

Question Bank:

**Sec-A**

**Short Questions: (2 x 5)**

Industrial Revolution & Design principles.	<ol style="list-style-type: none"><li>1. State two significant technological differences between the 3rd and 4th industrial revolutions</li><li>2. In Industry 4.0, how can the <b>blockchain</b> improve transparency in the supply chain?</li><li>3. Revolutions are the adaptation of technologies leading to global impacts. List the technologies specific to Industry 4.0</li></ol>
AI (T Kar)	<ol style="list-style-type: none"><li>1) Compare between different type of artificial intelligence.</li><li>2) List the differences among AI, Machine Learning and Deep Learning.</li><li>3) Differentiate between strong AI and weak AI with examples.</li><li>4) What is the difference between artificial intelligence and machine learning?</li><li>5) What are neural networks used for in AI?</li></ol>
Cyber-Physical System (D Rout)	<ol style="list-style-type: none"><li>1) Differentiate between an embedded system and a cyber-physical system.</li><li>2) State three ways of implementing cyber-physical systems with Industry 4.0.</li><li>3) Identify the CPS reference architecture that supports the whole product lifecycle. Justify.</li><li>4) What are the key challenges in integrating cyber physics with the physical world?</li><li>5) How can cyber physics enhance the field of robotics?</li><li>6) What is the significance of real-time data in cyber physics?</li></ol>
Cloud Computing (A Pati/ A Basak)	<ol style="list-style-type: none"><li>1. What are the deployment models of cloud computing model</li><li>2. What is a hybrid cloud? How can hybrid clouds help enterprises?</li><li>3. Describe the notion of elasticity within cloud computing and highlight how it differs from scalability.</li><li>4. Describe the difference between SaaS, PaaS and IaaS.</li></ol>
Additive Technology (A Pandey)	<ol style="list-style-type: none"><li>1. State that 'how Industry 4.0 gets benefited from additive technology.'</li><li>2. Give any three industrial applications of additive technology.</li><li>3. What is the importance of additive manufacturing in the modern automotive industry?</li></ol>
AR & VR (P Sunil)	<ol style="list-style-type: none"><li>1. What ways can augmented reality improve experiences in the real world?</li><li>2. What is the Process of Virtual Reality?</li></ol>

	3. Distinguish between augmented reality and virtual reality
Big Data (R Lenka)	<p>1. What are the different types of Data?</p> <p>2. Name some of the important tools useful for Big Data analytics.</p> <p>3. What is a block in Hadoop Distributed File System (HDFS)</p> <p>1)Discuss the role of AI in supply chain management and health care sector.</p> <p>2)Discuss in detail about different advantages and disadvantages of AI with example wherever applicable.</p> <p>3)Discuss the areas of application of Artificial Intelligence.</p> <p>4) Define and Explain “learning”. Describe in detail, the range of activities covered by the concept “learning”. Justify the statement that “learning is the most important characteristic of intelligence”.</p> <p>5) What is the impact of AI on human life? Elaborate all positive and negative aspects.</p> <p>6)How AI is transforming Society?</p> <p>7) How AI serves as a cornerstone of Industry 4.0?</p>

Long Questions:  
(Answer any 3 out of the 4) 10 x 3

AI + Bigdata	<p>1. What are the different “V” factors in big data?[10 MARKS]</p> <p>2. What are the key steps in big data solutions considering space management?[10 MARKS]</p> <p>3. How big data analytics can be used in the smart health sector and</p>
-----------------	--

	<p>hospital management system.[10 MARKS]</p> <ol style="list-style-type: none"> <li>What are the significant steps in deploying a big data platform?[5 MARKS]</li> <li>How does cloud computing help in storing and processing big data? Explain.</li> <li>Hadoop is a distributing process for handling large volumes of data. What are the various core components of Hadoop?</li> </ol> <p>AI</p>
Cyber-Physical System + Cloud Computing	<ol style="list-style-type: none"> <li>A washing machine manufacturer wants to implement Industry 4.0 to improve the consumer experience. The company intends to transform its conventional washing machines into intelligent ones by connecting to its private cloud and offering users advanced Android app-based connectivity and controls. The company wants you to suggest an implementation model. Suggest an implementation model for the said application. Justify your choice of implementation.</li> <li>Analyze the suitability of the 5C reference architecture for Industry 4.0. Why is the data-to-information conversion at all necessary?</li> <li>Analyze the significance of machine diagnosis and prognosis in Industry 4.0. How does the CPS reference architecture implement the prognosis and diagnosis functions?</li> <li>What are the characteristics and benefits of cloud computing, and how has it impacted the IT industry?</li> <li>Explain in brief the different deployment models available in Cloud computing. Prepare a comparative analysis of the deployment models based on cost vs. Security and scalability vs. control metrics.</li> </ol>
Additive Technology + AR-VR	<ol style="list-style-type: none"> <li>Differentiate between conventional manufacturing and additive manufacturing. (10-marks)</li> <li>Explain briefly about the role of additive technology in Industry 4.0. (10-marks)</li> <li>List the various processes involved in 3D printing or additive manufacturing with a schematic diagram, and what are its advantages and limitations? (10-marks)</li> <li>What are virtual reality's core elements? Give specifics. (10-marks)</li> <li>What are augmented reality's difficulties? Provide specifics. (10-marks).</li> <li>Write the advantages and disadvantages of AR and VR.</li> </ol>
Evolution & Design principles	<ol style="list-style-type: none"> <li>Industry 4.0 is a technological convergence of innovation in digital-biological and physical trends. Elaborate on this convergence, highlighting at least four innovations from each trend. <b>(10-marks)</b></li> <li>Let one of the textile industries has successfully implemented I4.0 technologies at scale. According to you, what are the five significant principles the sector might have adopted as operational changes? Justify your answer. <b>(10-marks)</b></li> <li>A. The third industrial revolution evolved as automation led by digitization. Explain the scope of improvement in automation through the deployment of cyber-physical systems. (5-marks)</li> </ol>

	<p>B. Describe the three-layered framework of Industry 4.0 relating to the hierarchical flow of data. (5-marks)</p>
--	---

- |  |   |
|--|---|
|  | <p>4. The concept of a digital (virtual) value chain is devised by looking at current internet penetration, computerized designing, and prototyping. Can the digital value chain improve the existing physical value chain? Justify. (10-marks)</p> |
|--|---|