys, gears, etc.
Green	Safety	Location of first aid equipment. Location of safety equipment, respirators, safety showers, etc.
Blue	Information	Signs and bulletin boards. Specific railroad warnings against starting, using or moving equipment being repaired.
Black, White, Yellow or Combination of Black with White or Yellow	Boundaries	Traffic or housekeeping markings. Stairways, directions and borders.
Magenta or Purple on Yellow	Radiation Caution	X-ray, alpha, beta, gamma, neutron and proton radiation.

## 41. What is multithreading? (Understand)(April/May 2018)

A technique by which a single set of code can be used by several processors at different stages of execution.

## 42. Write down the three categories of principles to support usability. (Understand)(April/May 2018).

ISO defines usability as "The extent to which a product can be used by specified users





### PART – B

1. Explain in detail the Interaction design process.(Apr/May '17)(Understanding) .(Apr/May '18)
2. Discuss about the Navigation design? (Understanding)
3. Illustrate the iteration and prototyping in interaction design. (Understanding)
4. Explain the software life cycle model in HCI software process.  
(Understanding)
5. What are the techniques used for producing rapid prototypes? Explain.(Analyze)
6. Explain in detail about the four approaches in Expert analysis for evaluation?(Remember)
7. Discuss about the Nielsen's ten heuristics? (Understanding)
8. Elucidate briefly the different observational techniques in evaluation?(Analyze)
9. Explain about the various factors distinguishing evaluation techniques.(Analyze)
10. Discuss about the Multimodal interaction(Understanding)
11. Discuss in detail the design for users with disabilities. (Analyze)
12. (i) Narrate the Shneiderman's eight golden rules of Interface Design  
(Apr/May '17, '18) (Understanding)  
(ii) Outline the approaches used for evaluation through expert analysis.  
(Apr/May '17) (Apply)
13. i) Explain the visual tools available for screen design and layout  
(Remember) NOV/DEC 2018  
ii) Outline the activities involved in waterfall model of software life cycle.(Remember)  
NOV/DEC 2018
14. i) List and explain the factors that influence for choosing an evaluation method(Remember) NOV/DEC 2018
15. ii) Enumerate Norman's seven principles for transferring difficult task to simple one in design? (Remember) NOV/DEC 2018
16. i) Discuss the four phases of interactive design (Remember) (Apr/May 2019)  
ii) How do you evaluate the software design (Remember) (Apr/May 2019)
17. i) Elaborate on the activities involved in the software development life cycle  
(Remember) (Apr/May 2019)
18. ii) State the rules and guidelines for software design (Remember)  
(Apr/May 2019)

### PART C

1. Discuss the principles of good UI design. Evaluate the suitability of the manual tour booking form shown in the figure 1 for automation using the UI design principles. (Nov/Dec '17)(Evaluate)
2. Consider the following usability objective.  
Theatre booking clerks with low motivation, no computing experience and no previous training, working in a small and hectic box office, are able to learn to reserve or book seats within a one hour period. What measures could be taken and which techniques would you consider appropriate to test whether this objective was met? (Nov/Dec '17)(Evaluate)
3. Discuss in detail about the activities in the waterfall model and spiral model of the





## UNIT III - MODELS AND THEORIES

### PART A

**1. What are Competence models and Performance models? (Understanding)**

Competence models represent the kinds of behavior expected of a user, but they provide little help in analyzing that behavior to determine its demands on the user. Performance models provide analytical power mainly by focusing on routine behavior in very limited applications.

**2. Define GOMS(Understanding)**

The *GOMS* model is an acronym for Goals, Operators, Methods and Selection. A *GOMS* description consists of these four elements:

**Goals** These are the user's goals, describing what the user wants to achieve. **Operators** These are the lowest level of analysis. They are the basic actions that the user must perform in order to use the system.

**Methods:** It is decomposition of a goal into subgoals/operators. For instance, in a certain window manager a currently selected window can be closed to an icon either by selecting the 'CLOSE' option from a pop-up menu, or by hitting the 'L7' function key

**Selection:** It is means of choosing between competing methods

**3. What is CCT? (Understanding)**

CCT (Cognitive complexity theory,) has two parallel descriptions: one of the user's goals and the other of the computer system (called the *device* in CCT). The description of the user's goals is based on a *GOMS*-like goal hierarchy, but is expressed primarily using *production rules*. For the system grammar, CCT uses *generalized transition networks*, a form of *state transition network*.

**4. What is BNF? (Understanding)**

BNF (Backus-Naur Form) views the dialog at a purely syntactic level, ignoring the semantics of the language. BNF has been used widely to specify the syntax of computer programming languages, and many system dialogs can be described easily using BNF rules.

**5. What are the two types of description in BNF? (Understanding)**

The names in the description are of two types: *non-terminals*, shown in lower case, and *terminals*, shown in upper case. Terminals represent the lowest level of user behavior, such as pressing a key, clicking a mouse button or moving the mouse. Non-terminals are higher-level abstractions and it is defined in terms of other non-terminals and terminals by a definition of the form

**name ::= expression**

**6. What is Task-action Grammar (TAG) (Understand) (Nov-Dec 2018)** *Task-action grammar (TAG)* attempts to deal with the consistency in the language's structure and in its use of command names and letters by including elements such as parameterized grammar rules.





**7. What is KLM? (Understand)**

KLM (Keystroke-Level Model) uses the human-motor understanding as a basis for detailed predictions about user performance. It is aimed at unit tasks within interaction – the execution of simple command sequences.

**8. How the task of KLM is split? (Understanding)**

The task is split into two phases:

**Acquisition** of the task, when the user builds a mental representation of the task.

**Execution** of the task using the system's facilities.

**9. List the various operators in the execution phase of KLM? (Understanding)**

The model decomposes the execution phase into five different physical motor operators, a mental operator and a system response operator:

**K** -Keystroking, actually striking keys, including shifts and other modifier keys.

**B** -Pressing a mouse button.

**P** -Pointing, moving the mouse (or similar device) at a target

**H** -Homing, switching the hand between mouse and keyboard.

**D** -Drawing lines using the mouse.

**M** -Mentally preparing for a physical action.

**R** -System response which may be ignored if the user does not have to wait for it, as in copy typing.

**10. List the several organizational issues? (Understanding)**

There are several organizational issues that affect the acceptance of technology by users and that must therefore be considered in system design:

- systems may not take into account conflict and power relationships
- those who benefit may not do the work
- not everyone may use systems

**11. What is Three-state model (Understanding)**

The three state models contain three states – State 0, State 1, State 2. The devices like mouse, trackball, light pen though they are similar from the application's viewpoint, they have very different sensory-motor characteristics. The *three-state model*, captures some of these crucial distinctions.

For example for a light pen, when its button is not depressed, it is in state 1, and when its button is down, state 2. The light pen has a third state, when it is not touching the screen. In this state the system cannot track the light pen's position. This is called state 0.

**Light Pen Transitions**





**12. Who are stakeholders? (Understanding)**

A stakeholder can be defined as anyone who is affected by the success or failure of the system.

**13. Who are stakeholders? Mention the types? (Understand) (Apr/May 2019)**

**Primary** stakeholders are people who actually use the system – the end-users. **Secondary** stakeholders are people who do not directly use the system, but receive output from it or provide input to it (for example, someone who receives a report produced by the system). **Tertiary** stakeholders are people who do not fall into either of the first two categories but who are directly affected by the success or failure of the system (for example, a director whose profits increase or decrease depending on the success of the system).

**14. Define Custom Methodology? (Understanding)**

CUSTOM focuses on establishing stakeholder requirements (all stakeholders are considered, not just the end-users). It is applied at the initial stage of design when a *product opportunity* has been identified, so the emphasis is on capturing requirements. It is a forms-based methodology, providing a set of questions to apply at each of its stages.

**15. List the six stages of Custom analysis? (Remember)**

There are six key stages to carry out in a CUSTOM analysis

- Describe organizational context, including primary goals, physical characteristics, political and economic background
- Identify and describe stakeholders including personal issues, role in the organization and job
- Identify and describe work-groups whether formally constituted or not
- Identify and describe task-object pairs i.e. tasks to be performed and objects used
- Identify stakeholder needs: stages 2-4 described in terms of both current and proposed system - stakeholder needs are identified from the differences between the two
- Consolidate and check stakeholder requirements against earlier criteria

**16. What is Open System Task Analysis (OSTA)? (Understanding)**

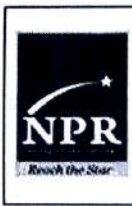
OSTA is a socio-technical approach, which attempts to describe what happens when a technical system is introduced into an organizational work environment. Like CUSTOM, OSTA specifies both social and technical aspects of the system.

**17. List the eight stages of Open System Task Analysis? (Analyze)**

There are eight stages to carry out OSTA

- Primary task identified in terms of users' goals
- Task inputs to system identified
- External environment into which the system will be introduced is described, including physical, economic and political aspects
- Transformation processes within the system are described in terms of actions performed on or with objects
- Social system is analyzed, considering existing internal and external work-groups and relationships





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## 18. Define Soft Systems Methodology (SSM) (Understanding)

Soft systems methodology (SSM) arises from the same tradition but takes a view of the organization as a system of which technology and people are components.

## 19. List the seven stages of Soft Systems Methodology (Analyze)

The seven stages of Soft Systems Methodology

- recognition of problem and initiation of analysis
- detailed description of problem situation
  - rich picture
- generate root definitions of system
  - CATWOE
- conceptual model - identifying transformations
- compare real world to conceptual model
- identify necessary changes
- determine actions to effect changes

## 20. List the elements of root definitions? (Understanding)

Root definitions are described in terms of specific elements, summarized using the acronym, CATWOE:

**Clients** – those who receive output or benefit from the system.

**Actors** – those who perform activities within the system.

**Transformations** – the changes that are effected by the system. This is a critical part of the root definition as it leads to the activities that need to be included in the next stage. These 'transform' the inputs of the system into the required outputs.

**Weltanschauung** – (from the German) meaning world view. This is how the system is perceived in a particular root definition.

**Owner** – those to whom the system belongs, to whom it is answerable and who can authorize changes to it.

**Environment** – the world in which the system operates and by which it is influenced

## 21. What is participatory design? (Understanding)

*Participatory design* is a philosophy that encompasses the whole design cycle. It is design in the workplace, where the user is involved not only as an experimental subject or as someone to be consulted when necessary but as a member of the design team. Users are therefore active collaborators in the design process, rather than passive participants whose involvement is entirely governed by the designer

## 22. What are the three levels of participation in Effective Technical and Human Implementation of Computer-based Systems (ETHICS) (Analyze)

**Consultative** – the weakest form of participation where participants are asked for their opinions but are not decision makers.

**Representative** – a representative of the participant group is involved in the decision making process.

**Consensus** – all stakeholders are included in the decision-making process

## 23. Define Ethnography? (Understanding)

Ethnography is based on very detailed recording of the interactions between people and between people and their environment. It has a special focus on social relationships and how they affect the nature of work.







**24. List the various levels of communication? (Understanding)**

The various levels of communication are

- a. Face-to-face communication
- b. Conversation
- c. Text based communication
- d. Group working

**25. What is back channel in face-to-face communication? (Understanding)**

A back channel is a sound or gesture like nods, grimaces, shrugs of the shoulder and small noises made to give continuity to a conversation by a person who is listening to another.

**26. What are the uses for theories of conversation in CSCW (computer-supported cooperative work)? (Understanding)**

There are three uses for theories of conversation in CSCW.

1. They can be used to analyze transcripts, for example from an electronic conference. This can help us to understand how well the participants are coping with electronic communication.
2. They can be used as a guide for design decisions – an understanding of normal human-human conversation can help avoid blunders in the design of electronic media.
3. They can be used to drive design – structuring the system around the theory

**27. What is meant by utterances and adjacency pairs? (Understanding)** The speech within each turn is called an utterance. The utterances of the conversation can be grouped into pairs: a question and an answer, a statement and an agreement. The answer or response will normally follow directly after the question or statement and so these are called adjacency pairs

**PART – B**

1. Write in detail about the Cognitive complexity theory (Understanding)
2. Discuss about Linguistic Models (Understanding)
3. Explain about the various physical models? (Understanding)
4. Explain about the cognitive architecture? (Understanding)
5. Discuss about the various organizational issues. (Analyze)
6. Explain in detail about the various socio-technical models? (Remember)
7. Discuss about the Soft Systems Methodology? (Understanding)
8. Explain in detail about Face-to-Face Communication? (Understanding)
9. Explain about conversation in communication? (Understanding)
10. Discuss about Text based communication? (Analyze)
11. Discuss in detail about hypertext? (Understanding)
12. Explain about the various issues in Web technology? (Analyze)
13. Explain about the static web content? (Understanding)
14. Explain about the dynamic web content? (Understanding)
15. What is a cognitive model? Classify cognitive models and discuss the same. (Apr/May '17) (Remember)





16. (i) Who is a stakeholder? Outline the types of stake holders and appraise the stakeholders for an airline booking system? (Apr/May '17) (Remember) (ii) Explain the stages involved in CUSTOM methodology analysis (Apr/May '17) (Remember)
17. Consider the case of preparing a group presentation for a software project. Describe the stages in specifying and designing UI for the same. (Nov/Dec '17) (Create)
18.
  - i) Explain the concept of key state level model (Remember) (Nov/Dec '18)
  - ii) Describe the stages of Open System Task Analysis (OSTA) (Remember) (Nov/Dec '18)
19.
  - i) What are the four types of textual communication? Explain (Remember) (Nov/Dec '18)
  - ii) Write note on Dynamic web content (Remember) (Nov/Dec '18)
20. With a text editor example, explain the Cognitive Complexity Theory (Apply) (Apr/May 2019)
21. Discuss about text-based communication and the relative merits and features of linear text and hypertext systems (Remember) (Apr 2019)

### PART C

1. How do 'golden rules' and heuristics help interface designers take account of cognitive psychology? Illustrate your answer with the design of Microsoft office word. (Nov/Dec '17) (Analyze)
2. Explain some of the organizational issues that affect the acceptance and relevance of information and communication systems in detail. (Understand) (April/May 2018)
3. Explain the problem space model and interacting cognitive subsystems in detail. (April/May 2018) (Understand)



**UNIT IV –MOBILE HCI  
PART –A**

**1. What is mobile eco system? (Understanding)**

Mobile Ecosystem is collection of multiple devices (mobile phones, Tablet etc), software (operating system, development tools, testing tools etc.), companies (device manufacturers, carrier, apps stores, development/testing companies, etc.) etc., and the process by which data (sms, bank transactions etc.), is transferred /shared by a user from one device to another device or by the device itself based on some programs (Birth day , Wedding Messages , Calendar )

**2. What are the layers of mobile eco system? (Nov/Dec '17)  
(Understanding)**

<b>Services</b>
<b>Applications</b>
<b>Application frameworks</b>
<b>Operating systems</b>
<b>Platforms</b>
<b>Devices</b>
<b>Aggregators</b>
<b>Networks</b>
<b>Operators</b>

**3. Define mobile platform & its types? (or) Identify the categories of mobile platforms? (Apr/May '17) (Understanding)**

A mobile platform

- provide access to the devices.
- run software and services on each of these devices
- is a core programming language in which all of your software is written.three types : 1) licensed, 2) proprietary, 3) open source.

**4. Define & List the licensed platforms (Understanding)**

Licensed platforms are sold to device makers for nonexclusive distribution on devices. The goal is to create a common platform of development Application Programming Interfaces (APIs) that work similarly across multiple devices with the least possible effort required to adapt for device differences. List of licensed platforms are

- Java Micro Edition (Java ME)
- Binary Runtime Environment for Wireless (BREW)
- Windows Mobile
- LiMo





**5. Define & List the proprietary platforms? (Understanding)**

Proprietary platforms are designed and developed by device makers for use on their devices. They are not available for use by competing device makers. List of proprietary platforms

- Palm
- BlackBerry
- iPhone

**6. Define open source platform and give example? (Understanding)**

Open source platforms are mobile platforms that are freely available for users to download, alter, and edit.

Ex: Android is one of these platforms. It is developed by the Open Handset Alliance, which is spearheaded by Google. The Alliance seeks to develop an open source mobile platform based on the Java programming language.

**7. What is Application framework? (Understanding)**

Application frameworks run on top of operating systems, sharing core services such as communications, messaging, graphics, location, security, authentication, and many others. Application frameworks are used to create applications, such as a game, a web browser, a camera, or media player

**8. What is mobile medium type ? (Understanding)**

The mobile medium type is the type of application framework or mobile technology that presents content or information to the user. It is a technical approach regarding which type of medium to use.

**9. What is the mobile application type? (Understanding)**

- SMS
- Mobile Website
- Mobile Web widgets
- Mobile Web application
- Native Applications
- Games

**10. Compare the various mobile application type (Analyze)**

	Devices support	Complexity	User experience	Language	Offline support	Device features
SMS	All	Simple	Limited	N/A	No	None
Mobile websites	All	Simple	Limited	HTML	No	None
Mobile web widgets	Some	Medium	Great	HTML	Limited	Limited
Mobile web applications	Some	Medium	Great	HTML, CSS, JavaScript	Limited	Limited
Native	All	Complex	Excellent	Various	Yes	Yes



**11. Write the pros and cons of game applications (Analyze)Pros**

- They provide a simple and easy way to create an immersive experience.
- They can be ported to multiple devices relatively easily.

**Cons**

- They can be costly to develop as an original game title.
- They cannot easily be ported to the mobile web.

**12. What Is Information Architecture? (Understanding)**

- The structural design of shared information environments
- The combination of organizations, labeling, search, and navigationsystems within websites and intranets.
- The art and science of shaping information products and experiencesto support usability and find ability
- An emerging discipline and community of practice focused on bringingprinciples of design and architecture to the digital landscape

**13. List the disciplines of information architecture (Understanding)**

- Information architecture
- Interaction design
- Information design
- Navigation design
- Interface design

**14. What is site map and give example ? (Understanding)**

Site maps are a classic information architecture deliverable. They visually represent the relationship of content to other content and provide a map forhow the user will travel through the informational space.

**15. Define Click stream (Understanding)**

Click stream is a term used for showing the behavior on websites, displaying the order in which users travel through a site's information architecture, usually based on data gathered from server logs.

**16. What are Wireframes? (Understanding)**

- Wireframes are a way to lay out information on the page, also referred toas information design.
- Site maps show how our content is organized in our informational space;wireframes show how the user will directly interact with it.
- Wireframes lack the capability to communicate more complex, often in-place, interactions of mobile experiences.

**17. List the mobile prototyping?(Understanding)**

- Paper prototypes
- Context prototype
- HTML prototyves





**18. List the Elements of Mobile Design (Understanding)**

1. Context - core to the mobile experience
2. Message - the overall mental impression you create explicitly through visual design
3. Look and Feel – is used to evoke action ,how the user will use an interface
4. Layout – informs how the user will visually process the page
5. Color –
6. Typography- the style and appearance of printed matter
7. Graphics- the images that are used to establish or aid a visual experience.

**19. What are the two distinct types of navigation layouts for mobile devices? (Understanding)**

The two distinct types of navigation layouts for mobile device touch and scroll.

**20. Give the Different devices with color depths (Understanding)**

Bit depth	Supported colors	Description	Example devices
12-bit	4,096 colors	Used with older phones; dithering artifacts in photos can easily be seen.	Nokia 6800
16-bit	65,536 colors	Also known as HighColor; very common in today's mobile devices. Can cause some banding and dithering artifacts in some designs.	HTC G1, BlackBerry Bold 9000, Nokia 6620
Bit depth	Supported colors	Description	Example devices
18-bit	262,144 colors	Used in mobile devices to offer Truecolor (see following entry) levels through dithering. Limited banding may be seen.	Samsung Alias, Sony Ericsson TMS06
24-bit	16.7 million colors	Also known as Truecolor; supports millions of colors and produces little banding.	iPhone, Palm Prē, Nokia N97

**21. Define Iconography (Understanding)**

Iconography is useful to communicate ideas and actions to users in a constrained visual space. The challenge is making sure that the meaning of the icon is clear to the user.

**22. Describe the pros and cons of mobile web sites. (Nov/Dec '17) (Analyze)**

**The Pros:**

1. **A single website.** It's easier to administer just one website for all devices.
2. **A single URL.** This makes sure your users will find you on mobile devices without having to wait for redirects, especially helpful on slower connections.
3. **Easy SEO.** There is no need to create specific content for mobile devices, while you still enjoy the benefits of your desktop website SEO on mobile devices.



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5. **Low cost.** Simple math — one website is cheaper than two.

**The Cons:**

1. **A single website.** Having just one website for all devices may be easy for you, but not always for your users. You will often need to put different emphasis on the same page in order to maximize conversions using the advantages of the platform.
2. **Technical.** As responsive web design is a relatively new technology, there are still some outdated devices with old browsers that will load the website too slowly or even not fully.
3. **User Experience.** Mobile is a completely different experience than desktop, so having a single, even responsive website, may harm your overall UX on both platforms. If you try to satisfy both mobile and desktop users with the same user interface, you may end up satisfying no one.

**23. What is Cocoa Touch? (Remember)(April/May 2018)**

Cocoa Touch is a user interface framework provided by Apple for building software applications for products like iPhone, iPad and iPod Touch. It is primarily written in Objective C language and is based on Mac OS X.)

**PART – B**

1. Describe the following (Understanding)
  - a. Mobile Ecosystem
  - b. Platforms
2. What are Application Framework and explain in detail(Understanding)
3. Appraise the types of mobile applications with examples (Apr/May '17) (Analyze)
4. Explain the various mobile information architecture(Understanding)
5. List and explain the elements of mobile design (Apr/May '17) (Understanding)
6. Explain briefly about mobile information architecture. (Nov/Dec '17) (Understanding)(April/May 2018)
7. i) Describe the roles of major mobile operating system (Remember) (Nov/Dec '18)
  - ii) Tabulate the various mobile design tools and interface tool kits (Remember) (Nov/Dec '18)
8. Elaborate on Mobile application medium types (Remember) (Nov/Dec '18)
9. With neat diagram of mobile ecosystem, discuss its platforms and application frameworks. (Remember) (Apr/May '19)

**PART C**

1. List and explain the elements of mobile interface design. ( Nov/Dec'17) (Apr/May 2019) (Analyze)
2. Discuss the various elements of Mobile Design with a step by step method explain how to design an registration page for movie ticket booking.(Analyze)(April/Mav 2018)





## UNIT V- WEB INTERFACE DESIGN PART – A

### 1. List the events for cueing the user during a drag and drop? (Understanding)

There are at least 15 events available for cueing the user during a drag and drop interaction.

- Page Load
- Mouse Hover
- Mouse Down
- Drag Initiated
- Drag Leaves Original Location
- Drag Re-Enters Original Location
- Drag Enters Valid Target
- Drag Exits Valid Target
- Drag Enters Specific Invalid Target
- Drag Is Over No Specific Target
- Drag Hovers Over Valid Target
- Drag Hovers Over Invalid Target
- Drop Accepted
- Drop Rejected
- Drop on Parent Container

### 2. List few actors in drag and drop? (Understanding)

During each event we can visually manipulate a number of *actors*. The page elements available include:

- Page (e.g., static messaging on the page)
- Cursor
- Tool Tip
- Drag Object (or some portion of the drag object, e.g., title area of a module)
- Drag Object's Parent Container
- Drop Target

### 3. What are the various approaches for Drag and Drop Modules (Understanding) (April/May 2018)

The various approaches for Drag and Drop Modules are:

**Placeholder targeting** - Most explicit way to preview the effect.

**Midpoint boundary** - Requires the least drag effort to move modules around. **Full-size**

**module dragging** - Coupled with placeholder targeting and midpoint boundary detection, it means drag distances to complete a move are shorter. **Ghost rendering** - Emphasizes the page rather than the dragged object. Keeps the preview clear.

### 4. Write the various selection patterns?(Analyze) Toggle

Selection : Checkbox or control-based selection. Collected

Selection: Selection that spans multiple pages.

Object Selection: Direct object selection.

Hybrid Selection: Combination of Toggle Selection and Object Selection





**5. What are contextual tools? (Understanding)**

Contextual Tools are the Web's version of the desktop's right-click menus. Instead of having to right-click to reveal a menu, we can reveal tools in context with the content

**6. State the ways to reveal contextual tools? (Understanding)**

The various ways to reveal contextual tools

**Always-Visible Tools:** Place Contextual Tools directly in the content.

**Hover-Reveal Tools:** Show Contextual Tools on mouse hover.

**Toggle-Reveal Tools:** A master switch to toggle on/off Contextual Tools for the page.

**Multi-Level Tools:** Progressively reveal actions based on user interaction.

**Secondary Menus:** Show a secondary menu (usually by right-clicking on an object).

**7. What are the issues with showing contextual tools in an overlay (Understanding)**

The various issues with showing contextual tools in an overlay:

- Providing an overlay feels heavier. An overlay creates a slight contextual switch for the user's attention.
- The overlay will usually cover other information—information that often provides context for the tools being offered.
- Most implementations shift the content slightly between the normal view and the overlay view, causing the users to take a moment to adjust to the change.
- The overlay may get in the way of navigation. Because an overlay hides at least part of the next item, it becomes harder to move the mouse through the content without stepping into a "landmine."

**8. What is a mutton in contextual tools? (Understanding)**

A variation on Multi-Level Tools is the "mutton" (menu + button = mutton). Muttons are useful when there are multiple actions and we want one of the actions to be the default. Yahoo! Mail uses a mutton for its "Reply" button

**9. Mention the ways in which contextual tools can be used? (Understand)(Apr/May 2019)**

Contextual Tools are useful for reducing the user's path to completing a task. By placing tools near the point of focus and making these tools easy to activate, you can create a lightweight interaction

**10. What are overlays, inlays, virtual pages and process flow? (Understanding)**

**Overlays** - Instead of going to a new page, a mini-page can be displayed in a lightweight layer over the page.

**Inlays** - Instead of going to a new page, information or actions can be inlaid within the page.

**Virtual Pages** - By revealing dynamic content and using animation, we can extend the virtual space of the page.

**Process Flow** - Instead of moving from page to page, sometimes we can create a flow within a page itself.





**11. What are the types of overlays? (Apr/May '17) (Understanding)**

The three specific types of overlays are Dialog Overlays, Detail Overlays, and Input Overlays

**12. What is Light box effect? (Understanding)**

It is one technique employed in dialog overlays. In photography a lightbox provides a backlit area to view slides. On the Web, this technique has come to mean bringing something into view by making it brighter than the background. In practice, this is done by dimming down the background

**13. What is Modal and Non-Modal (Understanding)**

A modal dialog box must be closed (hidden or unloaded) before you can continue working with the rest of the application. For example, a dialog box is modal if it requires you to click OK or Cancel before you can switch to another form or dialog box.

Non-Modal dialog boxes allows to shift the focus between the dialog box and another form without having to close the dialog box.

**14. What is List Inlay? (Understanding)**

Lists are a great place to use Inlays. Instead of requiring the user to navigate to a new page for an item's detail or popping up the information in an Overlay, the information can be shown with a List Inlay in context.

**15. What is Accordion? (Understanding)**

The Accordion is an interface element that employs the List Inlay pattern to show only one open panel in a list at a time.

**16. Give some guidelines for use of inlays and overlays?(Remember)**

- Use an overlay when there may be more than one place a dialog can be activated from (the exception may be showing details for items in a list).
- Use an overlay to interrupt the process.
- Use an overlay if there is a multi-step process.
- Use an inlay when you are trying to avoid covering information on the page needed in the dialog.
- Use an inlay for contextual information or details about one of many items (as in a list): a typical example is expanding list items to show detail.

**17. Mention the patterns that supports Virtual pages?(Remember)(Apr/May 2019)**

Patterns that support virtual pages include:

- Virtual Scrolling
- Inline Paging
- Scrolled Paging
- Panning
- Zoomable User Interface







**18. Give examples for virtual Scrolling to manage the virtualspace (Understanding)**

Virtual Scrolling demonstrate three different ways to manage the virtual space:

- Yahoo! Mail creates the illusion that all data has been loaded up-front byhaving the scrollbar reflect the total virtual space.
- Microsoft Live Search creates the virtual illusion as the user moves downthrough the search results.
- And PicLens does the same with the caveat that it shows a virtual window inthe larger virtual space (by only providing a scroller control for where the user is and some before and after context).

**19. What is Carousel? (Understanding)**

A Carousel provides a way to page-in more data by scrolling it into view. On one hand it is a variation on the Virtual Scrolling pattern. In other ways it is like Virtual Paging since most carousels have paging controls. The additional effectis to animate the scrolled content into view.

**20. List some issues in Virtual panning (Understanding)**

Issues in Virtual Panning are 1) Natural Visual Construct 2) Gestures

**21. What is the main difference between Flicking and virtualpanning (Understanding)**

*Flicking* is similar to panning yet has some differences. With Virtual Panning the canvas only moves while the mouse is dragging it around. With flicking, if the user starts the dragging operation and releases, the canvas will continue movingwith some momentum. The canvas slows in such a way as to mimic real-world forces.

**22. What is Zoomable User Interface? (Understanding)**

A Zoom able User Interface (ZUI) is another way to create a virtual canvas. Unlike panning or flicking through a flat, two-dimensional space, a ZUI allows the user to also zoom in to elements on the page. This freedom of motion in both2D and 3D supports the concept of an infinite interface.

**23. What is a Google Blogger (Understanding)**

The site Google Blogger generally makes easy to create and publish blogs. Onething it does not make easy, though, is deleting comments that others may leave on your blog. This is especially difficult when you are the victim of hundreds ofspam comments left by nefarious companies hoping to increase their search ranking.

**24. How to delete the comment in a Blogger? (Understanding)**

Blogger forces you to delete these comments through a three-step process. Eachstep is an individual page, all punctuated with a page refresh

**25. List the various patterns of process flow? (Understanding)**

The various Process Flow patterns are

- Interactive Single-Page Process







- Configuration Process
- Overlay Process
- Static Single-Page Process

**26. List some of the Best Practices for Static Single-Page Process?**

**(Understanding)**

- Use a multi-page process when the process is complex.
- Use a multi-page process when you want to hide the previous context (and the next) and bring the focus to a single task in the steps.
- Use a Static Single-Page Process when you only have a few steps and want to avoid taking the chance that a user will quit while moving from page to page.
- Use visual treatments to make the number of steps seem fewer.
- Provide clues as to where the user is and how much is left in a multi-step operation.
- Gather as many defaults as possible to simplify a flow.
- Use engagement, color visuals, interactivity, and simple visual styles to make the steps seem fewer.
- Put lightweight tasks up front in a multi-step operation

**27. What is auto complete pattern? (Apr/May '17) (Remember)**

The auto complete pattern is used in combination with a standard input text box that is labeled to match the user's expectation of what field will be searched against. As the user types in data, a list of suggested items that match the inputted data is displayed.

**28. Differentiate between modal and non-modal overlays. (Nov/Dec '17)**

**(Analyze)**

**Modal Windows**

When a window is modal it remains active and focused until the user has finished with it and dismisses it. While it is active no other windows of the same application can be activated. A modal window is therefore normally a child window. The user needs to interact with it before control can be returned to the parent application. In effect the parent application is locked and nothing proceeds until the modal window is closed.

**Non-Modal Windows**

So a non-modal window is the opposite. While it is active you can still activate other windows. The user can switch between windows of the same application. The window being active does not prevent the rest of the application from continuing.

**29. Suggest some of the best practices to keep in mind during the design of input overlay. (Nov/Dec '17) (Remember)**

- Use overlays very sparingly
- Don't suddenly open overlays
- Darken the page behind the overlay
- Allow users to click (or tap) away (most of the time)
- Always provide a clear close option
- Don't include multiple steps



**30. Define object selection. (Remember)(April/May 2018)**

Object–action interface, also abbreviated as OAI, is an extension to the graphical user interface, especially related to direct manipulation user interface and it can help to create better human-computer interfaces and increase the usability of a product.

**31. List any four principles of designing rich web interface? (Remember)(Nov/Dec 2018)**

Some of the principles of designing rich web interface are

- The structure principle
- The simplicity principle
- The tolerance principle
- The feedback principle

**32. What do you mean by Inlay? (Remember) (Nov/Dec 2018)**

Inlays - Instead of going to a new page, information or actions can be inlaid within the page

**PART – B**

1. Discuss in detail the purpose of drag and drop?(Analyze) (Apr/May 2019)
2. Discuss in detail the various types of selection patterns? (Understanding)
3. Explain in detail the various ways to reveal contextual tools? (Understanding)(April/May 2018)
4. Discuss about the three types of overlays? (Understanding) (Apr/May 2019)
5. Discuss about the various types of inlays?(Analyze)
6. Explain in detail about the various patterns that support virtual pages? (Understanding)
7. Discuss in detail about the process flow patterns(Understanding)
8. How are contextual tools used in the design of rich web UI? Illustrate and compare with suitable examples. (Nov/Dec '17)(Analyze)
9. How are virtual pages used in the design of rich web UI? Illustrate and compare with suitable examples. (Nov/Dec '17) (Analyze)
10. Summarize the principles for designing rich web interface. (Apr/May '17) (Analyze)
11. i) Write notes on contextual tools (Remember) (Nov/Dec '18)  
 ii) Brief about the different types of overlays (Remember) (Nov/Dec '18)
12. Explain the steps involved in designing a web interface. (Remember) (Nov/Dec '18)

**PART C**

1. Design a web interface for a "Library Management System". State the functional requirements you are considering. (Apr/May '17) (Create)
2. Write in brief the process flow of web interface design.(April/May 2018)(Remember)
3. Discuss with a person of age above 65 and a child you know under 16 about their experience, attitude, expectations and security concerns of computers. What factors would you take into account if you were designing a website aimed at this person? (Analyze) (Apr/May 2019)

