Roll No:-_____

SEM-V Diploma Exam 2022 (Odd)

[Time: 3:00 Hours] (Common Branch) (Theory) [Max. Marks: 70]

Industrial Automation (Basics) (2000505F)

- All questions are compulsory. (सभी प्रश्न अनिवार्य है।)
- Marks are mentioned on the right side of each question. (अंक सभी प्रश्न के दाई ओर अंकित किये है।)

Group (A) (ग्रुप -ए)

Q.1 Choose the most suitable answer the following options. (1*20=20)
(सर्वाधिक उपर्युक्त विकल्प को चुनकर लिखें।) :-

i. In open loop control system
(a) Output is independent of controlled input
(b) Output is dependent of controlled input
(c) Only system parameter is having effect on the controlled output
(d) none of the above

ii. An automatic toaster is _____ loop system
(a) Open (b) close (c) Partially close (d) Any of the above

iii. A close loop system distinguished from open loop system by which of the following
(a) Servo mechanism (b) Feedback (c) Output pattern (d) Input pattern

iv. Functional block diagram (FBD) is an example of
(a) PLC language (c) Block diagram of PLC model
(b) Block diagram of CPU module (d) None of these

v. A control system in which control action is somewhat dependent on output is known as
(a) Close loop (b) Semi close loop (c) open loop (d) None of these

vi. Full form of SCADA is
(a) Supervisory column and data assessment (b) Supervisory control and data acquisition
(b) Supervisory control and document acquisition (d) Supervisory column and document assessment

vii. What is the feature of SCADA
(a) Alarm handling (c) Control features using graphical representation
(b) Security management (d) All

viii. The input to a controller is
(a) Sensed signal (c) Desired variable value
(b) Error signal (d) signal of fixed amplitude not dependent on desired variable value

ix. What are the difference between SCADA and HMI
(a) Both are same (c) SCADA is a part of HMI
(b) HMI can be part of SCADA but SCADA can't be part of HMI (d) HMI is not related to SCADA

x. Each line used in ladder language programming is known as
(a) Ring (b) Wrong (c) Rung (d) None of these

xi. A good control system has all the features except
(a) Good stability (b) Slow response (c) Good accuracy (d) Sufficient power handling capacity

xii. The full form of CNC machine is
(a) computer number count (c) Computer number control
(b) computer network control (d) computer numerical control

xiii. A controller essentially is a
(a) Sensor (b) clipper (c) Comparator (d) Amplifier

xiv. The PID controller is very effective for _____ process
(a) slower (b) faster (c) poor (d) None of the above

xv. Proximity sensors are used to
(a) measure humidity (b) measure temperature (c) Measure distance (d) measure strain

xvi. Which of the following quantity can be directly measured by LVDT?
(a) Displacement (b) Force (c) Pressure (d) Weight

xvii. Example of input field device is
(a) Indicators (b) Valves (c) Pump and fans (d) Relays

xviii. _ is an example for industrial automation?
(a) CCTV (b) Street solar lightening (c) Automated bottle filling stations (d) Smoke detectors

xix. Which module accepts and converts signals from sensors into a logic signal?
(a) Input module (b) Output module (c) Both a and b (d) None of the above

xx. _____ is an example for output modules in the programmable logic controller
(a) Switches (b) Alarms (c) Lamps (d) Both b and c

Group (B) (ग्रुप -बी)

Q.2 Define Automation and state its benefits. 4

OR (अथवा)

Draw and explain the basic elements of automation system. 4

Q.3 Compare fixed and programmable automation on any four points. 4

OR (अथवा)

Compare PLC and personal computer on any four points. 4

Q.4 State the classification of PLC based on its type and size. 4

OR (अथवा)

Explain the principle of sensors. Classify the different types of sensors. 4

Q.5 Write some examples of input field devices and and output devices used in automation system.

OR (अथवा)

What are the criteria for selection of actuators in automated system.

Q.6 Explain the importance of directional control valves in pneumatic and hydraulic system.

OR (अथवा)

Describe the working and Application of PID controller.

Group (C) (ग्रुप - सी)

Q.7 Explain the open loop and close loop control system with block diagram.

OR (अथवा)

Write the different type of control. Explain Feed forward control with example.

Q.8 State the types of programming languages used for PLC and explains anyone.

OR (अथवा)

Draw a need block diagram of PLC and explain the function of CPU and memory.

Q.9 Define Actuators. Mention the different types of actuation system.

OR (अथवा)

Explain the following with neat block diagram (a) Pneumatic actuator (b) Hydraulic actuator

Q.10 Write the basic types of automation system and explain any one of it types.

OR (अथवा)

Explain any three PLC based applications in automation.

Q.11 Explain the construction working and application of stepper motor.

OR (अथवा)

Write the short notes on (a) Proximity Sensor (b) Pressure sensor

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SEM-V Diploma Exam 2022 (Odd)
(Common) (Theory)

[Time: 3 Hours] **Industrial Automation (Basics) (2000505F)** **[Max. Marks: 70]**

- All questions are compulsory.
- Marks are mentioned on the right side of each question.

Group (A)

Q.1 Choose the most suitable answer the following options. **(1*20=20)**

i. Which of the following is considered a high level language?
(a) Assembly language (b) Machine language (c) FORTRAN (d) All of the above

ii. CAD/CAM is the inter-relationship between
(a) engineering and marketing
(b) engineering and manufacturing
(c) marketing and design
(d) manufacturing and marketing

iii. Which item best describes a CAM technology?
(a) geometric modeling (b) documentation (c) drafting (d) numerical control

iv. The heart of automation technology is
(a) robots (b) computers (c) control (d) sensors

v. The steady state error is
(a) zero for all inputs to type 1 systems
(b) decreased by increasing gain
(c) independent of the type of input
(d) a function of the transient response

vi. Pressure sensors:
(a) Use the piezoresistive effect in strain gauge sensors
(b) Use an aneroid chamber with a variable resistance output
(c) Use capacitive variations to sense pressure
(d) All of the above

vii. An aneroid barometer
(a) Is very unreliable
(b) Can measure only atmospheric pressure
(c) Measures pressure by sensing deflection of an evacuated chambers
(d) Can be used to measure gas or liquid flow rates

viii. The name given to the test that determines whether a machine can think is the:
(a) Gaussian test (b) McCarthy test (c) Turing test (d) Boolean test

ix. How is the integral mode implemented using analog methods?
(a) Op amp and resistors
(b) Op amp and a capacitor
(c) Op amp and an RC network to place the error voltage across the capacitor
(d) All of the above

x. Fusing factor of fuse is always
(a) less than 1 (b) more than 1 (c) infinity (d) zero

xi. DC motors can be modeled as:
(a) Armature controlled (b) Field Controlled (c) Both a and b (d) None of the mentioned

xii. DC motors are constructed using:
(a) Permanent Magnet (b) Electromagnet. (c) Magnets are not used (d) Plastics

xiii. What is the actuating quantity for the relays?
(a) Magnitude (b) Frequency (c) Phase angle (d) All of these

xiv. When _____ contacts are actuated, they disrupt the power supply through them.
(a) normally open type (b) normally closed type (c) both a. and b. (d) none of the above

xv. Which of the following is the output of a Thermocouple?
(a) Alternating current (b) Direct current (c) AC voltage (d) DC voltage

xvi. Which of the following is/are components of an electric drive?
(a) Control unit and Power Modulator
(b) Electric Motor and Control System
(c) Input Command
(d) Sensing Device and Electric Motor

xvii. Which of the following motor can be referred as a universal motor?
(a) Permanent magnet motor (b) DC shunt motor (c) DC series motor (d) DC compound motor

xviii. The output generated by the piezoelectric sensor is _____.
(a) Mechanical (b) Electric charge (c) Chemical (d) All the above

xix. What are the Approaches of Automation to improve productivity in manufacturing operations?
(a) The USA principle
(b) The ten strategies for automation and production systems
(c) An automation migration strategy
(d) All of the above

xx. Control loop unit of M.C.U is always
(a) a hardware unit (b) a software unit (c) a control unit (d) none of the mentioned

Group (B)

Q.2 What is industrial automation components? 4

Q.3 What is the objective for industrial automation? 4

Q.4 What are the four levels of industrial automation? 4

Q.5 What are the 3 central types of automation? 4

Q.6 What is level zero in industrial automation? 4

Group (C)

Q.7	What is the highest level of industrial automation?	6
Q.8	What are the application of mathematics in industrial engineering?	6
Q.9	What are two examples of the applications of mathematics in industry?	6
Q.10	How we did Temperature Measurement in industrial automation?	6
Q.11	What are the 4 main motor types?	6

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