

SS END SEMESTER MAKE-UP EXAMINATION (FEBRUARY 2022)

COURSE CODE : SMART SENSOR
COURSE NAME : ICE 4058
SEMESTER : VII
DATE OF EXAM : 26/02/22
DURATION : 45 + 3 minutes

Instructions for Students:

(1) ANSWER ALL THE QUESTIONS.

(2) EACH QUESTION CARRIES 1 MARK.

(3) YOU ARE INSTRUCTED TO INFORM THE INVIGILATOR AFTER SUBMISSION OF THIS FORM IN THE CHAT SECTION.

* Required

* This form will record your name, please fill your name.

1. STUDENT NAME: *

2. REGISTRATION NUMBER: *

3. **Which of the following is the way in which an internet of things device is associated with data?** (1 Point)

- ☐ Internet
- ☐ Network
- ☐ Automata
- ☐ Cloud

4. **Which mathematical computation is usually preferred choice for normalization process?** (1 Point)

- ☐ Zero variance and Unit mean
- ☐ Zero mean and Unit variance
- ☐ Zero mean and Zero variance
- ☐ Unit variance and Unit mean

5. **Which filtering technique smoothens data point by averaging over all past measurements using a smoothing parameter?** (1 Point)

- ☐ Median
- ☐ Variance
- ☐ Mean
- ☐ Exponentially weighted moving average

6. Which of the following is not an IOT expectation of smart sensor?

(1 Point)

- ☐ Self-diagnostic and self-healing
- ☐ Prediction capability
- ☐ Robust
- ☐ Self-calibrating

7. Which of the following is not major component of smart home automation? (1 Point)

- ☐ Software application
- ☐ Communication protocol
- ☐ Hardware
- ☐ All of the options

8. The _____ sensor is not an integral part of biometric fingerprint sensing (1 Point)

- ☐ Capacitive sensor
- ☐ Ultrasonic sensor
- ☐ Pressure sensor
- ☐ Condenser sensor

9. In biometric sensors, the iris code in iris recognition is made up of _____ digit number: (1 Point)

- ☐ 128
- ☐ 512
- ☐ 640
- ☐ 256

10. Which of the following statement is not TRUE with respect to Internet of Things technology? (1 Point)

- ☐ Internet of things can self validate
- ☐ Internet of things is more Machine to Human relationship
- ☐ Internet of things sensors are small so that they can fit anywhere
- ☐ Internet of things require very low power

11. Which of the following is not an application of software sensor? (1 Point)

- ☐ ABILITY TO PERFORM SELF CALIBRATION
- ☐ BACK UP OF MEASURING DEVICES
- ☐ REDUCING MEASURING HARDWARE REQUIREMENTS
- ☐ FAULT DETECTION AND DIAGNOSIS (FDD)

12. **Which type of fault occurs when all systematic faults are accounted for? (1 Point)**

- ☐ Actuator fault
- ☐ Sensor fault
- ☐ Random fault
- ☐ Systematic fault

13. **_____ topology of wireless sensor network relies heavily on bus cable which may lead to collapse in worse scenario: (1 Point)**

- ☐ Star
- ☐ All of the options
- ☐ Tree
- ☐ Mesh

14. **_____ in wireless sensor network (WSN) focusses on density of nodes in single network: (1 Point)**

- ☐ Network topology
- ☐ Scalability
- ☐ Transmission media
- ☐ Reliability

15. **You are a field engineer and investigating a sensor fault occurred in a cement factory. The fault appears for short bursts of time and then, the sensor value returns to its normal value. Which type of sensor fault is this? (1 Point)**

- ☐ Intermittent
- ☐ Bias
- ☐ Sensor stuck
- ☐ Aging

16. **Choose the events in order of their occurrence in remote keyless entry technology.**

- a) If code matches the stored code, motor drive circuit unlocks the door.**
- b) The transmitter generates a frequency when switch in the key is de-pressed.**
- c) If wrong code entered for 10 times, it will be treated as theft.**
- d) The antenna receives signal and is then sent to the receiver for amplifying the received signal. (1 Point)**

- ☐ b, d, c, a
- ☐ b, d, a, c
- ☐ c, d, a, b

17. **_____ is not an emission for detection by smart remote emission detection system? (1 Point)**

- ☐ Nitrogen oxides
- ☐ Sodium dioxide
- ☐ Hydrocarbons
- ☐ Carbon Monoxide

18. The total length of drive and extension arm in micro-gripper device is

_____ μs (1 Point)

- ☐ 400
- ☐ 500
- ☐ 250
- ☐ 300

19. The atomic scope microscopy deals with studying the samples at

_____ scale. (1 Point)

- ☐ Macro
- ☐ Meso
- ☐ Nano
- ☐ Micro

20. Imagine you are driving a car which has cruise control system available in it. You have set speed of the car at 90 kmph and you sit back and relax as the cruise control takes over. Suppose you are having a continuous up/slope gradient for long hour and the main aim is to bring the actual speed close to the desired speed of 90 kmph immediately. Which control action of the controller is needed here?

(1 Point)

- ☐ Derivate
- ☐ Proportional + Integral
- ☐ Proportional + Derivative

⌋

21. **Which of the following statement/s is/are FALSE with respect to IEEE 1451.4 standard?**

a) TEDS is contained within a node and the node located inside a transducer.

b) The communication with individual nodes connected to the MMI is controlled by URN

c) For Class 2 MMI, zero volts is a logic zero and -5 volts is a logic one. (1 Point)

☐ a) and b)

☐ c) only

—

22. _____ models a smart transducer as a software PC with a plug & play as well as backplane. (1 Point)

☐ IEEE 1451.2

☐ IEEE 1451.1

☐ IEEE 1451.3

☐ IEEE 1451.4

23. _____ type of smart sensing technique is used in building automation to maintain good energy efficiency. (1 Point)

☐ MEMS based sensing

☐ Wireless zone sensing

☐ All of the options

☐ Surface acoustic sensing

24. _____ is the smart sensor linearization technique where large series of tangent lines are taken at different points in a linear or non-linear curve. (1 Point)

- ☐ End-point fit
- ☐ Piece-wise Linearization
- ☐ Look up table
- ☐ Ordinary least squares

25. In a closed loop control system, the smart sensor is usually located in _____ path. (1 Point)

- ☐ Forward
- ☐ Feed Forward
- ☐ Reverse
- ☐ Feed back

26. Which of the following statement/statements are TRUE for Process Control Network?

- a) PCNs find it very hard for network intruders to access and control.
- b) The corporate networks and PCN are protected with the help of strong access controls.
- c) They are not secure since they are not connected to internet.

(1 Point)

- ☐ a) only
- ☐ a) and b)
- ☐ c) only

27. Which of the following technique spreads digitized version of analog signal at lower power level? (1 Point)

- ☐ FDMA
- ☐ CPDD
- ☐ TDMA
- ☐ CDMA

28. In PLC, lamps, motors and solenoid valves are connected to: (1 Point)

- ☐ Digital output
- ☐ Analog input
- ☐ Digital input
- ☐ Analog output

29. Consider the following statements:

- 1) Smart sensors have access to cloud support through machine learning
- 2) Smart sensors have the ability of performing self calibration
- 3) Smart sensors have the ability of fault diagnosis and immediate correction of faults.

Which of the statements are FALSE? (1 Point)

- ☐ 2 only
- ☐ 3 only
- ☐ All are true
- ☐ None

30. **An advanced PID controller has been designed and need to be installed within the DCS system. It would belong in: (1 Point)**

- ☐ Level 3
- ☐ Level 2
- ☐ Level 0
- ☐ Level 1

31. **The feature extraction technique based on principal Component Analysis belongs to the family of _____ techniques. (1 Point)**

- ☐ Supervised learning
- ☐ Semi-supervised learning
- ☐ Unsupervised learning
- ☐ Semi-unsupervised learning

32. **In the MCU, the following is used to obtain information from sensors, actuators and output devices: (1 Point)**

- ☐ Bus
- ☐ Input/Output
- ☐ Interrupts
- ☐ Peripherals

This content is neither created nor endorsed by Microsoft. The data you submit will be sent to the form owner.



Microsoft Forms

