

## **SYLLABUS**

### **CS5CRT15 : IT & Environment (Core)**

#### **Unit 1: Introduction to Internet and Environment (10 hrs)**

Internet- Internet as a knowledge repository, academic search techniques, creating cyber presence. Academic websites.

Multidisciplinary nature of environmental studies -Definition, scope and importance, Need for public awareness.

#### **Unit 2: Impact of IT in E-Learning (12 hrs.)**

Introduction to use of IT in teaching and learning, Learning Management System-Moodle, Edmodo, etc. Academic services- A note on INFLIBNET, NPTEL, NICNET.

#### **Unit 3 : IT and Society (18 hrs.)**

IT & Society- issues and concerns- digital divide, IT & development, the free software movement.

IT industry: new opportunities and new threats, software piracy, cyber ethics, cybercrime, cyber threats, cyber security, privacy issues, cyber laws, cyber addictions, information overload, health issues- guidelines for proper usage of computers, internet and mobile phones. Impact of IT on language & culture.

#### **Unit 4 : E-waste and Green Computing (14 hrs.)**

E-waste- Problems- Solutions-Impact of e-waste in living beings and environment- a study on e-waste management in India.

Green computing, definition, meaning, scope. Green computing in India.

#### **Unit 5: Human Rights (18 hrs.)**

An Introduction to Human Rights, Meaning, concept and development -History of Human Rights-Different Generations of Human Rights- Universality of Human Rights- Basic International Human Rights Documents - UDHR, ICCPR, ICESCR - Value dimensions of Human Rights.

### **Human Rights and United Nations**

Human Rights co-ordination within UN system- Role of UN secretariat- The Economic and Social Council- The Commission Human Rights-The Security Council and Human rights- The Committee on the Elimination of Racial Discrimination- The Committee on the Elimination of Discrimination Against Women- the Committee on Economic, Social and Cultural Rights- The Human Rights Committee- Critical Appraisal of UN Human Rights Regime.

### **Human Rights National Perspective**

Human Rights in Indian Constitution – Fundamental Rights- The Constitutional Context of Human Rights-directive Principles of State Policy and Human Rights- Human Rights of Women- children –minorities- Prisoners- Science Technology and Human Rights- National Human Rights Commission- State Human Rights Commission- Human Rights Awareness in Education.

### **Case Study:**

The students need to view the film “Samaksham”, a film on environment produced by Mahatma Gandhi University Creations and submit a compulsory assignment reviewing film. The review is considered for internal mark assessment.

## **CONTENTS**

<b>UNIT</b>		<b>Page No.</b>
1	<b>Introduction to Internet and Environment</b>	7-33
2	<b>Impact of IT in E-Learning</b>	34-51
3	<b>IT and Society</b>	52-94
4	<b>E-waste and Green Computing</b>	95-110
5	<b>Human Rights</b>	111-176

## INTRODUCTION TO INTERNET AND ENVIRONMENT

### Internet As A Knowledge Repository

Knowledge is increasingly recognized by most large business organizations to be a primary resource in sustaining competitive advantage. Knowledge sharing has been identified as a key challenge in knowledge management. Many organizations are using the Internet not only as a pool of enormous information but also for supporting information and knowledge sharing.

In the information age, lifelong learning and collaboration are essential aspects of most innovative work. Information technology is not only transforming our workplace but also our educational system. The information revolution is having a profound and permanent effect on the way we learn. Fortunately, the computer technology which drives the information explosion also has the potential to help individuals and teams to learn much of what they need to know on demand. In particular, computer-based systems on the Internet can be designed to capture knowledge as it is

generated within a community of practice and to deliver relevant knowledge when it is useful.

In this internet world, we can search any kind of information. Just type the keyword in search engine and you can find a lot of information about it. The internet is recognized as a rich source of information, which can be easily tapped by any person who has the skills to use the internet. More than ever before online databases are easily accessible to all learners who have a computer and a telephone line.

The rapid development of Information and Communication Technology has yielded an almost unlimited variety of databases and multimedia platforms that are able to supply various needs, including knowledge, edutainment, entertainment, leisure activities, consumer facilities, interpersonal interaction etc. there are many knowledge centers in the net like which can be accessed and used by all. There are virtual library and also on-line discussion boards which are useful tools for academic exchanges. Thus the use of internet by students and teachers is perceived as a vehicle to increase knowledge and skills necessary for successful negotiation of tasks presented by 21st century.

Knowledge repository means a place to store knowledge and retrieve knowledge. Hence internet is truly a knowledge repository.

### **Academic Search Techniques**

As the largest interconnection of computers and computer networks, the World Wide Web makes information widely accessible, but information integrity and management remain

key issues for individuals and firms using this platform. The Internet can provide a wealth of information, but the credibility and accuracy depend entirely on the source, and finding credible information can be time-consuming, requiring hours of sorting through largely irrelevant sites. These difficulties often arise because search engines – "while widely used – are often not wisely used". For many people, arriving at the information desired, rather than at thousands of irrelevant hyperlinks, remains more an art form than a science. The computers are just a tool which helps you to get the information from the net. It cannot think for you. It cannot impart knowledge to you. In this situation, Search Engines are like the index in the back of a book. It helps you to search for specific words and topics. Some of the examples of search engines are: Google, Yahoo, Alta Vista, Excite, Hotbot, Infoseek, etc.

## **GOOGLE**

- Google is a full-text search engine, which uses computerized "spiders" to index millions, sometimes billions, of pages, allowing for much narrower searches than searchable subject index, which searches only the titles and descriptions of sites, and doesn't search individual pages
- Google is case-insensitive. If you search for Three, tHRee, THREE, or even THREE, you get the same results.
- Singular is different from plural. Searches for apple and apples turn up different pages
- The order of words matters. Google considers the first word most important, the second word next, and so on.

- Google ignores most little words, including include "I," "where," "how," "the," "of," "an," "for," "from," "how," "it," "in," and "is.". Google ignores most punctuation, except apostrophes, hyphens, and quote marks.
- Google returns pages that match your search terms exactly.
- Google search word limit is 32.

Some of the academic search techniques in the context of Google search engine are as follows.

### 1. Phrase Searches

- Enter key words search techniques. Google will find matches where the keywords appear anywhere on the page.
- If you want Google to find you matches where the keywords appear together as a phrase, surround them with quotes, like this "search techniques".

### 2. Basic Boolean

- Google's Boolean default is AND, which means that if you enter query words without modifiers, Google will search for all your query words.
- If you prefer to specify that any one word or phrase is acceptable, put an OR (in capital letter), lower case or won't work correctly. For example: enter Yahoo OR Google.
- A computer programming character | can work like OR (e.g. Yahoo | Google)

- If you want to search for a particular term along with two or more other terms, group the other terms within parentheses, like so “search techniques” (Yahoo OR Google).

### **3. Negation**

- If you want to specify that a query item must not appear in your results, prep end a (minus sign or dash): “search techniques” –Google. This will search the pages that contain “search techniques”, but not the word Google
- Note that the symbol must appear directly before the word or phrase that you don’t want. If there’s space between, as in the following query, it won’t work as expected “search techniques” – Google

### **4. Explicit Inclusion**

- Google will search for all the keywords and phrases that you specify, however, there are certain words that Google will ignore because they are considered too common to be of any use in the search (e.g. “a”, “the”, “of”, etc.)
- You can force Google to take a stop word into account by prep ending a + (plus) character, as in +the “search techniques”.

### **5. Synonyms**

- The Google synonym operator, the ~ (tilde) character, prep ended to any number of keywords in your query,

asks Google to include not only exact matches, but also what it thinks are synonyms for each of the keywords. Searching for: ape turns up results for monkey, gorilla, chimpanzee, and others (both singular and plural forms) of the ape or related family, as if you'd searched for: monkey gorilla chimpanzee (Synonyms are bolded along with exact keyword matches on the results page, so they're easy to spot)

## 6. Number Range

- The number range operator, .. (two periods), looks for results that fall inside your specified numeric range (e.g. digital camera 3..5 megapixel \$800..\$1000)
- You can also use the number range syntax with just one number, making it the minimum or maximum of your query (e.g. digital camera ..5 megapixel \$800..)

## 7. Simple Searching and Feeling Lucky

- The I'm Feeling Lucky™ button is a thing of beauty. Rather than giving you a list of search results from which to choose, you're whisked away to what Google believes is the most relevant page given your search (i.e., the first result in the list). Entering Washington Post and clicking the I'm Feeling Lucky button takes you directly to <http://www.washingtonpost.com>.

Searching Within Your Results help you narrow down your results to find the really relevant pages within your results pages.

## **Cyber Presence**

Cyber presence is the way an individual and/or organization presents itself within the cyber domain i.e., Internet. It's important to recognize and actively participate in the cyber domain. Failure to properly present yourself and/or organization could damage your reputation and assist in the failure of your organization.

Successful cyber presence involves many activities:

- Website
- Social Media
- SEO(Search Engine Optimization)
- SEM(Search Engine Marketing)
- and more...

For cyber presence one must have the ability to:

- Communicate
- Share data, information, knowledge
- Interact with other entities and capabilities
- Market itself

There are many agencies works with you to properly establish your cyber presence. Creating a website is a powerful communication tool to begin your cyber presence.

A website is a unique way to communicate with the world! Whether you choose to create a website to share your passion, get people to know your business, sell products or any other reason, there are no boundaries to what you can do! With a website, a ton of possibilities are open to you!

The internet is the ideal media to get in touch with a broad audience at a limited cost.

A website will give you:

- The perfect business card for your enterprise
- A detailed and permanent ad
- A place that's open 24/7 all year round
- Increased competitiveness
- Better responsiveness
- Increased credibility

### Academic websites

Educational websites can include websites that have games, videos or topic related resources that act as tools to enhance learning and supplement classroom teaching. These websites help make the process of learning entertaining and attractive to the student, especially in today's age.

While there are many advantages of such websites, we also need to be aware of the negatives. Students need to be guided properly. Without proper guidance, students may find resources and content that are not reliable or do not align with the direction of the teaching in class. Some websites are huge and offer a massive variety of games and resources. Students may be easily distracted on such websites and end up spending time on activities that are either below their level or do not complement or add to the classroom teaching. Unrestricted access and freedom on the internet can be dangerous, especially for younger students.

Following are some websites used for academic purposes:

**1. EdX: [edx.org](https://www.edx.org)**

This website can be most preferred by the students as it was founded by Harvard University and MIT in 2012. EdX is an online learning destination and MOOC provider, offering high-quality courses from the world's best universities and institutions to learners everywhere. Out of the 90 universities, it includes top global rankers.

**2. Academic Earth: [academicearth.org](https://www.academicearth.org)**

The website gives huge array of academic options to student from traditional to contemporary studies. They provide online degree courses from accounting and economics to engineering and also carries material on niche subjects like behavioural psychology. Moreover, it has have a collaboration with a bunch of reputed colleges such as University of Oxford, Massachusetts Institute of Technology, Stanford University and many other. Keeping in mind the interest level of the students, the portal has videos and podcasts in all the subjects.

**3. Internet Archive: [archive.org](https://www.archive.org)**

From anything to everything, internet archive is an authentic website storing the originals from various big websites. For example, American libraries include the collection of free book directly attached with the college libraries' websites. This is one of the best websites imparting free and accessible knowledge. However, it does not give admission or certificates for learning.

#### 4. Big Think: [bigthink.com](http://bigthink.com)

Big Think has over 2,000 fellows who have received great fame in their forte. These experts write articles and record tutorials for the students, later the content is further refined by the editorial team of the website, giving authentic material to the students. Students can make great use of this website by creating their own distinct ideology, as it provide various opinions on one subject. Moreover, students can get views from experts as well.

#### 5. Coursera: [coursera.org](http://coursera.org)

The moment a student opens this website, he is bound to get sucked into the number of courses available in his topic of interest. It is a user-friendly website. Students can find big universities and a sharable electronic Course Certificate. "Courses include recorded video lectures, auto-graded and peer-reviewed assignments, and community discussion forums. When you complete a course, you'll receive a sharable electronic Course Certificate," assures the website.

#### 6. Brightstorm: [brightstorm.com](http://brightstorm.com)

High school scholars can use this site for reference, rather an interactive reference website, which will mitigate their learning problems. Of course, it is not easy for a student to comprehend the intricate technical terminologies, so the website is making the textbooks easier for students. They provide help in all subjects from mathematics to science, history and other subjects. Entrance exams are generally quite gruelling for students, and this website can solve the problem. They have arranged the topics symmetrically, clearing the air and structure of the competitive exams.

## **7. CosmoLearning: [cosmolearning.com](http://cosmolearning.com)**

Unlike other websites, this portal provides academic as well as skill-based learning to the students. Students can either refer to the material being provided or enrol themselves in any of the 58 courses. The website is synthesised with three main options, including educational material, courses and documentaries. The subjects have been divided into two sections, namely extra-curricular and academic subjects.

## **8. Futures Channel: [thefutureschannel.com](http://thefutureschannel.com)**

This is not just an online portal, but an educational channel for the learners. Unlike other websites, it only represent the significant data catering the problems faced by students. For example, students generally face problem in algebra, so they have created special section for the same.

## **9. Howcast: [howcast.com](http://howcast.com)**

It's a one-stop website for all the subjects, none of the above portals have these many arenas. Keeping the essence of inquisitiveness alive, the portal functions on the common key words including the word 'how'.

## **10. Khan Academy: [khanacademy.org](http://khanacademy.org)**

Khan Academy is an online coaching website. Students who cannot afford a coaching can refer to this website. It gives a win-win situation to the students by giving them the liberty to learn on their pace, as it has a personalised dashboard to gauge the progress report. It has all the traditional school subjects including math, science, computer programming, history, art history, economics, and more. Moreover, it has lessons from kindergarten to calculus, all at one stop. To

enhance the content for the students, it has partnered with NASA, the Museum of Modern Art, the California Academy of Sciences, and MIT. Also, the content is available in 36 languages.

## Multidisciplinary nature of environmental studies

### Definition

Environmental studies deals with every issue that affects an organism. It is essentially a multidisciplinary approach that brings about an appreciation of our natural world and human impacts on its integrity. It is an applied science as it seeks practical answers to making human civilization sustainable on the earth's finite resources. Its components include biology, geology, chemistry, physics, engineering, sociology, health, anthropology, economics, statistics, computers and philosophy.

### Scope

As we look around at the area in which we live, we see that our surroundings were originally a natural landscape such as a forest, a river, a mountain, a desert, or a combination of these elements. Most of us live in landscapes that have been heavily modified by human beings, in villages, towns or cities. But even those of us who live in cities get our food supply from surrounding villages and these in turn are dependent on natural landscapes such as forests, grasslands, rivers, seashores, for resources such as water for agriculture, fuel wood, fodder, and fish. Thus our daily lives are linked with our surroundings and inevitably affects them. We use water to drink and for other day-to-day activities. We breathe

air, we use resources from which food is made and we depend on the community of living plants and animals which form a web of life, of which we are also a part. Everything around us forms our environment and our lives depend on keeping its vital systems as intact as possible.

Our dependence on nature is so great that we cannot continue to live without protecting the earth's environmental resources. Thus most traditions refer to our environment as 'Mother Nature' and most traditional societies have learned that respecting nature is vital for their livelihoods. This has led to many cultural practices that helped traditional societies protect and preserve their natural resources. Respect for nature and all living creatures is not new to India. All our traditions are based on these values.

Emperor Ashoka's edict proclaimed that all forms of life are important for our well being in Fourth Century BC.

Over the past 200 years however, modern societies began to believe that easy answers to the question of producing more resources could be provided by means of technological innovations. For example, though growing more food by using fertilizers and pesticides, developing better strains of domestic animals and crops, irrigating farmland through mega dams and developing industry, led to rapid economic growth, the ill effects of this type of development, led to environmental degradation.

The industrial development and intensive agriculture that provides the goods for our increasingly consumer oriented society uses up large amounts of **natural resources** such as

water, minerals, petroleum products, wood, etc. **Nonrenewable resources**, such as minerals and oil are those which will be exhausted in the future if we continue to extract these without a thought for subsequent generations. **Renewable resources**, such as timber and water, are those which can be used but can be regenerated by natural processes such as regrowth or rainfall. But these too will be depleted if we continue to use them faster than nature can replace them. For example, if the removal of timber and firewood from a forest is faster than the regrowth and regeneration of trees, it cannot replenish the supply. And loss of forest cover not only depletes the forest of its resources, such as timber and other non-wood products, but affect our water resources because an intact natural forest acts like a sponge which holds water and releases it slowly. Deforestation leads to floods in the monsoon and dry rivers once the rains are over.

Such multiple effects on the environment resulting from routine human activities must be appreciated by each one of us, if it is to provide us with the resources we need in the long-term. Our natural resources can be compared with money in a bank. If we use it rapidly, the capital will be reduced to zero. On the other hand, if we use only the interest, it can sustain us over the longer term. This is called **sustainable utilization or development**.

### Importance

Environment is not a single subject. It is an integration of several subjects that include both Science and Social Studies. To understand all the different aspects of our environment we need to understand biology, chemistry,

physics, geography, resource management, economics and population issues. Thus the scope of environmental studies is extremely wide and covers some aspects of nearly every major discipline.

We live in a world in which natural resources are limited. Water, air, soil, minerals, oil, the products we get from forests, grasslands, oceans and from agriculture and livestock, are all a part of our life support systems. Without them, life itself would be impossible. As we keep increasing in numbers and the quantity of resources each of us uses also increases, the earth's resource base must inevitably shrink. The earth cannot be expected to sustain this expanding level of utilization of resources. Added to this is misuse of resources. We waste or pollute large amounts of nature's clean water; we create more and more material like plastic that we discard after a single use; and we waste large amount of food, which is discarded as garbage. Manufacturing processes create solid waste byproducts that are discarded, as well as chemicals that flow out as liquid waste and pollute water, and gases that pollute the air. Increasing amounts of waste cannot be managed by natural processes. These accumulate in our environment, leading to a variety of diseases and other adverse environmental impacts now seriously affecting all our lives. Air pollution leads to respiratory diseases, water pollution to gastro-intestinal diseases, and many pollutants are known to cause cancer.

Improving this situation will only happen if each of us begins to take actions in our daily lives that will help preserve our environmental resources. We cannot expect Governments

alone to manage the safeguarding of the environment, nor can we expect other people to prevent environmental damage. We need to do it ourselves. It is a responsibility that each of us must take on as ones own.

### Need for public awareness

As the earth's natural resources are reducing and our environment is being increasingly degraded by human activities, it is evident that something needs to be done. We often feel that managing all this is something that the Government should do. But if we go on endangering our environment, there is no way in which the Government can perform all these clean-up functions. It is the prevention of environment degradation in which we must all take part that must become a part of all our lives. Just as for any disease, prevention is better than cure. To prevent ill-effects on our environment by our actions, is economically more viable than cleaning up the environment once it is damaged. Individually we can play a major role in environment management. We can reduce wasting natural resources and we can act as watchdogs that inform the Government about sources that lead to pollution and degradation of our environment.

This can only be made possible through mass public awareness. Mass media such as newspapers, radio, television, social media, strongly influence public opinion. However, someone has to bring this about. If each of us feels strongly about the environment, the press and media will add to our efforts. Politicians in a democracy always respond positively to a strong publicly supported movement. Thus if you join an NGO that supports conservation, politicians will make green policies. We are living on spaceship earth with a limited supply

of resources. Each of us is responsible for spreading this message to as many people as possible.

Suggested further activities for concerned students:

- Join a group to study nature, such as WWFI or BNHS, or another environmental group.
- Begin reading newspaper articles and periodicals such as 'Down to Earth', WWF-I newsletter, BNHS Hornbill, Sanctuary magazine, etc. that will tell you more about our environment. There are also several environmental websites.
- Lobby for conserving resources by taking up the cause of environmental issues during discussions with friends and relatives. Practice and promote issues such as saving paper, saving water, reducing use of plastics, practicing the 3Rs principle of reduce, reuse, recycle, and proper waste disposal.
- Join local movements that support activities such as saving trees in your area, go on nature treks, recycle waste, buy environmentally friendly products.
- Practice and promote good civic sense such as no spitting or tobacco chewing, no throwing garbage on the road, no smoking in public places, no urinating or defecating in public places.
- Take part in events organized on World Environment Day, Wildlife Week, etc.
- Visit a National Park or Sanctuary, or spend time in whatever nature you have near your home.
- Create a social media group about this issue, and give maximum exposure to the public.

## Institutions in environment

There have been several Government and Nongovernment organizations that have led to environmental protection in our country. They have led to a growing interest in environmental protection and conservation of nature and natural resources. The traditional conservation practices that were part of ancient India's culture have however gradually disappeared. Public awareness is thus a critical need to further environmental protection. Among the large number of institutions that deal with environmental protection and conservation, a few well-known organizations include government organizations such as the BSI and ZSI, and NGOs such as BNHS, WWF-I, etc.

- **Bombay Natural History Society (BNHS), Mumbai**

BNHS began as a small society of six members in 1883. It grew from a group of shikaris and people from all walks of life into a major research organization that substantially influenced conservation policy in the country. The influence on wildlife policy building, research, popular publications and peoples action have been unique features of the multifaceted society. Undoubtedly its major contribution has been in the field of wildlife research. It is India's oldest conservation research based NGO and one that has acted at the forefront of the battle for species and ecosystems. The BNHS publishes a popular magazine called Hornbill and also an internationally well-known Journal on Natural History. Its other publications include the Salim Ali Handbook on birds, JC Daniel's book of Indian Reptiles, SH Prater's book of Indian Mammals and PV Bole's book of Indian Trees. One of its greatest scientists was

Dr. Salim Ali whose ornithological work on the birds of the Indian subcontinent is world famous. The BNHS has over the years helped Government to frame wildlife related laws and has taken up battles such as the 'Save the Silent Valley' campaign.

- **World Wide Fund for Nature (WWF-I), New Delhi**

The WWF-I was initiated in 1969 in Mumbai after which the headquarters were shifted to Delhi with several branch offices all over India. The early years focused attention on wildlife education and awareness. It runs several programs including the Nature Clubs of India program for school children and works as a think tank and lobby force for environment and development issues.

- **Center for Science and Environment (CSE), New Delhi**

Activities of this Center include organizing campaigns, holding workshops and conferences, and producing environment related publications. It published a major document on the 'State of India's Environment', the first of its kind to be produced as a Citizen's Report on the Environment. The CSE also publishes a popular magazine, 'Down to Earth', which is a Science and Environment fortnightly. It is involved in the publication of material in the form of books, posters, video films and also conducts workshops and seminars on biodiversity related issues.

- **CPR Environmental Education Centre, Madras**

The CPR EEC was set up in 1988. It conducts a variety of programs to spread environmental awareness and creates an interest in conservation among the general public. It focused

attention on NGOs, teachers, women, youth and children to generally promote conservation of nature and natural resources. Its programs include components on wildlife and biodiversity issues. CPR EEC also produces a large number of publications.

- **Centre for Environment Education (CEE), Ahmedabad**

The Centre for Environment Education, Ahmedabad was initiated in 1989. It has a wide range of programs on the environment and produces a variety of educational material. CEE's Training in Environment Education {TEE} program has trained many environment educators.

- **Bharati Vidyapeeth Institute of Environment Education and Research (BVIEER), Pune**

This is part of the Bharati Vidyapeeth Deemed University. The Institute has a PhD, a Masters and Bachelors program in Environmental Sciences. It implements a large outreach programme that has covered over 135 schools in which it trains teachers and conducts fortnightly Environment Education Programs. Biodiversity Conservation is a major focus of its research initiatives. It develops low cost Interpretation Centres for Natural and Architectural sites that are highly locale specific as well as a large amount of innovative environment educational material for a variety of target groups. Its unique feature is that it conducts environment education from primary school level to the postgraduate level.

- **Uttarkhand Seva Nidhi (UKSN), Almora**

The Organization is a Nodal Agency which supports NGOs in need of funds for their environment related activities. Its major program is organizing and training school teachers to

use its locale specific Environment Education Workbook Program. The main targets are linked with sustainable resource use at the village level through training school children. Its environment education program covers about 500 schools.

- **Kalpavriksh, Pune**

This NGO, initially Delhi based, is now working from Pune and is active in several other parts of India. Kalpavriksh works on a variety of fronts: education and awareness; investigation and research; direct action and lobbying; and litigation with regard to environment and development issues. Its activities include talks and audio-visuals in schools and colleges, nature walks and outstation camps, organizing student participation in ongoing campaigns including street demonstrations, pushing for consumer awareness regarding organic food, press statements, handling green alerts, and meetings with the city's administrators. It is involved with the preparation of site-specific, environmental manuals for schoolteachers. Kalpavriksh was responsible for developing India's National Biodiversity Strategy and Action Plan in 2003.

- **Salim Ali Center for Ornithology and Natural History (SACON), Coimbatore**

This institution was Dr. Salim Ali's dream that became a reality only after his demise. He wished to support a group of committed conservation scientists on a permanent basis. Initially conceived as being a wing of the Bombay Natural History Society (BNHS) it later evolved as an independent organisation based at Coimbatore in 1990. It has instituted a variety of field programs that have added to the country's information on our threatened biodiversity.

- **Wildlife Institute of India (WII), Dehradun**

This Institution was established in 1982, as a major training establishment for Forest Officials and Research in Wildlife Management. Its most significant publication has been 'Planning A Wildlife Protected Area Network for India' (Rodgers and Panwar, 1988). The organization has over the years added an enormous amount of information on India's biological wealth. It has trained a large number of Forest Department Officials and Staff as Wildlife Managers. Its M.Sc. Program has trained excellent wildlife scientists. It also has an Environment Impact Assessment (EIA) cell. It trains personnel in eco-development, wildlife biology, habitat management and Nature interpretation.

- **Botanical Survey of India (BSI)**

The Botanical Survey of India (BSI) was established in 1890 at the Royal Botanic Gardens, Calcutta. However it closed down for several years after 1939 and was reopened in 1954. In 1952 plans were made to reorganise the BSI and formulate its objectives. By 1955 the BSI had its headquarters in Calcutta with Circle Offices at Coimbatore, Shillong, Pune and Dehra Dun. Between 1962 and 1979, offices were established in Allahabad, Jodhpur, Port Blair, Itanagar and Gangtok. The BSI currently has nine regional centres. It carries out surveys of plant resources in different regions

- **Zoological Survey of India (ZSI)**

The ZSI was established in 1916. Its mandate was to do a systematic survey of fauna in India. It has over the years collected 'type specimens' on the bases of which our animal life has been studied over the years. Its origins were collections based at the Indian Museum at Calcutta, which was

established in 1875. Older collections of the Asiatic Society of Bengal, which were made between 1814 and 1875, as well as those of the Indian Museum made between 1875 and 1916 were then transferred to the ZSI. Today it has over a million specimens! This makes it one of the largest collections in Asia. It has done an enormous amount of work on taxonomy and ecology. It currently operates from 16 regional centers.

- **National Mission for Clean Ganga(NMCG)**

It was reregistered as a society on 12 August 2011 under to societies registration act 1860. It acted as implementation ARM OF National Ganga River Basin Authority (NGRBA) , which was constituted under the provisions of the environment protection act 1986. NGRBA has since been dissolved with effect for the 7 October 2016, consequent to constitution of National Council for Rejuvenation, protection and management of river Ganga. The act five tier structure national, state and district level to take measures for prevention , control and abatement of environmental pollution in river ganga and to ensure continuous adequate flow of water so as to rejuvenate the river Ganga.

## **People in Environment**

There are several internationally known environmental thinkers. Among those who have made landmarks, the names that are usually mentioned are Charles Darwin, Ralph Emerson, Henry Thoreau, John Muir, Aldo Leopold, Rachel Carson and EO Wilson. Each of these thinkers looked at the environment from a completely different perspective.

- **Charles Darwin** wrote the 'Origin of Species', which brought to light the close relationship between habitats

and species. It brought about a new thinking of man's relationship with other species that was based on evolution. Alfred Wallace came to the same conclusions during his work.

- **Ralph Emerson** spoke of the dangers of commerce to our environment way back in the 1840s.
- **Henry Thoreau** in the 1860s wrote that the wilderness should be preserved after he lived in the wild for a year. He felt that most people did not care for nature and would sell it off for a small sum of money.
- **John Muir** is remembered as having saved the great ancient sequoia trees in California's forests. In the 1890s he formed the Sierra club, which is a major conservation NGO in the USA.
- **Aldo Leopold** was a forest official in the US in the 1920s. He designed the early policies on wilderness conservation and wildlife management. In the 1960s.
- **Rachel Carson** published several articles that caused immediate worldwide concern on the effects of pesticides on nature and mankind. She wrote a well-known book called 'Silent Spring' which eventually led to a change in Government policy and public awareness.
- **EO Wilson** is an entomologist who envisioned that biological diversity was a key to human survival on earth. He wrote 'Diversity of Life' in 1993, which was awarded a prize for the best book published on environmental issues. His writings brought home to the world the risks to mankind due to man made disturbances in natural ecosystems that are leading to the rapid extinction of species at the global level.

There have been a number of individuals who have been instrumental in shaping the environmental history in our country. Some of the well-known names in the last century include environmentalists, scientists, administrators, legal experts, educationists and journalists.

- **Salim Ali's** name is synonymous with ornithology in India and with the Bombay Natural History Society (BNHS). He also wrote several great books including the famous 'Book of Indian Birds'. His autobiography, 'Fall of a Sparrow' should be read by every nature enthusiast. He was our country's leading conservation scientist and influenced environmental policies in our country for over 50 years.
- **Indira Gandhi** as PM has played a highly significant role in the preservation of India's wildlife. It was during her period as PM, that the network of PAs grew from 65 to 298! The Wildlife Protection Act was formulated during the period when she was PM and the Indian Board for Wildlife was extremely active as she personally chaired all its meetings. India gained a name for itself by being a major player in CITES and other International Environmental Treaties and Accords during her tenure. BNHS frequently used her good will to get conservation action initiated by the Government.
- **S P Godrej** was one of India's greatest supporters of wildlife conservation and nature awareness programs. Between 1975 and 1999, SP Godrej received 10 awards for his conservation activities. He was awarded the Padma Bhushan in 1999. His friendship with people in power combined with his deep commitment for conservation led to his playing a major advocacy role for wildlife in India.

- **M S Swaminathan** is one of India's foremost agricultural scientists and has also been concerned with various aspects of biodiversity conservation both of cultivars and wild biodiversity. He has founded the MS Swaminathan Research Foundation in Chennai, which does work on the conservation of biological diversity.
- **Madhav Gadgil** is a well-known ecologist in India. His interests range from broad ecological issues such as developing Community Biodiversity Registers and conserving sacred groves to studies on the behavior of mammals, birds and insects. He has written several articles, published papers in journals and is the author of 6 books.
- **M C Mehta** is undoubtedly India's most famous environmental lawyer. Since 1984, he has filed several Public Interest Litigations for supporting the cause of environmental conservation. His most famous and long drawn battles supported by the Supreme Court include protecting the Taj Mahal, cleaning up the Ganges River, banning intensive shrimp farming on the coast, initiating Government to implement environmental education in schools and colleges, and a variety of other conservation issues.
- **Anil Agarwal** was a journalist who wrote the first report on the 'State of India's Environment' in 1982. He founded the Center for Science and Environment which is an active NGO that supports various environmental issues.
- **Medha Patkar** is known as one of India's champions who has supported the cause of downtrodden tribal people whose environment is being affected by the dams on the Narmada river.

➤ **Sunderlal Bahugna's** Chipko Movement has become an internationally wellknown example of a highly successful conservation action program through the efforts of local people for guarding their forest resources. His fight to prevent the construction of the Tehri Dam in a fragile earthquake prone setting is a battle that he continues to wage. The Garhwal Hills will always remember his dedication to the cause for which he has walked over 20 thousand kilometers.

### REVIEW QUESTIONS

#### **Part A**

1. What do you mean by knowledge Repository?
2. Give the names of a 4 search engines.
3. What is the use of "I am feeling Lucky" button in search engine.
4. What is cyber presence?
5. What are the activities involved in Cyber presence.
6. Define environmental studies.
7. What is 3R principle in environmental issues.

#### **Part B**

1. Why you can say that "Internet is widely used, not wisely used"?
2. Explain some academic search techniques.
3. Explain the features of any 5 academic web sites.
4. Differentiate Renewable and Non-renewable resources.
5. What you mean by sustainable utilization of resources.
6. Explain the importance of public awareness in Environmental studies.
7. Explain about some institutions in Environment.
8. Explain the activities of some well-known Environmental thinkers.

#### **Part C**

1. Explain the multidisciplinary nature of Environmental studies.

## IMPACT OF IT IN E-LEARNING

### Introduction to use of IT in teaching and learning

Information technologies have affected every aspect of human activity and have a potential role to play in the field of education and training, specially, in distance education to transform it into an innovative form of experience. The need of new technologies in teaching learning process grows stronger and faster. The information age becomes an era of knowledge providing sound and unmatched feasibility for discovery, exchange of information, communication and exploration to strengthen the teaching learning process. Information technologies help in promoting opportunities of knowledge sharing throughout the world. These can help the teachers and students having up-to-date information and knowledge. Accurate and right information is necessary for effective teaching and learning; and information technologies are "set of tools that can help provide the right people with the right information at the right time." Students are independent and they can make best decisions possible about their studies, learning time, place and resources. Students

are able to work in collaborative and interactive learning environments effectively communicating, sharing information and exchanging ideas and learning experiences with all in the environment.

The effective **Use of Technology** in Education has changed the face of education and it has created more educational opportunities. Both teachers and students have benefited from various **educational technologies**, teachers have learned how to integrate technology in their classrooms and students are getting more interested in **learning with technology**. The **use of technology in education** has removed educational **boundaries**, both students and teachers can collaborate in real time using advanced educational technologies.

Technology has helped in the growth of mobile learning and long distance learning. The use of internet technology has enabled teachers to reach students across boarders and also students from developing countries have used internet technology to subscribe for advanced educational courses. Many universities and colleges have embraced online education by creating virtual classrooms. Online **education** is flexible and affordable, students can attend classrooms during their free time, and they can also have a chance to interact with other students virtually.

Recent advancements in educational technologies have yielded positive results in our education sector. This new educational technology is supporting both teaching and learning processes, technology has digitized classrooms

through digital learning tools like, computers, iPads, smartphones, smart digital white boards; it has expanded course offerings, it has increased student's engagement and motivation towards learning.

## **Advantages Of Technology In Education**

### **1. Technology Unlocks Educational Boundaries:**

Technology supports Virtual or Online Learning. Unlike physical classrooms, online learning is flexible and students from different geographical locations can attend the same class with no need of traveling from those locations. Advancement in virtual technology has supported face-to-face communication between students and teachers in the virtual world. In this case, students can easily ask their remote based educators' questions using virtual communication tools like **SKYPE**. Online education is a new wave in our education environment and it has made many educational courses and material accessible to anyone in the world. Many colleges and universities are blending their educational systems with online learning tools, this helps students of these institutions learn from anywhere.

### **2. Technology Simplifies Access to Educational Resources:**

Technology helps students gain access to open educational resources. These resources are kept under the public domain and are freely available to anyone over the world-Wide-Web. These educational resources include electronic books (e-books) , pod-casts, digital libraries, educational games, educational videos and instructions, tutorials and much more. Teachers have

embraced video hosting platforms like Youtube, to upload recorded lectures, so that students who missed lectures can access them from anywhere. Also the **use of cell phones for educational purposes**, helps students and teachers access educational information using Edtech Apps . Teachers are also using lesson videos and clips online to learn how other educators are using technology in classroom and education, these techniques and approaches uploaded by other educators promote self-training and they help many teachers when it comes to integrating technology in their own classrooms. Website like **TeacherTube, Youtube, O2 Learn**, are providing free online lessons and videos to students, these videos have been created and uploaded by teachers and experienced educators.

3. **Technology Motivates Students:** The use of computer based instructions makes students feel in control of what they learn. Students find it easy to learn with technology because **computers** are patient compared to humans. Teachers publish educational instructions on classroom **blogs** or they assign research work via email, and this gives a student time to study on their own and have no fear of making mistakes during the process of learning. Also the use of Gamification educational technologies has increased students interest in learning, teachers use educational puzzles and video games to teach students how to solve different academic challenges, this all process makes students love to learn.

4. **Technology Improves Students Writing and Learning Skills:** The use of computers in the classroom has helped

many students learn how to write well composed sentences and paragraphs. Computers have word processing applications which students use to take notes in the classroom, these word processing applications have built-in dictionaries which help students auto-correct spelling errors and also correct their grammar in a sentence. Also students using English teaching software and mobile applications like BUSUU. Many students have used BUSUU APP to learn different languages online and they can also get access to grammar guides provided by experienced publishers. Teachers encourage their students to create personal blogs using free blog publishing services like BLOGGER & WORDPRESS, students use these blogs to express themselves and share with friends, this process helps students learn how to write creative blog posts.

5. **Technology makes subjects easy to learn:** Different types of educational software are designed to help students learn various subjects easier. Many students complain that learning *Maths* is difficult, so some of them have decided to use educational *Maths* software like BrainingCamp. Students can use BrainingCamp to apply their Math knowledge and skills to solve different math equations. BrainingCamp.com makes learning *maths* very interesting. Also students use math learning games to learn new skills of solving math equations. Websites like IXL.COM, learninggamesforkids.com, help students of different grades to learn simple *maths* basics. Teachers and students can take advantage of sites like Edalive.com; they create powerful educational software that motivates students to learn in a fun way.

6. **Promotes Individual Learning:** Technological tools like cell phones and internet give students an opportunity to learn by themselves. Many students prefer teaching themselves and discovering content by themselves, this process allows them to test various options to solve a given task at school. Students use interactive educational games and software to develop different academic skills. For example; Art and design students can use Photoshop software to learn different design and editing skills, the process of learning how to use Photoshop is tricky, but the more mistakes and trials a student makes, the better they become at using Photoshop. Also the **use of cell phones** as educational tools encourages students to download educational podcasts which they can listen to while at home.
7. **Supports Differentiated Instructions:** Teachers can use technology to cater for each and every student's needs in the classroom or outside of the classroom. The use of classroom assessment software and performance tracking programs helps teachers plan for each student basing on their performance and learning capabilities. Teachers can be in position to classify students and know their weakness and strength as far as education is concerned. Teachers can use mobile applications like PollEverywhere.com to get student's response on any topic or subject. Social collaboration tools like Piazza.com can help teachers create virtual classroom and assign research work or answer student's questions from anywhere.
8. **Increases Collaboration between Teachers and Students:** The use of advanced communication technologies in education helps teachers reach their

students easily and it also helps students reach their teachers or fellow students in real-time. Teachers can use mobile texting applications like Remind101.com to text students about an upcoming test or to assign them research topics. Educational social networks like ePals.com connect students with experienced educators; social bookmarking sites like Pinterest.com help students collaborate and follow creative teachers and educators from around the world. This flexibility in interaction and communication between teachers and students helps the students improve on their grades.

#### **9. Prepares Students for Tomorrows Technological Jobs:**

**Jobs:** As the world develops, every job in the future will require applicants to have some technical skills. So the use of technology in education prepares our children for tomorrow's advanced working conditions. Students use computers in the classroom to develop creative applications which can be used on cell phones or tablets for educational purposes. The advantages of knowing how to use a computer are limitless, so the more time a student spends using various technological tools at school, the more experienced and creative they become. According to research, the most popular jobs today will be of no value in the next 5-10 years, because technology will automate most of these tasks, so it is better to equip our children with technical skills so that they create their own jobs.

#### **10. Increases Students Innovation and Creativity:**

Many teachers have discovered that integrating technology in their classroom increases student's engagement in the

classroom. So now they put up technological competitions where students can make small educational technologies like robots, smart-pens, mobile applications and much more. These technological competitions in schools have increased the level of creativity and innovation among students. Technology teaches students how to solve challenges and get ready for more difficult tasks in life.

### **Learning Management System**

With the revolution in invention of technology, information technology, in particular, has brought a tremendous change in the nature of teaching learning at this new century.

LMS refers to Learning Management System, which is a software application that automates the teaching learning, giving instructions and notifications, administration, tracking and reporting of any course offered by the university.

A dynamic LMS should provide the following services to the academic institutions

- Allows synchronous and asynchronous communication among students, teachers and guardians.
- Automates teaching learning process and provides support to the administrative staff to maintain a smooth operation.
- Supports portability of content/instructions and ensures access from the furthest corner.
- Personalizes content and enables knowledge to reuse
- Offers the option of editing and saving materials

More importantly, an LMS should have the capacity of integrating with other enterprise application solutions used by HR and accounting, enabling management to measure the impact, effectiveness, and overall cost of educational initiatives.

## Moodle

Moodle is an acronym for '**Modular Object-Oriented Dynamic Learning Environment**' and was originally developed by Martin Dougaimas in 2002. Today Moodle has been adopted by over 230 countries where Moodle communities thrive. As an open source platform, Moodle users benefit from a global community of developers who are actively engaged in improving the user experience.

Moodle is the world's most popular and most used learning management system. The Moodle Learning Management System (LMS) is a flexible, open source and free to download learning management solution. With 100 million users (and growing) and over 100,000 Moodle sites deployed worldwide, this user-friendly eLearning platform serves the learning and training needs of all types of organizations in more than 225 countries worldwide.

Moodle 1.0 was officially released in 2002 and originated as a platform to provide educators with the technology to provide online learning in personalized environments that foster interaction, inquiry and collaboration. In private Moodle sites, educators, trainers and employers can create and deliver online courses to help their audiences achieve their learning goals.

Today, Moodle is used by organizations of all shapes and sizes outside of the education community. Most commonly, Moodle is used by businesses, corporations, hospitals and non-profits for training, online learning and in some cases it is used for extended business processes.

Here is a brief list of everything we've seen Moodle being used for:

- Compliance Training
- Onboarding and Related-training
- Competency-based Training and Management
- Workplace Safety Training
- Online Learning and Continuing Education Opportunities
- Online Course Development
- Product and Service Launches
- Communities of Practice and Communities of Expertise

## **Edmodo**

Edmodo is an educational website that takes the ideas of a social network and refines them and makes it appropriate for a classroom. Using Edmodo, students and teachers can reach out to one another and connect by sharing ideas, problems, and helpful tips. A teacher can assign and grade work on Edmodo; students can get help from the entire class on Edmodo. It is a safe environment. There is no bullying or inappropriate content, because the teacher can see everything that is posted on Edmodo. Also parents can join the class to

bring a level of transparency that is difficult to achieve without technology. All in all Edmodo is a great companion to just about any class.

**Edmodo** is a cloud-based **learning management** application for teachers to connect and collaborate with parents and students. The solution allows teachers to create academic groups, distribute assignments and homework, schedule online tests and track student performance.

### **Academic Services**

The term academic services may refer to a wide variety of instructional methods, educational services, or school resources provided to students in the effort to help them accelerate their learning progress, catch up with their peers, meet learning standards, or generally succeed in institutions. When the term is used in educational contexts without qualification, specific examples, or additional explanation, it may be difficult to determine precisely what "academic services" is referring to. The terms support or supports may also be used in reference to any number of academic-support strategies. The following are some of academic support bodies:-

### **INFLIBNET**

Information and Library Network (INFLIBNET) is an autonomous inter-university Centre (IUC) of University Grants Commission, Government of India. It is involved in creating infrastructure for sharing of library and information resources and services among Academic and Research Institutions. INFLIBNET works collaboratively with Indian university libraries to shape the future of the academic libraries in the evolving information environment.

This major National Programme was initiated by UGC in 1991 with its Head Quarters at Gujarat University Campus, Ahmadabad. It became an independent Inter-University Centre in 1996. N-list is the major utility service of INFLIBNET aiming to provide instant access to a rich and diverse collection of electronic academic journals to its users. INFLIBNET is involved in modernizing university libraries in India and connecting them as well as information centres in the country through a nation-wide high speed data network using the technologies for the optimum utilization of information. INFLIBNET is set out to be a major player in promoting scholarly communication among academicians and researchers in India.

This network linked libraries of learned institutions like Universities and Colleges in India. It also covered institutions affiliated to CSIR, ICMR, ICAR, DRDO and other more departments. This network is hybrid of satellite based and terrestrial communication system. It has been designed with the services offered like online services, online catalogue, database services, electronic document supplies and collection development etc. A national node has been set up at Ahmedabad to coordinate the network activities. The INFLIBNET has offered its services to more than 200 Universities, 7500 colleges, 30 research institutes and more than 250 libraries affiliated to various organizations. Its central node has been connected to regional nodes, which hold Union Catalogue and databases. It is a national Centre serving research institutes, academic institutes and also coordinating other networks.

INFLIBNET provide following facilities:

- (i) Catalogue based service,
- (ii) Database service,
- (iii) Document supply service,
- (iv) Collection development,
- (v) Communication based services.
  - (a) Referral services,
  - (b) E-mail services,
  - (c) Bulletin Board services,
  - (d) Audio/Video services,
  - (e) Conferencing services.

The main aim of INFLIBNET has been to establish a pool to share the electronic resources and making their optimum use. Its object is to develop infrastructure of libraries and information Centre's to provide maximum service to their users.

### **NPTEL**

NPTEL is an acronym for National Programme on Technology Enhanced Learning which is an initiative by seven Indian Institutes of Technology (IIT Bombay, Delhi, Guwahati, Kanpur, Kharagpur, Madras and Roorkee) and Indian Institute of Science (IISc) for creating course contents in engineering and science. NPTEL as a project originated from many deliberations between IITs, Indian Institutes of Management (IIMs) and Carnegie Mellon University (CMU) during the years 1999-2003. A proposal was jointly put forward by five IITs (Bombay, Delhi, Kanpur, Kharagpur and Madras) and IISc

for creating contents for 100 courses as web based supplements and 100 complete video courses, for forty hours of duration per course. Web supplements were expected to cover materials that could be delivered in approximately forty hours. Five engineering branches (Civil, Computer Science, Electrical, Electronics and Communication and Mechanical) and core science programmes that all engineering students are required to take in their undergraduate engineering programme in India were chosen initially. Contents for the above courses were based on the model curriculum suggested by All India Council for Technical Education (AICTE) and the syllabi of major affiliating Universities in India.

### **Objectives of NPTEL**

The basic objective of science and engineering education in India is to devise and guide reforms that will transform India into a strong and vibrant knowledge economy. In this context, the focus areas for NPTEL project have been i) higher education, ii) professional education, iii) distance education and iv) continuous and open learning, roughly in that order of preference.

- Manpower requirement for trained engineers and technologists is far more than the number of qualified graduates that Indian technical institutions can provide currently. Among these, the number of institutions having fully qualified and trained teachers in all disciplines being taught forms a small fraction. A majority of teachers are young and inexperienced and are undergraduate degree holders. Therefore, it is important for institutions like IITs, IISc, NITs and other leading Universities in India to

disseminate teaching/learning content of high quality through all available media. NPTEL would be among the foremost and an important step in this direction and will use technology for dissemination.

- India needs many more teachers for effective implementation of higher education in professional courses. Therefore, methods for training young and inexperienced teachers to enable them carry out their academic responsibilities effectively are a must. NPTEL contents can be used as core curriculum content for training purposes.
- A large number of students who are unable to attend scholarly institutions through NPTEL will have access to quality content from them.

All those who are gainfully employed in industries and all other walks of life and who require continuous training and updating their knowledge can benefit from well-developed and peer-reviewed course contents by the IITs and IISc.

### NICNET

NICNET(National Informatics Centre Network) is a satellite based national informatics network established in 1987 at Seshagiri. Its aim has been to provide informatics services to State and Central Governments departments and its various organizations. It provides computing and two way data communication infrastructure to aid planning and monitoring of schemes and decision making activities. NICNET consists of three stations:

- (i) Master Earth Station
- (ii) Remote Micro Earth Stations
- (iii) Geo Synchronous Satellite

Master Earth Station is located at CGO Complex, New Delhi. It has 13 meter antenna, network control center and packet switch. Micro Earth station has connectivity with remote to district computers with State computers and also with regional headquarters. NICNET offers specialized computer aided design and computer aided management. It supports X.25 switch with 1200 bps transmission speed and 19.2 KBs receive speed. The present configuration handles 300 packets per second. The host computers are connected with this packet switch. 118 NICNET is currently connected with INTELSAT-V satellite, which functions as relay station between Master Earth Station and Micro Earth Station. Local Area Network with gateway to the NICNET has been developed at the NIC head quarter. NICNET has been extended with more than 500 nodes distributed all over country.

It has following specific features:

- (i) It extends rapid awareness to computerization of different departments.
- (ii) It help in consolidating information for socio-economic developments of district.
- (iii) Each district is connected with State information center.
- (iv) It works as repository of all information systems
- (v) It help in research work.
- (vi) It develop relevant software and hardware tools.

## Major Advantages and special features of NICENET

1. **Internet Classroom Assistant (ICA):** It is a sophisticated communication tool that brings powerful World-Wide-Web based conferencing, personal messaging, document sharing, scheduling, linking and sharing of resources to a variety of learning environments.
2. Anyone can set up a class in minutes and allow others to join. After login, users are presented with a 'heads-up' display of class resources.
3. **Conferencing:** Create your own private, threaded conferencing on topics you make for the class or opt to allow students to create their own topics.
4. **Scheduling:** Put the class schedule on-line. With a seven day advance view on your class homepage, students will have a heads-up display of upcoming assignments and class events.
5. **Document sharing:** Students and teachers have the ability to publish their documents on the NICENET website by using certain simple web-based techniques.
6. **Personal Messaging:** Similar to traditional email but fully integrated with document sharing and conferencing, personal messaging is a great way to communicate with and between individuals in your class, comment privately on conferencing postings or give private feedback on papers or documents published.
7. **Link Sharing:** Share links to relevant Internet resources sorted by topics that you create.

## **REVIEW QUESTIONS**

### **Part A**

1. What is Moodle?
2. What is the use of Edmodo?
3. What is INFLIBNET.
4. What is NICNET.
5. Which are the stations exists for NICNET.
6. What is NPTEL?

### **Part B**

- . Explain the features of Learning management system.
- . Explain the features of Moodle.
- . Explain the features of INFLIBNET.
- . Explain the features of NICNET.
- . What are the objectives of NPTEL.

### **Part C**

- . What are the advantages of using Technology in Education.
- . Explain the features of different Learning management systems.

UNIT

III

## IT AND SOCIETY

### INTRODUCTION

“Information technology (IT) is the science and activity of storing and sending out information by using computers”. Information technology is the technology used to store, manipulate, distribute or create information. The type of information or data is not important to this definition. The technology is any mechanism capable of processing this data.

In other words Information Technology refers to application of computers and telecommunication equipment to store, retrieve, transmit and manipulate data such as networking, hardware, software, the internet or the people that work with these technologies.

Society can be defined as a community, nation, or broad grouping of people having common traditions, institutions, and collective activities and interests.

These groups include the family group, school group, religious group, political group, entertainment groups,

occupational groups, and the community groups. These groups attain distinctive characters and establish normative patterns or expected ways of carrying out activities within the group, which are characteristic of entire society.

Society and information technology are rapidly co-evolving, and often in surprising ways. Society and networked information technology are changing one another. Becoming socialized means learning what kinds of behavior is appropriate in a given social institution. The increasing trend of digitizing and storing our social and intellectual interactions opens the door to new ways of gathering and synthesizing information that was previously disconnected. Information Technology and Society are linked with technological improvements and increased competition.

In this modern day and age, information technology plays a big role in individual life and the society.

With the introduction of computers, the business world was changed forever. Using computers and software, businesses use information technology to ensure that their departments run smoothly. They use information technology in a number of different departments including human resources, finance, manufacturing, and security. Using information technology, businesses have the ability to view changes in the global markets far faster than they usually do.

Since we live in the “information age,” information technology has become a part of our everyday lives, which is a great impact on our society. Every invention has advantages

and disadvantages, we as curious citizen in our society we would to know or interested to the most important effects of information technology in any branch of the society.

Information technology is comprised of computers, networks, mobile and wireless devices, satellite communications, robotics, videotext, cable television, electronic mail, electronic games, and automated office equipment. The information technology in industry also rapidly growing like communications and electronic organizations.

In past decades we have seen changes much faster pace. The rapid pace at which IT is changing means five to ten years from now lifestyles will be a lot different from what they are today. Nowadays in market there is very good products out there beside of hardware and software but in applications. Popular companies like Facebook, Twitter and Google are prove that applications are useful in communication, advertising, and entertainment.... Toppers in device world are Microsoft, Apple and Samsung that are paving the way for the future generation by introducing revolutionary devices and applications.

### **Advantages of Information Technology in the society**

**Globalization** – Means bringing the world closer (in terms of communication not in geographic map). Deeper mean that we can not only share information quickly and efficiently, but we can also bring down barriers of language and geographic boundaries and countries are able to shares ideas and information with each other.

**Communication** – Before many years internet-cafe or making long distance calls or sending mails via post center are pain in the butt... beside of slow it is pretty expensive. Now the technology grows dramatically the communication become cheaper, quicker and much efficient. The internet communications has also opened up to face to face communication and live update streaming not in computer but also in mobile phones and other gadgets.

**Cost effectiveness** – Information technology has helped to computerize the business process thus streamlining businesses to make them extremely cost effective money making machines. This in turn increases productivity which ultimately gives rise to profits that means better pay and less strenuous working conditions.

**Lots of time** – All the online business are open  $24 \times 7$  globally, means most of the business can be open anytime and anywhere. purchasing in different countries are convenient and easier.

**The Birth of New Jobs** – The era of new jobs. Computer programmers, Systems analyzers, Hardware and Software developers and Web designers are just some of the many new employment opportunities created with the help of IT. Probably new more jobs to come in more years.

### **The Disadvantage of Information Technology in the society**

**Unemployment** – While information technology may have streamlined the business process it has also created job

redundancies, downsizing and outsourcing. Means most of the lower and middle jobs have been wipe off causing more people are unemployed.

**Privacy** – The communication are more faster and easier and most of all convenient, this possible through Information Technology. The phone signal and internet connection are good tool for hacking and intercepting communication, resulting of people worry about their privacy that will become public and worst abuse by others.

**Insufficient of job Security** – Industry experts believe that the Internet has made job security a big issue as since technology keeps on changing with each day. This means that one has to be in a constant learning mode, if he or she wishes for their job to be secure.

**Dominant culture** – Another terror for culture, since the technology make the world one global village. Contributed to one culture dominating another weaker one. For example it is now argued that US influences how most young teenagers all over the world now act, dress and behave. Languages too have become overshadowed killing our local and national language, and English is became a primary mode of communication for business and everything else.

### Information Technology in Some Domains

In summary, one can easily see that computer related technologies have a strong impact on the world. These have attracted many students and professionals to the field of information technology. There are thousands of jobs use this technological opportunity that boost work cost and effectiveness. These field include:

- Business
- Medicine
- Science and Engineer
- Education

We found out that the IT efficient in solving complex problems at a very small type, can perform lots of task and operation that the human cannot do. As result of the use of IT we can have cost effectiveness, globalization, communication and new jobs creation. Despite all the advantages the IT faces the disadvantages. Nonetheless, *"like education technology can improve the traditional way of teaching but cannot replace the human touch."*

### Digital divide

Digital divide is a term that refers to the gap between demographics and regions that have access to modern information and communications technology, and those that don't or have restricted access. This technology can include the telephone, television, personal computers and the Internet.

Well before the late 20th century, digital divide referred chiefly to the division between those with and without telephone access; after the late 1990s the term began to be used mainly to describe the split between those with and without Internet access, particularly broadband.

The digital divide typically exists between those in cities and those in rural areas; between the educated and the uneducated; between socioeconomic groups; and, globally, between the more and less industrially developed nations. Even among populations with some access to technology, the

digital divide can be evident in the form of lower-performance computers, lower-speed wireless connections, lower-priced connections such as dial-up, and limited access to subscription-based content.

The reality of a separate-access marketplace is problematic because of the rise of services such as video on demand, video conferencing and virtual classrooms, which require access to high-speed, high-quality connections that those on the less-served side of the digital divide cannot access and/or afford. And while adoption of smartphones is growing, even among lower-income and minority groups, the rising costs of data plans and the difficulty of performing tasks and transactions on smartphones continue to inhibit the closing of the gap.

According to recent studies and reports, the digital divide is still very much a reality today.

## IT & development

Technology is advancing daily. Most of the time, it's iterative: An interesting improvement on a system that came before. But occasionally, new branches of tech develop, offering completely new approaches to solving old problems. New technological developments in IT industry which changes face of the society. Listing out the new developments:

### 1. Blockchain

A **blockchain** is a growing list of records, called *blocks*, which are linked using cryptography. Each block contains a cryptographic hash of the previous block a timestamp, and transaction data.

By design, a blockchain is resistant to modification of the data. It is “an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way”.

## 2. The Internet of Things (IoT)

The next breakthrough will involve the combination of the Internet of Things with other leading technologies like AI and blockchain. Together, these technologies will create transformational value, first in the industrial sector, and then in the consumer market. The results will include improved business decision-making and a better quality of life at work and home.

## 3. Healthcare

Advances in healthcare are desperately needed and are being tackled, whether it be through predictive analysis using genomic data, which can permit the prediction of disease and other people's characteristics, or through novel drug therapeutics such as RNA targeting. The healthcare industry has long been in need of reform and know that tech giants and other companies are entering the sphere to tackle this problem. Gene modification poses the promise to be the next quantum leap in public health protection and that is just the beginning.

## 4. Generative Adversarial Networks

Generative adversarial networks are next. This is a way of pitting two neural networks against each other in order to train one of them to produce new things. For example, it may

generate realistic-looking pictures. We're not quite there yet but we will be soon. When that happens, it could conceivably become impossible to separate real information from false. For better or worse, that will be a very big thing.

## 5. Human and Artificial Neural Networks

The next thing would be a new way to communicate with these new technologies including AI. It could be some new kind of wearable. It might be some mechanism to fit a receiver inside a body, similar to how pets are microchipped. Basically, something to seamlessly connect humans with the immense power of AI.

## 6. Incremental Improvements

Breakthroughs continue to happen each and every day in the technology world. Recently, Fast Field Programmable Gate Arrays were added to Intel processors which will accelerate extreme real-time IO and machine learning. It is not the massive breakthroughs, but these incremental improvements that lower costs, improve efficiency and drive better customer outcomes.

## 7. Quantum Batteries

The ability to store and retrieve orders of magnitude more portable energy will change the world. Today's battery technologies have lagged woefully behind other technology advances. When we break through with dense battery technology, such as applying quantum physics and other methods to get beyond simple chemical-based batteries, it will rock our world and solar power will eclipse fossil fuels.

## Free software movement

The *free software movement (FSM)* or *free/open-source software movement (FOSSM)* or *free/libre open-source software movement (FLOSSM)* is a social movement with the goal of obtaining and guaranteeing certain freedoms for software users, namely the freedom to run the software, to study and change the software, and to redistribute copies with or without changes. Although drawing on traditions and philosophies among members of the 1970s hacker culture and academia, Richard Stallman formally founded the movement in 1983 by launching the GNU Project. Stallman later established the Free Software Foundation in 1985 to support the movement.

The philosophy of the movement is that the use of computers should not lead to people being prevented from cooperating with each other. In practice, this means rejecting “proprietary software”, which imposes such restrictions, and promoting free software, with the ultimate goal of liberating everyone in cyberspace – that is, every computer user. Stallman notes that this action will promote rather than hinder the progression of technology, since “it means that much wasteful duplication of system programming effort will be avoided. This effort can go instead into advancing the state of the art”.

Members of the free software movement believe that all users of software should have the freedoms listed in The Free Software Definition. Many of them hold that it is immoral to prohibit or prevent people from exercising these freedoms and

that these freedoms are required to create a decent society where software users can help each other, and to have control over their computers.

Some free software users and programmers do not believe that proprietary software is strictly immoral, citing an increased profitability in the business models available for proprietary software or technical features and convenience as their reasons.

"While social change may occur as an unintended by-product of technological change, advocates of new technologies often have promoted them as instruments of positive social change." This quote by San Jose State professor Joel West explains much of the philosophy, or the reason that the free source movement is alive. If it is assumed that social change is not only affected, but in some points of view, directed by the advancement of technology, is it ethical to hold these technologies from certain people? If not to make a direct change, this movement is in place to raise awareness about the effects that take place because of the physical things around us. A computer, for instance, allows us so many more freedoms than we have without a computer, but should these technological mediums be implied freedoms, or selective privileges? The debate over the morality of both sides to the free software movement is a difficult topic to compromise respective opposition.

The Free Software Foundation also believes all software needs free documentation, in particular because diligent programmers should be able to update manuals to reflect

modification that they made to the software, but deems the freedom to modify less important for other types of written works. Within the free software movement, the FLOSS Manuals foundation specializes on the goal of providing such documentation. Members of the free software movement advocate that works which serve a practical purpose should also be free.

### **IT Industry : new opportunities and new threats**

As the world becomes more digitalized, companies are transforming to use technology more intelligently and strategically. This is leading to the creation of new jobs in the IT sector, even as some earlier ones evolve or get obsolete. Here, the terms 'evolution' and 'transformation' are critical. Many of the future job roles already exist, yet the responsibilities and tasks within those job roles will morph and change over time. For example, the job role of a security analyst is well-defined. This individual focuses on using Secure Information and Event Management (SIEM) tools, studying threats, managing vulnerabilities and responding to incidents. In the future, the job role of a security analyst will probably remain the same, but new skills or approaches will be required.

The following are a few key job roles of the future in four different spheres of the IT sector—infrastructure, development, security and data. But they will morph over time.

#### **Opportunities in IT infrastructure**

These range from technical support to help desk and service desk worker. The technical support role is described

under IT Service Manager (ITSM). His job role has moved beyond 'break fix' support—it has evolved from PC support to network troubleshooting, mobile phone device support, login and authentication support, and sophisticated troubleshooting. This is a fast-growing job role, and is more vital to companies than ever before. It can be fulfilled by internal IT workers, or by workers who are part of a managed service provider. More jobs are in the areas of cloud, because there is a chronic shortage of cloud-savvy workers. Surveys show that even as companies wish to move to the cloud, they are hindered by the lack of skilled workers. Additional job roles in the sphere of infrastructure include systems engineer or cloud virtualization engineer, Linux administrator and cloud architect.

### **Opportunities in IT development**

These range from data programmer to automation developer and from artificial intelligence (AI) developer to cloud developer.

1. Role of data programmer is analysing data, considering business problems, interpreting data and turning it into information.
2. Automation developer is expected to automate repetitive skills in the workplace. This job role will become important in the future.
3. AI developer will either help create the AI of tomorrow, or leverage AI services for business purposes. The languages will include Python, C++, Java, Prolog and LISP.

4. Cloud developer will use existing cloud tech (Amazon Web Services, Azure, Software as a Service) to create new solutions.

### **Opportunities in IT security**

1. Security analyst: A 'blue team' worker who protects systems from hackers.
2. Vulnerability assessor: Also known as penetration tester, these assessors are the 'red team' who help do test incursions into systems to see where defences have failed.
3. Business continuity or disaster recovery: This job is vital to help firms plan against man-made or natural disasters and events.

### **Opportunities in the sphere of data**

These roles range from jobs in the fields of Analytics, Big Data jobs and Small Data jobs. Lastly, there are essential job roles, regardless of IT function, such as project manager. Tomorrow's project manager would apply ever-more refined ways to initiate, track and evaluate projects. This is because companies are applying project management concepts to help speed time-to-market.

### **IT Industry- Threats**

Modern technology and society's constant connection to the Internet allows more creativity in business than ever before – including the black market. Cybercriminals are carefully discovering new ways to tap the most sensitive networks in the world. Protecting business data is a growing challenge but awareness is the first step. Following are some threats:-

- *Technology with Weak Security* – New technology is being released every day. More times than not, new gadgets have some form of Internet access but no plan for security. This presents a very serious risk – each unsecured connection means vulnerability.
- *Social Media Attacks* – Cybercriminals are influencing social media as a medium to distribute a complex geographical attack called “water holing”. The attackers identify and infect a cluster of websites they believe members of the targeted organization will visit.
- *Mobile Malware* – Security experts have seen risk in mobile device security since the early stages of their connectivity to the Internet. The minimal mobile obscene play among the long list of recent attacks has users far less concerned than they should be. Considering our culture's unbreakable reliance on cell phones and how little cybercriminals have targeted them, it creates a catastrophic threat.
- *Third-party Entry* – Cybercriminals prefer the path of least resistance. Target is the poster child of a major network attack through third-party entry points. The global retailer's HVAC vendor was the unfortunate contractor whose credentials were stolen and used to steal financial data sets for 70 million customers.
- *Neglecting Proper Configuration* – Big data tools come with the ability to be customized to fit an organization's needs. Companies continue to neglect the importance of properly configuring security settings. The New York Times recently fell victim to a data breach as a result of enabling only

one of the several critical functionalities needed to fully protect the organization's information<sup>4</sup>.

- *Outdated Security Software* – Updating security software is a basic technology management practice and a mandatory step to protecting big data. Software is developed to defend against known threats. That means any new malicious code that hits an outdated version of security software will go undetected.
- *Social Engineering* – Cybercriminals know intrusion techniques have a shelf life. They have turned to reliable non-technical methods like social engineering, which rely on social interaction and psychological manipulation to gain access to confidential data. This form of intrusion is unpredictable and effective.
- *Lack of Encryption* – Protecting sensitive business data in transit and at rest is a measure few industries have yet to embrace, despite its effectiveness. The health care industry handles extremely sensitive data and understands the gravity of losing it – which is why HIPAA\* compliance requires every computer to be encrypted.

\***HIPAA** (Health Insurance Portability and Accountability Act of 1996) is United States legislation that provides data privacy and security provisions for safeguarding medical information.

- *Corporate Data on Personal Devices* – Whether an organization distributes corporate phones or not, confidential data is still being accessed on personal devices. Mobile management tools exist to limit functionality but securing the loopholes has not made it to the priority list for many organizations.

- *Inadequate Security Technology* – Investing in software that monitors the security of a network has become a growing trend in the enterprise space. The software is designed to send alerts when intrusion attempts occur, however the alerts are only valuable if someone is available to address them. Companies are relying too heavily on technology to fully protect against attack when it is meant to be a managed tool.

### Software Piracy

Software piracy is the stealing of legally protected software. Under copyright law, software piracy occurs when copyright protected software is copied, distributed, modified or sold. Software piracy is considered direct copyright infringement when it denies copyright holders due compensation for use of their creative works.

Software piracy is the illegal copying, distribution, or use of software. It is such a profitable “business” that it has caught the attention of organized crime groups in a number of countries. According to the Business Software Alliance (BSA), about 36% of all software in current use is stolen.

There Are Five Main Types of Software Piracy. They are:

#### 1. Counterfeiting

This type of piracy is the illegal duplication, distribution and/or sale of copyrighted material with the intent of imitating the copyrighted product. In the case of packaged software, it is common to find counterfeit copies of the compact discs incorporating the software programs, as well as related

packaging, manuals, license agreements, labels, registration cards and security features.

## 2. Internet Piracy

This occurs when software is downloaded from the Internet. The same purchasing rules apply to online software purchases as for those bought in compact disc format. Common Internet piracy techniques are:

- Websites that make software available for free download or in exchange for others
- Internet auction sites that offer counterfeit or out-of-channel software
- Peer-to-peer networks that enable unauthorized transfer of copyrighted programs

## 3. End User Piracy

This occurs when an individual reproduces copies of software without authorization. These include:

- Using one licensed copy to install a program on multiple computers
- Copying discs for installation or distribution
- Taking advantage of upgrade offers without having a legal copy of the version to be upgraded.
- Acquiring academic or other restricted or non-retail software without a proper license
- Swapping discs in or outside the workplace

## 4. Client-Server Overuse

This type of piracy occurs when too many users on a network are using a central copy of a program at the same

time. If you have a local-area network and install programs on the server for several people to use, you have to be sure your license entitles you to do so. If you have more users than allowed by the license, that's "overuse."

### 5. Hard-Disk Loading

This occurs when a business sells new computers with illegal copies of software loaded onto the hard disks to make the purchase of the machines more attractive.

### Cyber Ethics

Cyber ethics is the study of ethics pertaining to computers, covering user behavior and what computers are programmed to do, and how this affects individuals and society. For years, various governments have enacted regulations while organizations have explained policies about cyber ethics.

With the increase of young children using the internet, it is now very essential than ever to tell children about how to properly operate the internet and its dangers. It is especially hard to talk to teens because they do not want to be lectured about what is right and wrong. They seem to think they have it all sorts out. That is why it is important to instill appropriate cyber etiquette at an early age but if you haven't there is still time to tell to your child.

Cyber ethics concerns to the code of responsible behavior on the Internet. Just as we are taught to act responsibly in everyday life. The responsible behavior on the internet in many ways aligns with all the right behavior in everyday life, but the results can be significantly different.

Some people try to hide behind a false sense of anonymity on the internet, believing that it does not matter if they behave badly online because no one knows who they are or how to search them. That is not all the time true; browsers, computers and internet service providers may keep logs of their activities which can be used to spot illegal or inappropriate behavior.

The Government has taken a positive role in making resources for parents and children to learn about cyber ethics. This is a growing problem and without parents and teachers using the resources available nothing can be done to prepare future generations of internet users from being safe online.

### Cybercrime

Cybercrime, or computer-oriented crime, is a crime that involves a computer and a network. The computer may have been used in the commission of a crime, or it may be the target. Cybercrimes can be defined as: "Offences that are committed against individuals or groups of individuals with a criminal motive to intentionally harm the reputation of the victim or cause physical or mental harm, or loss, to the victim directly or indirectly, using modern telecommunication networks such as Internet (networks including chat rooms, emails, notice boards and groups) and mobile phones (Bluetooth/SMS/MMS)". Cybercrime may threaten a person or a nation's security and financial health. Issues surrounding these types of crimes have become high-profile, particularly those surrounding hacking, copyright infringement, unwarranted mass-surveillance, sextortion, child pornography, and child grooming.

There are also problems of privacy when confidential information is intercepted or disclosed, lawfully or otherwise.

Debarati Halder and K. Jaishankar further define cybercrime from the perspective of gender and defined 'cybercrime against women' as "Crimes targeted against women with a motive to intentionally harm the victim psychologically and physically, using modern telecommunication networks such as internet and mobile phones". Internationally, both governmental and non-state actors engage in cybercrimes, including espionage, financial theft, and other cross-border crimes. Cybercrimes crossing international borders and involving the actions of at least one nation state is sometimes referred to as cyber warfare.

A report (sponsored by McAfee), published in 2014, estimated that the annual damage to the global economy was \$445 billion. Approximately \$1.5 billion was lost in 2012 to online credit and debit card fraud in the US. In 2018, a study by Center for Strategic and International Studies (CSIS), in partnership with McAfee, concludes that close to \$600 billion, nearly one percent of global GDP, is lost to cybercrime each year.

### **Cyber threats**

A cyber or cyber security threat is a malicious act that seeks to damage data, steal data, or disrupt digital life in general. Cyber-attacks include threats like computer viruses, data breaches, and Denial of Service (DoS) attacks.

There are ten common types of cyber threats:

1. Malware. Software that performs a malicious task on a target device or network, e.g. corrupting data or taking over a system.

2. Phishing. An email-borne attack that involves tricking the email recipient into disclosing confidential information or downloading malware by clicking on a hyperlink in the message.
3. Spear Phishing. A more sophisticated form of phishing where the attacker learns about the victim and impersonates someone he or she knows and trusts.
4. "Man in the Middle" (MitM) attack. Where an attacker establishes a position between the sender and recipient of electronic messages and intercepts them, perhaps changing them in transit. The sender and recipient believe they are communicating directly with one another. A MitM attack might be used in the military to confuse an enemy.
5. Trojans. Named after the Trojan Horse of ancient Greek history, the Trojan is a type of malware that enters a target system looking like one thing, e.g. a standard piece of software, but then lets out the malicious code once inside the host system.
6. Ransomware. An attack that involves encrypting data on the target system and demanding a ransom in exchange for letting the user have access to the data again. These attacks range from low-level nuisances to serious incidents like the locking down of the entire city of Atlanta's municipal government data in 2018.
7. Denial of Service attack or Distributed Denial of Service Attack (DDoS). Where an attacker takes over many (perhaps thousands) of devices and uses them to invoke the functions of a target system, e.g. a website, causing it to crash from an overload of demand.

8. Attacks on IoT Devices. IoT devices like industrial sensors are vulnerable to multiple types of cyber threats. These include hackers taking over the device to make it part of a DDoS attack and unauthorized access to data being collected by the device. Given their numbers, geographic distribution and frequently out-of-date operating systems, IoT devices are a prime target for malicious actors.
9. Data Breaches. A data breach is a theft of data by a malicious actor. Motives for data breaches include crime (i.e. identity theft), a desire to embarrass an institution (e.g. Edward Snowden or the DNC hack) and espionage.
10. Malware on Mobile Apps. Mobile devices are vulnerable to malware attacks just like other computing hardware. Attackers may embed malware in app downloads, mobile websites or phishing emails and text messages. Once compromised, a mobile device can give the malicious actor access to personal information, location data, financial accounts and more.

## Cyber security

Cyber security refers to the body of technologies, processes, and practices designed to protect networks, devices, programs, and data from attack, damage, or unauthorized access. Cyber security may also be referred to as information technology security.

Cyber security is important because government, military, corporate, financial, and medical organizations collect, process, and store unprecedented amounts of data on computers and other devices. A significant portion of that data

can be sensitive information, whether that be intellectual property, financial data, personal information, or other types of data for which unauthorized access or exposure could have negative consequences. Organizations transmit sensitive data across networks and to other devices in the course of doing businesses, and cyber security describes the discipline dedicated to protecting that information and the systems used to process or store it. As the volume and sophistication of cyber-attacks grow, companies and organizations, especially those that are tasked with safeguarding information relating to national security, health, or financial records, need to take steps to protect their sensitive business and personnel information. The nation's top intelligence officials cautioned that cyber-attacks and digital spying are the top threat to national security, eclipsing even terrorism.

For an effective cyber security, an organization needs to coordinate its efforts throughout its entire information system. Elements of cyber encompass all of the following:

- Network security
- Application security
- Endpoint security
- Data security
- Identity management
- Database and infrastructure security
- Cloud security
- Mobile security
- Disaster recovery/business continuity planning
- End-user education

The most difficult challenge in cyber security is the ever-evolving nature of security risks themselves. Traditionally, organizations and the government have focused most of their cyber security resources on perimeter security to protect only their most crucial system components and defend against known threats. Today, this approach is insufficient, as the threats advance and change more quickly than organizations can keep up with. As a result, advisory organizations promote more proactive and adaptive approaches to cyber security. Similarly, the National Institute of Standards and Technology (NIST) issued guidelines in its risk assessment framework that recommend a shift toward continuous monitoring and real-time assessments, a data-focused approach to security as opposed to the traditional perimeter-based model. (*The perimeter is the border between one network and another. Creating a security perimeter, then, can be defined as placing the necessary safeguards at the entrance of a privately owned network to secure it from hackers.*)

## Privacy Issues

Privacy interest in cyber security involves establishing protocols and effective oversight regarding when, why, and how government agencies may gain access to personal information that is collected, retained, used, or shared. U.S. businesses and government share responsibility for the insecurity of consumer online personal information. There is no single federal minimum standard for data protection that enforces fair information practices (FIPs). Fair information practices regulate and enforce consumer privacy rights regarding data collection, retention, use, and sharing of

personal information. The federal approach has focused not on the protection of personal information, but on the purpose of the information collection.

The history of U.S. government agencies conducting sanctioned and unsanctioned surveillance of domestic communication by planning with telecommunications and wire communication companies is well known. (*The Puzzle Palace, Inside the National Security Agency America's Most Secret Intelligence Organization* (1983)- James Bamford) Domestic surveillance first began as a means of acquiring information on criminal activities and quickly moved to documenting people's engagement in social or political activities and their exercise of constitutionally protected rights to expression and assembly. Fundamentally, control of society is, in large part, about the ability of government to control communications.

One key challenge facing digital communications users is that this medium suits those inclined to spy unlike any other form of surveillance because the intruder can hide the fact that a communication has been compromised.

### Cyber laws

In technology driven society, internet has huge contribution for the growth of humans. Many investigators explained that cyberspace is a physical space but actually were a computer-generated construction representing abstract data. It is a virtual medium. It has no boundaries, no geographical mass, or gravity. Numerous advancements are done due to cyber activities but the major question is that whether it should be regulated or not. Cyber Law is the law

that controls cyber space. Cyber space is a very broad term and includes computers, networks, software, and data storage devices such as hard disks, USB disks, the Internet, websites, emails and even electronic devices such as cell phones, ATM machines. The increased dependence of individuals and organizations on cyberspace has resulted in many cybercrimes.

Cyber crimes are illegal acts where the computer is used either as a tool or a target or both. The massive growth in electronic commerce (e-commerce) and online share trading has led to an unusual erupt in incidents of cybercrime. Although, there is system to protect devices from infected with computer virus to the data and computer networks such as firewalls, antivirus software, and other technological solutions, but in India efforts must be done towards effective use of these technologies to protect the valuable data and to combat cybercrime. Even expert users of IT tools may not be aware of cyber victimization. Along with the progression in technology it is similarly important to be aware of cyber-crime and other related issues thereof. The cyber safety depends on the knowledge of the technology and the care taken while using internet and that of the defensive measures adopted by user and servers systems. Cyber law portrays the legal issues associated with the use of communications technology, mainly "cyberspace", i.e. the Internet. It is a junction of numerous legal fields, including intellectual property, privacy, freedom of expression, and jurisdiction. It is established that cyber law applies to regulations designed for the physical world, to human activity on the Internet. Cyber law basically deals with almost all aspects of transaction and activities concerning Internet, World Wide Web and Cyberspace in India.

The law for cyberspace is to control the man and the machine. The fundamental goal of cyber laws is to legalize human behaviour and not technology. Cyber laws are technology intensive laws, advocating the use but not the mishandling of technology. Cyber law comprises of all the cases, statutes and legal provisions that affect persons and institutions who control the entry to cyberspace, provide access to cyberspace, create the hardware and software which enable people to access cyberspace or use their own devices to go 'online' and enter cyberspace. Law covers the rules of conduct that have been accepted by the government, and which are in force over a certain region, and which must be followed by all people on that region. Breach of these rules could lead to government action such as captivity or fine or an order to pay compensation. Cyber law encompasses laws relating to Cyber Crimes, Electronic and Digital Signatures, Intellectual Property, and Data Protection and Privacy.

### **Advantages of Cyber Laws**

- The **IT Act 2000** attempts to change outdated laws and provides ways to deal with cyber crimes. We need such laws so that people can perform purchase transactions over the Net through credit cards without fear of misuse. The Act offers the much-needed legal framework so that information is not denied legal effect, validity or enforceability, solely on the ground that it is in the form of electronic records.
- In view of the growth in transactions and communications carried out through electronic records, the Act seeks to empower government departments to accept filing, creating and retention of official documents in the digital

format. The Act has also proposed a legal framework for the authentication and origin of electronic records / communications through digital signature.

- From the perspective of e-commerce in India, the IT Act 2000 and its provisions contain many positive aspects. Firstly, the implications of these provisions for the e-businesses would be that email would now be a valid and legal form of communication in our country that can be duly produced and approved in a court of law.
- Companies shall now be able to carry out electronic commerce using the legal infrastructure provided by the Act.
- Digital signatures have been given legal validity and sanction in the Act.
- The Act throws open the doors for the entry of corporate companies in the business of being Certifying Authorities for issuing Digital Signatures Certificates.
- The Act now allows Government to issue notification on the web thus heralding e-governance.
- The Act enables the companies to file any form, application or any other document with any office, authority, body or agency owned or controlled by the appropriate Government in electronic form by means of such electronic form as may be prescribed by the appropriate Government.
- The IT Act also addresses the important issues of security, which are so critical to the success of electronic transactions. The Act has given a legal definition to the concept of secure digital signatures that would be required to have been passed through a system of a security procedure, as stipulated by the Government at a later date.

Under the IT Act, 2000, it shall now be possible for corporates to have a statutory remedy in case if anyone breaks into their computer systems or network and causes damages or copies data. The remedy provided by the Act is in the form of monetary damages, not exceeding Rs. 1 crore.

### Cyber Addictions

Do you play video games on the Internet in excess? Are you compulsively shopping online? Can't physically stop checking Facebook? Is your excessive computer use interfering with your daily life – relationships, work, school? If you answered yes to any of these questions, you may be suffering from Internet Addiction Disorder, also commonly referred to as Compulsive Internet Use (CIU), Problematic Internet Use (PIU), or iDisorder.

Internet addiction is defined as any online-related, compulsive behavior which interferes with normal living and causes severe stress on family, friends, loved ones, and one's work environment. Internet addiction has been called Internet dependency and Internet compulsivity.

### Information overload

Information overload (also known as infobesity, infoxication, information anxiety, and information explosion) is the difficulty in understanding an issue and effectively making decisions when one has too much information about that issue. Generally, the term is associated with the excessive quantity of daily information. Information overload most likely originated from information theory, which are studies in the

storage, preservation, communication, compression, and extraction of information. The term, information overload, was first used in Bertram Gross' 1964 book.

Information overload occurs when the amount of input to a system exceeds its processing capacity. Decision makers have fairly limited cognitive processing capacity. Consequently, when information overload occurs, it is likely that a reduction in decision quality will occur.

Information overload is a state in which a decision maker faces a set of information (i.e., an information load with informational characteristics such as an amount, a complexity, and a level of redundancy, contradiction and inconsistency) comprising the accumulation of individual informational cues of differing size and complexity that inhibit the decision maker's ability to optimally determine the best possible decision. The probability of achieving the best possible decision is defined as decision-making performance. The suboptimal use of information is caused by the limitation of scarce individual resources. A scarce resource can be limited individual characteristics (such as serial processing ability, limited short-term memory) or limited task-related equipment (e.g., time to make a decision, budget).

## The Causes of Information Overload Today

There are, of course, nearly as many causes of information overload as there are bits of information available to us. However, the most common reasons behind modern information overload include:

- Huge volumes of new information being constantly created

- Pressure to create and compete in information provision – leading to a quantity over quality effect in many industries
- The simplicity of creating, duplicating and sharing of information online
- The exponential increase in channels to receive information by; radio, television, print media, websites, e-mail, mobile telephony, RSS feeds, etc.
- The increasing weight of historical data available to us
- High volumes of conflicting, contradictory and plain old inaccurate information
- No simple methodologies for quickly processing, comparing and evaluating information sources
- A lack of clear structure in groups of information and poor clues as to the relationships between those groups

### **Health issues –guide line for proper usage of computers**

The computer is a vital tool in many different jobs and activities, for adults and children. But long periods of using a computer can increase your chance of developing an injury. Inappropriate computer use can cause muscle and joint pain, overuse injuries of the shoulder, arm, wrist or hand, and eyestrain. Children can experience particular physical and psychological problems if they play computer games too much. You can reduce or avoid these risks with the correct furniture, better posture and good habits, such as taking rest breaks and restricting time spent playing computer games.

#### **Posture-related injuries from computer use**

Back and neck pain, headaches, and shoulder and arm pain are common computer-related injuries. Such muscle and

joint problems can be caused or made worse by poor workstation (desk) design, bad posture and sitting for long periods of time. Although sitting requires less muscular effort than standing, it still causes physical fatigue (tiredness) and you need to hold parts of your body steady for long periods of time. This reduces circulation of blood to your muscles, bones, tendons and ligaments, sometimes leading to stiffness and pain. If a workstation is not set up properly, these steady positions can put even greater stress on your muscles and joints.

### **Preventing computer-related muscle and joint injuries**

Tips to avoid muscle and joint problems include:

- Sit at an adjustable desk specially designed for use with computers.
- Have the computer monitor (screen) either at eye level or slightly lower.
- Have your key board at a height that lets your elbows rest comfortably at your sides. Your forearms should be roughly parallel with the floor and level with the keyboard.
- Adjust your chair so that your feet rest flat on the floor, or use a footstool.
- Use an ergonomic chair, specially designed to help your spine hold its natural curve while sitting
- Use an ergonomic keyboard so that your hands and wrists are in a more natural position.
- Take frequent short breaks and go for a walk, or do stretching exercises at your desk. Stand often.

## Computer-related overuse injuries of the hand or arm

Muscles and tendons can become painful with repetitive movements and awkward postures. This is known as 'overuse injury' and typically occurs in the elbow, wrist or hand of computer users. Symptoms of these overuse injuries include pain, swelling, stiffness of the joints, weakness and numbness.

### Preventing computer-related overuse injuries

Tips to avoid overuse injuries of the hand or arm include:

- Have your mouse at the same height as your correctly positioned keyboard.
- Position the mouse as close as possible to the side of the keyboard.
- Use your whole arm, not just your wrist, when using the mouse. Type lightly and gently.
- Mix your tasks to avoid long, uninterrupted stretches of using the computer.
- Remove your hands from the keyboard when not actively typing, to let your arms relax.

### Eyestrain from computer use

Focusing your eyes at the same distance point for long periods of time causes fatigue. The human eye structurally prefers to look at objects more than six meters away, so any work performed close up puts extra demands on your eye muscles. The illuminated computer screen can also cause eye fatigue. Although there is no evidence that eye fatigue damages your eyesight, computer users may get symptoms such as blurred vision, temporary inability to focus on faraway objects and headaches.

## Preventing eyestrain from computer use

Tips to avoid eyestrain include:

- Make sure your main source of light (such as a window) is not shining into your face or directly onto the computer screen.
- Tilt the screen slightly to avoid reflections or glare.
- Make sure the screen is not too close to your face.
- Put the screen either at eye level or slightly lower.
- Reduce the contrast and brightness of your screen by adjusting the controls.
- Frequently look away from the screen and focus on faraway objects.
- Have regular eye examinations to check that any blurring, headaches and other associated problems are not caused by any underlying disorders.

## Guidelines for Proper usage of Mobile phones

Mobile phones are ubiquitous and research shows that although most users think they have good mobile manners, many people report being irritated or annoyed by the use of the phones in public places.

Clearly there's a lack of understanding of what is and isn't acceptable in terms of mobile etiquette.

### ***Following is a list of dos and don'ts:***

- Do respect those who are with you. When you're engaged face-to-face with others, either in a meeting or a conversation, give them your complete and undivided attention. Avoid texting or taking calls. If a

call is important, apologize and ask permission before accepting it.

- Don't yell. The average person talks three times louder on a mobile phone than they do in a face-to-face conversation. Always be mindful of your volume.

- Do be a good dining companion. No one wants to be a captive audience to a third-party phone conversation, or to sit in silence while their dining companion texts with someone. Always silence and store your phone before being seated. Never put your phone on the table.

- Don't ignore universal quiet zones such as the theatre, church, the library, your daughter's dance recital and funerals.

- Do let voicemail do its job. When you're in the company of others, let voicemail handle non-urgent calls.

- Don't make wait staff wait. Whether it's your turn in line or time to order at the table, always make yourself available to the waiter. Making waiters and other patrons wait for you to finish a personal phone call is never acceptable. If the call is important, step away from the table or get out of line.

- Don't text and drive. There is no message that is so important.

- Do keep arguments under wraps. Nobody can hear the person on the other end. All they are aware of is a one-sided screaming match a few feet away.

- Don't forget to filter your language. A rule of thumb: If you wouldn't walk through a busy public place with a particular word or comment printed on your T-shirt, don't use it in phone conversations.

- Do respect the personal space of others. When you must use your phone in public, try to keep at least three meters between you and others.
- Do exercise good international calling behavior. The rules of phone etiquette vary from country to country.

Good mobile phone etiquette is similar to common courtesy. Conversations and text exchanges have a tendency to distract people from what's happening in front of them. Mobile users should be thoughtful, courteous and respect the people around them.

### **Impact of IT on language and culture**

The advancements in Information Technology affect each and every corners of the society; especially the languages and the culture.

#### **Impact of IT on language**

Through the influence of technology language has developed a lot. There are some who argue that the more recent influence of social media and the internet has led to a "dumbing down" of the language, while others believe that they have helped to spread the language further across the globe. While there will always be contrasting opinion on the negatives and positives regarding the influence of technology, without it, English would not be as widely used and spoken as it is today.

Language is always evolving but technology probably increases the rate of evolution. The ability to communicate and travel (enabled by technology) brings more people into

contact with different languages, and some aspects of technology (mobile phones with texting and emojis) are changing the way people speak and write. Perhaps we will get to the stage where universal translation will work well in the near future.

1. It adds a lot of "jargon" vocabulary - words like "byte" and "internet".
2. It adds meaning to existing words that they didn't have before - like "mouse" and "keyboard" (think "piano").
3. It tends to unify the speech of people around the world because we encounter far more speech from people in remote places. For example, before we had all this technology, in the UK a "billion" was "a million, million" - but now the US meaning ("a thousand million") has more or less taken over because it's just too confusing to continue to use the UK meaning.
4. It spreads linguistic "memes" far faster and much further than ever before. So things like "the cloud" as a metaphor for a distant and nebulous group of computers appeared from nowhere and was in universal use within maybe 6 months.
5. It does also allow numerically small groups of people who spread over larger geographical areas to maintain contact and retain some of their language quirks - this has happened (I believe) with the Welsh language, for example.

### **Impact of technology on society:**

Technology has without doubt an impact on society. As a matter of fact, we experience this effect in our daily lives. It

has an effect on the growth of the economy, our culture and our living standards. It is however important to note that the benefits are a double-edged sword with some being detrimental and other being beneficial. One should be very careful and get to know how the effects on society get to effect the business activities and operations.

### **Positive impact of technology:**

Technology impacts on our daily lives. Our environments are all so full of technology to the point that most of the time we take it for granted and never actually notice the level of impact that it has on us until when we have no telephone, transport, water or electricity. Advancements in technology have greatly increased our living standards. Despite the fact that we are currently experiencing very high inflation rates and the rates of unemployment are very high, generally, people are feeding better, are dressing better and are as a matter of fact living more comfortable lives.

Technology also has a great impact on all the fundamental aspects of all our cultures including laws and how they are enforced, language, art, health care, mobility, education and religion. For instance the great technological improvements in health care have given a chance to doctors to treat their patients in an environment that is virtual through the use of mediums such as video conferencing which has also greatly benefited the legal environment as it allows the judges to still listen to the cases of hard core criminals who cannot be allowed to get into the court rooms due to security reasons.

## Negative impacts of technology:

91

With every advancement that is made in the technological world, creative destruction results. For example, television impacts negatively on the movies and synthetic fibers impact the cotton fibers negatively. The coming in of new types of technology also results in a negative impact on the growth of the economy at times; television at times consumes all the productive hours that a man has in a day. Every new form of technology gets into the market together with long term consequences that are most of the time not foreseeable. For instance is there really a justification for nations coming up with bombs, nuclear weapons and missiles to maintain security?

The first main point for the negative impacts of information technology on society is poor language proficiency. Language proficiency is the ability of an individual to speak or perform in an acquired language. This is a very serious matter to be concerned about this developing information technology on society. This is because the modern technology allows the students to communicate with their families and associates instantly using application such as Line, WeChat and WhatsApp. This application will make life easier to communicate between each other. However, this will cause them to ignore the spelling of different words and the usage of proper grammar.

Besides, technological improvement will cause a huge impact on social life. This is because consumers rely on

communication devices such as smart phone, I-pad, I-pod, Tab for most of their daily tasks. This causes them neglect quality time with their family members as they are busy trying out the new gadgets or new applications available in the market or getting updated to the current trend on the social networks. For example, nowadays teenagers will keep looking and pressing the screen or button on their communication device while they do activities such as eating, watching TV with their family. Sometimes, they pay more attentions to their devices than to their family. The more advanced technology becomes, the more it seems to have control over our lives. Technology has changed human experience nowadays. Nowadays, people spend more time online than ever before and their social life is affected by internet. They like to read the news from the internet instead of newspaper. Also, they also like to chat by using their devices rather than facing each other. This is because they feel that it will save time and money, but this will cause them to be addicted to technology.

Moreover, the advancement of technology not only negatively affected our language proficiency and social life but also our health. Most teenagers and white-collar worker spend numerous hours in front of computer screen without any intense physical activity which may lead to injuries such as lumbar injuries and carpal tunnel syndrome. It is undeniable fact that computer is a vital machine for many different jobs and activities, even in learning, for adults, adolescents and children. However, the long hours of computer can contribute to increasing chance for an injury. "The more tech-time that a child engages in, the less likely it is that will get in his daily dose of physical activity". For example, if

children play too much computer games, they might experience physical and psychological problems. With higher technology, people are prone to be addicted and lazy. This is because people are too dependent on the technology available today. People no longer need to leave their home for entertainment purpose and they can find the answer to anything with the web browser, Google.

In a nutshell, we believe the advancement of technology has negatively impacted our language proficiency, social life and health. Poor language proficiency should be countered by having more communication through internet using proper grammar and correct spellings of different words, having face-to-face communication more frequently or reading more newspaper to improve the language proficiency. We should manage our usage of technology devices by reducing the usage of smartphone for long hours, learn how to communicate and mingle with people around us and make it a habit to write in proper sentences using correct spelling and grammar.

Next regarding social life, we should spend quality time with our family and friends. Moreover, try not to store most of our personal information as it might harm our safety. Lastly, regarding to health, if forced to work for long hours in front of the computer screen, we should take breaks in between to stretch our body and relax our eyes.

Furthermore, society must be able to utilize technology while not allowing it to handicap social interactions, particularly for those who are easily influenced during our formative years. Our world must learn to embrace technology without allowing it to negatively impact the creation of functional adults in society.

## **REVIEW QUESTIONS**

### **Part A**

1. Define the term Information age.
2. What is digital divide?
3. Explain free software movement.
4. What do you mean by Software piracy?
5. What is Cyber Ethics?
6. Define Cyber Crime.
7. What is Cyber threat?
8. What you mean by Cyber Addiction?
9. What is information overload?

### **Part B**

1. What are the advantages of IT in the society?
2. Explain the disadvantages of IT in the society.
3. " Education technology can improve the traditional way of teaching, but cannot replace the human touch"- Comment about it.
4. Explain the activities of Free Software movement.
5. Explain about common types of Cyber threats.
6. Explain the elements of Cyber Security.
7. What are the advantages of Cyber laws.
8. What are the causes of Information Over load.
9. Write some guidelines for the proper usage of Mobile phones.

### **Part C**

1. Explain different Health issues faced by peoples by the over use of Computers and Smart phones.
2. Explain the impact of Technology on Language and culture.