**INTRODUCTION TO INDUSTRY 4.0 AND INDUSTRIAL IOT NPTEL JULY 2021 WEEK 7**

1) Which of the following is/are not considered as LPWAN technology?

solution) **c) Z-wave**

2) Sigfox operates on \_\_\_\_\_\_\_\_\_\_

solution) **a) Unlicensed ISM radio band.**

3) What is the required amount of voltage for interfacing DTH with NodeMCU?

solution) **a) 3.3 V**

4) ZigBee is based on \_\_\_\_\_\_\_\_\_\_\_\_\_ standard.

solution) **c) IEEE802.15.4**

5) Which library is used for interfacing zigbee with python?

solution) **b) xbee**

6) Which of the following software(s) is/are used for configuring Zigbee?

solution) **c) XCTU**

7) According to CISCO, how many connected devices (in billions) will be integrated into global communication by 2020?

solution) **a) 50**

8) In a generic end-to-end architecture of  IIoT processing, how many steps are involved?

solution) **c) 6**

9)  MIDAS is a platform for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

solution) **b) IoT / M2M**

10) How many components are there in FarmBeats?

solution) **d) 7**

11) Which of the following is/are required in a generic  AR drones-based PA?

solution) **d) all of the above**

12)  A contemporary smart warehousing follows a \_\_\_\_\_\_\_\_-based framework.

solutions) **b) REST**

13) Which of the following belong(s) to the four major components of control systems?

solution) **d) all of the above**

14) How many types of loops are present in generic control system?

solution) **a) 2**

15) Architecture of SCADA involves\_\_\_\_\_\_\_\_\_\_\_\_.

solution) **d) all of the above**

# INTRODUCTION TO INDUSTRY 4.0 AND INDUSTRIAL IOT NPTEL JULY 2021 WEEK 3 QUIZ SOLUTIONS.

1) Which of the statements is true for Cyber physical systems?

solution) **c) both a and b**

2) Which of the following is/are applications of CPS in the transportation industry?

solution) **c) both a and b**

3) How many levels are defined in the  5C architecture for CPS-based manufacturing systems?

solution) **b) 5**

4) Which of the following supervisory controls is/are required to determine the action in CPS-based manufacturing system?

solution) **d) all of the above**

5) Which of the following can be used to overcome the limitations of smart sensors?

solution) **a) next generation intelligent sensors**

6) Which of the following enables collaboration productivity in industry 4.0?

solution) **d) all of the above**

7)  What does PLM stand for?

solution) **b) product life cycle management**

8) What is the full form of KPI?

solution) **b) key performance indicator**

9) Which of the following is not a part of  the ten-step approach in the PLM solution?

solution) **d) reduce manpower**

10) \_\_\_\_\_\_\_\_\_\_\_\_ is enhanced version of reality?

solution)  **b) augmented reality**

11) \_\_\_\_\_\_\_\_\_\_ is a mixture of interactive hardware and software-based artificial environment

solution) **a) virtual reality**

12) A  computer program with AI uses which of the following search methods?

solution) **a) heuristic search**

13) Deep learning is a subset of machine learning which can learn automatically by finding the features of objects on its own.

solution) **a) true**

14) Big data consists of\_\_\_\_\_

solution) **c) both a and b**

15) What is HDFS?

solution) **c) file system**

# INTRODUCTION TO INDUSTRY 4.0 AND INDUSTRIAL IOT NPTEL JULY 2021 WEEK 4 QUIZ SOLUTIONS.

1) The protection of  internet-connected systems from cyber attack is known as\_

solution) **c) Cyber security**

2) Trojan horse is a type of \_\_

solution) **b) malware**

3) What is CIA triad in  the cyber security requirements?

solution) **a) confidentiality  , integrity, availability.**

4) What is the full form of SDCMA?

solution) **c) Software-defined cloud manufacturing architecture.**

5) RFID  sensor is used in  mining industry for \_\_\_

solution) **a) tracking miners.**

6) Who coined the term -Industrial Internet?

solution)**a) General Electric.**

7) What is/are the negative effect(s) of industrial revolution?

solution) **d) all of the above.**

8) How many key elements are there in Industrial Internet?

solution) **a) 3**

9) What is/are the advantages of industrial internet?

solution)**d) all of the above.**

10) "Sensor with small memory  and standardized physical  connection to enable communication

with the processor and data network " is the definition of

solution) **b) smart sensors**

11) " A smart sensor can sense multiple parameters in a single sensor node ". True or False?

solution) **a) True**

12) The method adopted to improve the performance of the sensing system by readjusting and removing the error in the measured response of the sensor compared to the actual response is known as\_\_\_\_\_\_\_

solution) **a) sensor calibration.**

13) What is SCADA?

solution) **b) industrial control system.**

14) What is WSAN?

solution) **a) wireless sensing and actuation network.**

15) What are the challenges for industrial processes in industrial 4.0?

solution) **d) all of the above.**

# INTRODUCTION TO INDUSTRY 4.0 AND INDUSTRIAL IOT NPTEL JULY 2021 WEEK 5 QUIZ SOLUTIONS.

1) According to ICP DAS, which of the following is observed as  an energy related challenge in industry 4.0?

solution) a)pollution monitoring

2) Caterpillar uses \_\_\_\_\_\_\_\_\_\_ for enabling smart view.

solution) b) IOT and AR

3) Which of the following belongs to the technology sector of Komatsu?

solution) d) mining intelligence

4) \_\_\_\_\_\_\_\_\_ is/are the building blocks of  contemporary business models

solution) c) both a and b

5) How many types of pricing  models can be observed in the revenue generation and margins of a contemporary business model?

solution) a) 2

6) Outcome-based business model provides benefits to its customers as\_\_\_\_\_\_.

solution) Pay-per-outcome.

7) What are the main components of IIoT business model?

solution)d) all of the above.

8) which of the following customer categories is /are the target customers of a generic cloud-based business model?

solution) c) both a and b

9) In a service-oriented business model, the distribution of  channels is\_\_\_\_\_\_\_.

solution) a) on demand.

10) Which of the following architectures is considered as a standard architecture for IIoT system?

solution) b) Industrial internet reference architecture.

11) Which of the following is/are present in  the architecture frame of the IIRA framework?

solution) d) all of the above

12) Which of the following layers is/are present in IIRA?

solution) a) edge layer

13) Which of the following is/ are considered as the business viewpoints of the business decision makers?

solution) d) both b and c

14) The usage viewpoint of IIRA includes\_\_\_\_\_\_\_.

solution)a) key capabilities

15) The control domain of functional viewpoint includes\_\_\_\_\_\_\_.

solution) d) all of the above

# INTRODUCTION TO INDUSTRY 4.0 AND INDUSTRIAL IOT NPTEL JULY 2021 WEEK 8 QUIZ SOLUTIONS.

1) Which  of the following is/are the necessary application(s) of IIoT analytics?

solution) **d) all of the above**

2) Which of the following is not a type of IIoT analytics?

solution) **d) none of these**

3) The batch-oriented analytics is useful for \_\_\_\_\_\_\_\_

solution)**a) long-term statistics**

4) Machine learning is \_\_\_\_\_\_\_\_\_\_\_\_

solution) **a) A subset of AI**

5) Which of the following is/are true for the k-means clustering algorithm?

solution) **b) one data point is strictly categorized in only one cluster.**

6) Which of the following is not a component of  a reinforcement learning algorithm?

solution) **c) remote**

7) Deep learning imitates the \_\_\_\_\_\_\_\_\_\_

solution) **a) Human neural system and activity**

8) Which of the  following are referred to as the critical requirements of deep learning in IIoT?

solution) **d) large quantity and high quality of  data**

9) Deep learning empowers TOSHIBA with \_\_\_\_\_\_\_\_\_\_ in its semiconductor factory.

solution) **b) Improved yield and high productivity**

10) Which of the following necessitate(s) the emergence of cloud computing?

solution)  **a) The requirement of scalable an secure services**

11) Which of the following is/are not an example(s) of PaaS in cloud computing?

solution) **c) industrial machinery catalyst**

12) Which of the following  is/are the property(ies) of the private deployment models of cloud computing?

solution) **a) cloud setup for the use of a single organization.**

13) Which of the following is/are the cloud platform provider(s)?

solution) **d) all of the above**

14) Which of the following solutions is/are provided by Meshify?

solution) **b) tracker**

15) Which of the following feature(s) need(s) to be considered while choosing an appropriate cloud vendor?

solution) **d) all of the above**

# INTRODUCTION TO INDUSTRY 4.0 AND INDUSTRIAL IOT NPTEL JULY 2021 WEEK 1 QUIZ SOLUTIONS.

1) What are the forms of energy that are converted by an antenna as a transducer?

solution) **a) electromagnetic energy , electric signal.**

2) Which of the following sensors is/are passive in nature?

solution) **b) temperature sensors**

3) \_\_\_\_\_\_\_\_\_\_ sensors provide a continuous function as output in response to an input analog sensor.

solution) **c) analog sensor**

4) Which of the following standards is/ are used in wireless personal area network ( WPAN ) ?

solution) **a) IEEE 802.15.4**

5) A Zigbee can operate on how many frequencies?

solution) **c) 3**

6) what is the size of a Zigbee data packet?

solution) **c) 128 bytes**

7) Which of the following Zigbee devices do not contribute in routing?

solution) **b) end device**

8) What method is used by 6LowPAN for encapsulating a whole IPv6 packet into IEEE802.15.4  frame?

solution) **a) fragmentation**

9) What is the modulation technique used in wireless HART?

 solution) **b) OQPSK**

10) Which of the following is/are QoS  policy/ policies for IOT networks?

solution) **d) all of the above**

11) What does MQTT stand for?

solution) **a) message queue telemetry transport.**

12) How many types of messages are defined by CoAP?

solution) **c) 4 types**

13) Which of the following supports Publish/ Subscribe messaging framework on top of TCP protocol?

solution) **c) XMPP**

14) How many types of message delivery  guarantee services are provided by AMPQ?

solution) **a)1**

15) DDS RTPS Supports Publish/Subscribe framework and on top of UDP transport layer protocol.

solution) **a) true**

# INTRODUCTION TO INDUSTRY 4.0 AND INDUSTRIAL IOT NPTEL JULY 2021 WEEK 2 QUIZ SOLUTIONS.

1) What was the trigger for Fourth industrial revolution?

solution) **a) digital revolution**

2) What were the major drivers for Fourth industrial revolution?

solution) **a) digitization**

3) What does a tipping point refer to in terms  of  industrial revolution?

solution)**a) radical changes that are required in near future.**

4) Which of the following is an element of globalization?

solution) **d) all of the above ( i.e supply chain management, emerging market and business model)**

5) Advancement in technology facilitates manufacturing with high quality products.

solution) **b) True**

6)Which government agency is responsible for environmental regulations?

solution)  **a) environmental protection agencies**

7) What is the expected duration of a  recession?

solution)  **a) few months to not more than few years**

8) Finishing good inventories through eliminating wastes from processes is the property of which  type of good production system?

solution) **b) Lean production system**

9) How many types of wastes are defined in the Lean production system?

solution)**c) 7**

10) What are the impacts of  Lean production system?

solution) **d) all of the above (i.e lower cost, shortest lead time and provides best quality)**

11) Smart and connected products can be achieved through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

solution) **d) All of the above ( i.e embedded systems , cloud computing and internet of things)**

12) Which of the following is one of the key attributes  of a smart business model?

solution)**a) value proposition**

13) What is meant by agility in smart factory?

solution) **c) both a and b ( i.e. self-configuration and flexibility)**

14) What is the use of smart grid in smart factories?

solution)**a) load balancing**

15) Which technology can be  used to operate instruments remotely in smart factories?

solutions)**a) Augmented reality**