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INFORMATION & COMMUNICATION TECHNOLOGY

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INFORMATION & COMMUNICATION TECHNOLOGY
ESE 2019 Prelims Paper - I

Information
&
Communication Technology

New Pattern
for
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PREFACE

The book 'Information and Communication Technology' has been written with a sole objective to cater to the requirements of engineering students aspiring for Engineering Services Examination (ESE) conducted annually by the Union Public Service Commission (UPSC), and preparing for State Public Service Commission as well as other competitive examinations. This book has been written keeping in mind the needs and interests of students going to write these top engineering competitive examinations, and the standards of the bodies conducting these examinations.

The book covers in detail the complete syllabi for these competitive examinations. For the practice of students, questions on the pattern of these examinations have been included to help the students discover the extent of their knowledge and level of preparation. To make it easier for the students to assimilate the information included in this book, all the important keywords have been printed in bold.

This revised edition includes some detailed and enlarged chapters to elaborate various subjects and topics for the ease of understanding by students. This new and updated edition has been thoroughly scrutinised for errors in each and every chapter, and while going through it students will definitely experience the change.

Amit K. Chaudhary

IES Master Publication
New Delhi, 2018

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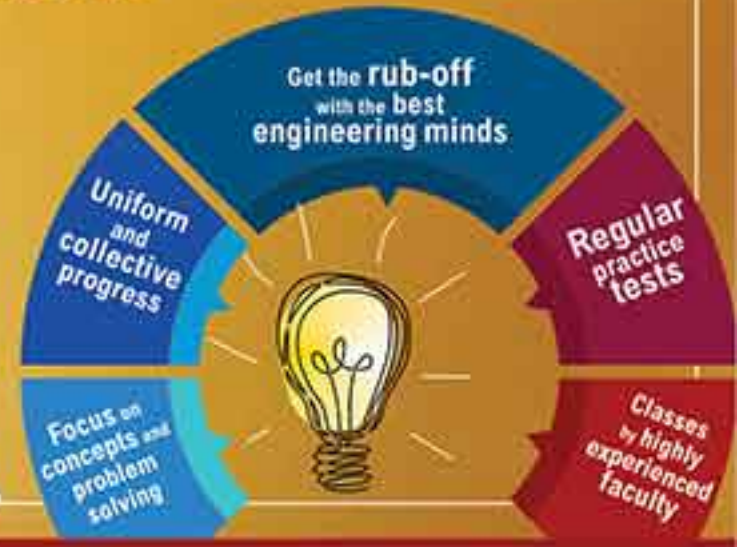

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CHAPTER 1

Information and Communication Technology and its Role

1.1 OVERVIEW OF ICT

INSIDE

- **Overview of ICT**
- **Different Roles of ICT**
- **Applications of ICT**
- **Role of ICT in Various Sectors**
- **Importance of ICT for Civil Society Organizations**
- **Information and Communication Technologies (ICTs) and Child Protection**

ICT stands for **Information and Communication Technology**. ICT is defined as the application of technology in processing of information and communication which includes the use of computers and softwares to not only convert and store but also process, transmit and retrieve information. It covers all the products that stores, manipulates and transmit information electronically in a digital form. For example, personal computers, radio, broadband, television, email, web based content repositories, interactive forums, learning management systems, and management information systems etc. are all classified as ICTs.

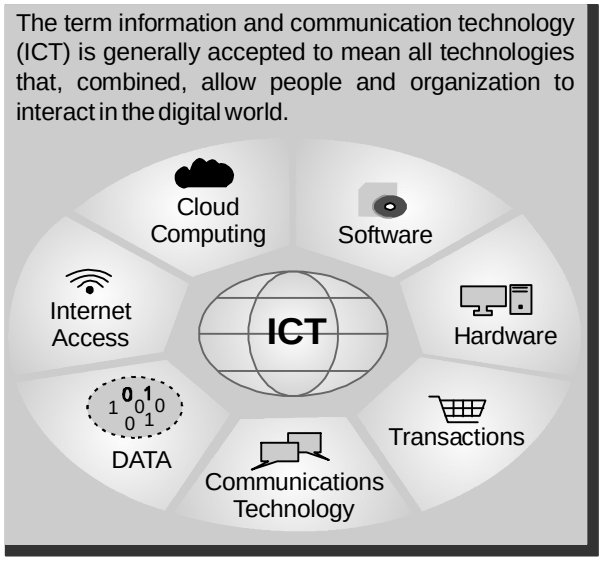

Fig. 1.1: Components of ICT.

National policy on ICT has defined it as **all devices, tools, content, resources, forums, and services, digital and those that can be converted into or delivered through digital forms, which can be deployed for realising the goals of teaching learning, enhancing access to and reach of resources, building of capacities, as well as management of the educational system**. Processes for digitisation, deployment and management of content, development and deployment of platforms and processes for capacity development, and creation of forums for interaction and exchange are parts of ICT.

1.2 DIFFERENT ROLES OF ICT

Information communication and Technology can be used in various roles for different benefits. Following are the roles of ICT.

1. Information Browsing

Browsing is defined as 'an exploratory, information seeking strategy that depends upon serendipity especially appropriate for ill-defined problems and for exploring new task domains'. World Wide Web browsers assist a user to quickly access a wide variety of information sources on the Internet which contains textual as well as audio and video resources.

2. Electronic Publishing and Dissemination

Access to online databases, electronic resources, online information transactions and digitised services can be done with the help of ICT. Electronic publishing provides well-defined access to reliable information to various stakeholders such as academicians, researchers, practitioners and policy makers.

3. Modelling and Simulation

ICTs play a very important role in modelling and simulation, which are crucial in improving systems' capacities in delivering services. For example, Indian Meteorological Department use various ICTs, supercomputers and software to produce models through simulation and are thus able to give weather forecast with accuracy.

4. Online Business and Government Transactions

- They are designed to improve the efficiency and effectiveness of the government's transactions through the use of ICT and eliminate redundant systems and significantly improve the government's quality of services for citizens and businesses.
- They streamline service delivery to citizens, reduce paperwork burdens on businesses and apply the best commercial practices to improve government operating efficiency.
- The following are the applications of ICT in Online Business and Government transactions:
  (a) Land records, birth and death certificates can be procured online.
  (b) A person can pay telephone bills, income tax or property tax over internet and save crucial time in the process.

5. Electronic Conferences

- Meetings and conferences provide arenas for dissemination of information and immediate presentation of new results and cutting edge research. However, it involved high transportation cost which dramatically reduced the potential audience and also time constraints imposed by meetings often conflict with duties.
- However, Electronic conferences can offer exchange of new results and they act as an excellent medium for this exchange. The major advantages of electronic conferences are their low cost and the lack of travel time.

1.3 APPLICATIONS OF ICT

Information and communication technologies can be applied in variety of ways. These application can be cost affective and efficient across different sectors. Following are the application of ICT

1. Data Base

A database is information set with a regular structure. It is usually but not necessarily stored in some machine-readable format accessed by a computer. It includes Relational Data Base Management Systems and Knowledge Base Expert systems.

(a) Relational Data Base Management Systems (RDBMS)

- A relational database management system (RDBMS) is a program that creates, updates, and administers a relational database.
- Databases can be compiled using RDBMS so that it will be possible to subject the database to queries for more informed decision-making. Such systems can also support forecasting and predictive models, especially if time series data sets are available for such areas and communities.
- The database can form a very valuable resource, especially when it is properly archived with the facility for retrieval for specific purposes through well-designed query interfaces.

(b) Knowledge Base Expert Systems

- Knowledge-Based Systems focus on systems that use knowledge-based techniques to support human decision-making, learning and action. The main objective is to make information available to decision makers and technicians, so that they can respond swiftly with efficient solutions to problems.

Questions

1. Consider the following statements.

1. Application of ICT in chemical engineering includes application designing and managing plants, simplifying calculations and drawings that previously had to be done manually.
2. Application of ICT in civil engineering includes the design of mechanized systems such as power and energy systems, aerospace products, weapon systems, transport product engines, and vacuum technology.

Which of the above statement(s) is/are NOT correct?

(a) 2 only (b) 1 only
(c) Both 1 and 2 (d) Neither 1 nor 2

2. Consider the following statements related to the application of Videoconferencing tool in administration.

1. Video teleconferencing can be used to decide urgent matters in consultation with senior officers without calling them over from their offices inorder to make them accessible to the people even while being in a position to confer with other officers in urget matters.
2. It has enabled citizens' participation in decision-making.

Which of the above statement(s) is/are NOT correct?

(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

3. Consider the following statements about the tools of e-commerce

1. Unstructured Supplementary Service Data (USSD) is a tool of e-commerce which allows mobile banking using basic feature mobile phone. Internet data is essential in this service.
2. Micro ATMs is another tool which is used by Bussiness Correspondents to deliver banking services.

Which of the following statement(s) given above is/are correct?

(a) Only 1 (b) Only 2
(c) Both 1 and 2 (d) None of the above

4. Consider the following statements related to the application of ICT in Service delivery by administration.

1. Qualitative and comprehensive information is available on departmental websites, especially in local languages due to ICT.
2. Public grievances matters pertaining to civic amenities are not included udner the online services provided by the administration.
3. ICT enabled single window system provides all government services and information online on web portal

Which of the above statement(s) is/are correct?

(a) 1 and 2 only (b) 2 and 3 only
(c) 1 and 3 only (d) None of the above

5. Which of the following statement(s) is/are the objectives of ICT in engineering?

1. ICT enables provision of flexible access to engineering through establishment of modern educational environments.
2. It fosters international and cross-sectoral knowledge, expertise and best practice exchange.

Select the correct code.

(a) 1 only (b) 2 only
(c) Neither 1 nor 2 (d) Both 1 and 2

6. Consider the following statements.

1. ICT helps administration perform its public functions by simplifying the work processes and internal functioning via internal computerization and automation, thus fostering transparency and accountability.
2. ICT also facilitates policy formulation through multi-stakeholders participation enabling administration to incorporate the ideas and suggestions of professionals, academicians, private sector, civil society organizations, media, and individuals in policy making.

Which of the above statement(s) is/are NOT correct?

(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

21. Consider the following statements.

1. Computerization of all sections of the government departments has made the system efficient in policy making and policy implementation and also aids in the preparation of data repository. But, ICT plays no role in modernizing the criminal tracking system.
2. Networking enables the government departments to smoothly transfer files, papers, records, information and notifications on intranet. It also links state headquarters with district and cities and even the villages forbetter policy making.

Which of the above statement(s) is/are NOT correct?

(a) 1 only (b) 2 only

(c) Both 1 and 2 (d) Neither 1 nor 2

22. Consider the following statements regarding employing ICT tools in engineering projects as by current practice :

1. They must, and do, provide a clearer overview of the project details and interfaces.
2. They must be capable of sharing of information appropriately.
3. They must help to cut down the overall cost of the project with effective monitoring to safeguard against delays.

Which of the above statements are correct?

(a) 1 and 2 only (b) 1 and 3 only

(c) 2 and 3 only (d) 1, 2 and 3

ANSWER KEY

1.	**(a)**	**5.**	**(d)**	**9.**	**(d)**	**13.**	**(c)**	**17.**	**(a)**	**21.**	**(a)**
2.	**(d)**	**6.**	**(d)**	**10.**	**(a)**	**14.**	**(c)**	**18.**	**(c)**	**22.**	**(d)**
3.	**(b)**	**7.**	**(b)**	**11.**	**(a)**	**15.**	**(c)**	**19.**	**(b)**		
4.	**(c)**	**8.**	**(a)**	**12.**	**(b)**	**16.**	**(c)**	**20.**	**(c)**		

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