

Part -I-CHOOSE THE CORRECT ANSWER

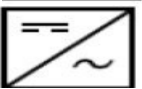
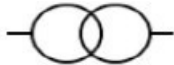
1. If there are 3 identical resistors connected parallel the total resistance will be.
A) 3 times each individual resistor B) 2/3 times each individual resistor
C) 1/3 times each individual resistor D) 4/3 times each individual resistor
2. The responsible person to maintain the quality of work performed by a workteam.
A, supervisor **B, all members of the team** C, worker D, quality assurance officer
3. Resistivity of a conductor is mostly affected by.
A, composition B, pressure **C, Temperature** D, current
4. Written communication methods may include.
A) Discussion B) Negotiation C) Speeches **D) Instructions**
5. What should you do when a problem arises while you are repairing electronic equipment that you cannot solve by yourself?
A, quit repairing B, throw it away **C, ask for assistance** D, murmuring & crying
6. What is the power factor in a capacitive circuit?
A, zero B, unity C, lagging **D, leading**
7. The starting winding of a single phase motor is placed in the----
A, rotor **B, stator** C, armature D, field
8. The frequency of DC supply is.....
A, zero B, 16 Hz C, 50 Hz D, 100 Hz
9. The demand factor for the electrical system is the ratio of
A) **Maximum demand to connected load** B) Maximum demand to average load
C) Average power to maximum power D) Relative power to total power
10. Dielectric materials are
A) **Insulating materials** B) Semiconducting materials
C) Magnetic materials D) Ferroelectric materials
11. Transformer cores are laminated in order to:
A) Simplify its construction B) Minimize eddy current loss
C) Reduce loss **D) Reduce hysteresis loss**
12. Star - delta starter of an induction motor
A) Inserts resistance in rotor circuit B) Inserts resistance in stator circuit
C) Applies reduced voltage to rotor **D) Applies reduced voltage to stator**
13. Brushes of D.C. machines are usually made of
A) Hard copper B) Soft copper **C) Carbon** D) All of above
14. The minimum change in input value that can be detected by measuring called
A) Threshold B) Resolution C) Sensitivity **D) Error**
15. Multiplying resistor is required in
A) Ammeter B) Power **C) Ohmmeter** D) Voltmeter
16. One of the following devices can be used to isolate the control circuit from the load.
A) Toggle switch **B) Relay** C) Circuit breaker D) Rotary switch
17. The aim of preventive maintenance is to
A) Increase the reliability of a tool or equipment. B) Increase the failure rate of tool or equipment.
C) Reduce the life span of a tool or equipment. D) Improve the standard quality of a tool or equipment.
18. A transformer having 1000 primary turns is connected to a 250V AC supply for a secondary voltage 400 V. The number of secondary turns should be
A) 1600 **B) 250** C) 400 D) 125
19. An electronic component which is used as a switching device
A) Capacitor B) Zener diode C) Resistor **D) Transistor**
20. Basic meter movement has an internal resistance of 50 Ω and full scale deflection current 150 mA. What will be the value of the shunt resistor required to measure?
A) 20 Ω B) 35 Ω C) 15 Ω D) 50 Ω
21. The difference between the synchronous speed and the actual speed of an induction motor is known as
A) Regulation B) Backlash **C) Slip** D) Lag

Part II. Matching A and B

Column A

- ___1. DC Motor With constantSpeed **H**
- ___2. Motor with High startingTorque **G**
- ___3. Current limitingDevice **C**
- 4. Used To Store Program & Data in Computer System **J**
- ___5. Proper Attitude towardWork **E**
- 6. Performance of Operation or Quality ofProduct or Service to ensure customer satisfaction ismonitored. **K**
- 7. Constrictive & Encouraging Idea for Improvement **I**
- ___8. VoltageTransformer **R**
- ___9. CurrentTransformer **Q**
- ___10. WashingMachine **M**
- ___11. The Unit ofInductance **A**
- ___12.Rectifier **O**
- ___13.Inverter **P**
- 14. Team Member Understand How TheirTasks Fit In With Other People'stasks. **L**
- 15. Each Members Co-operating with Everyone and assisting others when they needhelp. **F**

Column B

- A. Henry
- B. SpindleMotor
- C. Varistor
- D. Memory
- E. Effective Communication
- F. Initiative
- G. Dc SeriesMotor
- H. ShuntMotor
- I. FeedBake
- J. Hard Disk Driver
- K. Quality Control
- L. Successful Teamwork
- M. 
- N. 
- O. 
- P. 
- Q. 
- R. 

Mechatronics Level-IV COC

Answers key

Part -I-CHOOSE THE CORRECT ANSWER

1. C
2. B
3. C
4. D
5. C
6. B
7. B
8. A
9. A
10. A
11. B
12. D
13. C
14. B
15. D
16. B
17. A
18. A
19. D
20. C
21. C

Part -II-Matching A and B

1. H
2. G
3. C
4. J
5. F
6. K
7. I
8. R
9. Q
10. M
11. A
12. O
13. P
14. E
15. L

Section -A-CHOOSE THE CORRECT ANSWER

1. ____ Find the measurement of voltage with main value greater error and with main value with standard error if series of voltage measurement is as follows

1	2	3	4	5	6	7	8	9	10
3.56	3.50	3.51	3.40	3.41	3.51	3.53	3.45	3.49	3.44

A. 3.49V +/- 0.05V and 3.50V +/- 0.02V B. 3.50V +/- 0.05V and

3.50V +/- 0.01V C. 3.56V +/- 0.05V and 3.50V +/- 0.02V

D. 3.53V +/- 0.05V and 3.54V

+/-0.01V

2. ____ Analogue display in instrumental have the following advantage

A. The display can be set at any value between 0% and 100%
B. Read off errors due to parallax scale
C. No conversion, reading more accurate D. Measured value output directly

3. ____ Determination of electrical resistance from voltage measurement in measuring method

A. Direct B. comparison C. Indirect D. Record

4. ____ Limitation of digital instrumentation

A. Conversion of analogue and digital B. Less affected by noise
C. Greater accuracy and precision D. Easy to store instrumentation

5. ____ Errors that remain constant though all repetition of measurement is said to be

A. Random error B. Cross error C. Systematic error D. Deviation error

6. ____ A process control system is stable

A. If the controlled variable is to oscillate above and below
B. If it can return the controlled variable to steady state
C. If oscillation and steady state value present in the O/P stage
D. If both oscillation and steady state value present in the I/P stage

7. ____ Potentiometers and bridges are classified as ____ instrument

A. Indicating instrument B. Comparison instrument C.

Recording instrument D. Controlling instrument

8. In measuring instrument to measure AC voltage additional thing must be inserted for (DC voltage measurement) What is that

- A. Rectifier and considering RMS value B. Transistor and considering peak to peak voltage
C. An inductor and considering average value D. Capacitor and considering compensating value

9. _____ Which of the following operation of machine categorized in open-loop control system

- A. Packing of beer B. Packing of milk
C. Washing machine D. Pasteurizing of milk

10. The pre-requisite for any measurement is

- A. To know the dimension of measured value
B. Knowledge of which physical quantities can be measured and how they are defined
C. To know which physical quantities to measure
D. To know the reference of measured value

11. It is a science of technology of complete systems designed to measure physical quantities so as to obtain data

- A. Metrology B. Instrumentation C. Mechatronics
D. Comparison instrument

12. _____ In a device that receives energy from one system in one form and re transmits it to another system

- A. Relay B. Ultrasonic sensors C. Limit switch

D. Transducer 13. _____ Active transducer are sometimes is said to be

- A. Self-generating transducer B. Resistance C. Capacitance

D. Inductance 14. _____ If one project work value commissioned,

this indicates

- A. The project are still underway in construction
B. The project are still running with problem
C. The project are invalid all materials are not in operation
D. The project has successfully finished and all material are ready for operation

15. _____ For a quality control of one factory section the basic idea needed could be

- A. There must be enough raw material B. There must be enough main power
C. There must be enough skilled technician D. There must be enough reference point

16. Reputation for consumers electrical installation issued by EEP Co shows the entry for power supply the color white indicate

- A. Phase (R) B. Phase (S) C. Neutral (O)

D. Ground 17. The word calibrate in mechatronics indicate

- A. Supply giving feedback B. Supply giving set point

- C. Supply giving output value D. Supply giving measured value
18. _____ An example of indicating instrument
- A. Kilowatt hour meter B. Potentiometer C. Ammeter
- D. Bridge
19. _____ One of the following measuring instrument determines the time characters of quantities
- A. Digital multimeter B. Ammeter C. Oscilloscope
- D. Wheatstone bridge
20. _____ The best application of capacitive transducer element in any liquid factory
- A. To identify filled or under filled and overfilled containers
- B. To identify number of container
- C. To identify size of container D. To identify presence of container
21. _____ Which one of the following steps take priority in any technical works
- A. Measurement accuracy B. Use safety equipment
- C. Knowing work D. How to read manual

SECTION-B- MATCHING TYPE QUESTIONS INSTRUCTIONS FOR SECTION B

- There are fifteen (15) questions in this section.
- Match column A with column B. Select the letter of the correct answer from column B and write your answer in the answer sheet provided.
- If you wish to change your answer, place an **X** mark through the letter you have written and then write the letter of your preferred answer.
- A correct answer scores 1, an incorrect answer scores 0. Marks will not be deducted for incorrect answers. No marks will be given for a question if more than one answer is supplied.

Column A	Column B
____ 1. Candela ____ 2. Error signal ____ 3. Transducer signal ____ 4. Truly digital and its output ____ 5. Photo voltaic devices ____ 6. Inductive sensor ____ 7. Damper ____ 8. IEC ____ 9. Mechatronics ____ 10. Negative feedback ____ 11. Proximity switch ____ 12. Metric unit ____ 13. Servomotor ____ 14. Passive transducer ____ 15. Closed control	A. Optical transducer B. Stepper motor C. Luminous intensity D. Sense for conductive material E. Algebraic sum of reference signal and feedback signal F. Sensor G. The combination of mechanical, electrical electronics and programming H. Sense limit space I. Oscillation absorber J. System international K. Motor with desired speed control L. Resistance transducer M. With feedback N. British system O. Absolute error P. International electro technical commission Q. Output affect input R. Without feedback S. Kilobyte T. Thermistor

Answers key

Section -A-CHOOSE THE CORRECT ANSWER

1. B
2. A
3. C
4. A
5. C
6. B
7. B
8. A
9. C
10. C
11. B
12. D
13. A
14. D
15. D
16. D
17. B
18. C
19. C
20. A
21. B

SECTION-B- MATCHING TYPE QUESTIONS INSTRUCTIONS FOR SECTION B

1. C
2. E
3. F
4. B
5. A
6. D
7. I
8. P
9. G
10. Q
11. H
12. J
13. K
14. L
15. M

Part -I-CHOOSE THE CORRECT ANSWER

1. A group of physical component combined to perform a specific function.
A) Pressure **B) System** C) Actuator D) Stability
2. Pictorial representation of the cause and effect relationship between the input and output of a physical system. **A, Block diagram** B, Circuit diagram C, Valve D, Filter
3. Supplies air to the pressure vessel through a pipe line and resistance to flow is provided by a constriction. (UC5,9) A, Hydraulic power system B, Electromechanical system **C, Pneumatics system** D, Transfer function
4. Electrical maintenance.
A) Is safe to use in unforeseen circumstances B) Is illuminated and heated to an appropriate level
C) Ensures the efficiency of the installed system D) Provides safe monitoring of industrial processes and systems
5. A group of components which can complete certain tasks or achieve certain desired results in a desired manner while working together is called as ____.
A, Output system B, Sequence system **C, Control system** D, Succession system
6. A "competent" worker is one who:
A, Cannot do the job or task **B, Has been trained to do a job or task successfully**
C, Can do the job or task more quickly than anyone else
D, Is quarrelsome and likely to cause an argument at work
7. An appropriate performance indicator that a small business might use to evaluate its level of social responsibility is.
A. Results of a customer satisfaction survey B. Profit **C. Rate of greenhouse gas emissions generated over a period of time** D, Staff turnover
8. On-off control is also called as
A, One position control **B, Two position control** C, Four position control D, Half position control
9. In which stage the measurement system comes in contact with the measured or the quantity to be measured?
A) **Transducer stage** B) Signal processor stage C) Output stage D) Production stage
10. A cyclical process that involves data gathering, interpretation and identification of the problem areas and possible acting programs.
A) Benchmarking B) Asset C) Profit **D) Diagnosis**
11. The transformation of a set of input, which may be material, actions, methods and operations into desired outputs in the form of a product.
A) Control **B) Process** C) Automation D) Sensor
12. The term given to programs stored in ROMs or in programmable devices which permanently keep their stored information.
A) Hardware B) Software **C) Firmware** D) Universal serial bus
13. Deciding now what we are going to later including when and how we are going to do it.
A) **Planning** B) Activity C) Monitoring D) Evaluation
14. Which one is displacement measurement sensor?
A) **Resistive sensor** B) Light sensor C) Temperature sensor D) Light emitting diode
15. What is the input of the data acquisition system (DAS) to which a transducer is connected called?
A) Control element B) Interface **C) Channel** D) Function
16. The signal produced by changing the air pressure in the signal pipe in proportion to the measured change in a process variable.
A) Digital signals B) Analog signals C) Resistive temperature device **D) Pneumatics signal**
17. Which one is a passive sensor?
A) **Thermocouple** B) Thermister C) Strain gauge D) Silicon
18. The region between the limits within which a quantity is measured, received or transmitted, expressed by stating the lower and upper range values is ____.
A) Instrument range **B) Calibration range** C) Zero error D) Field standard
19. The main objectives of maintenance are
A) To obtain plants and equipments at its minimum operating efficiency **B) To safeguard instruments by minimizing rate of deterioration** C) Help in implementation of wrong procedures for storage and consumption of spares
D) To hinder management in taking decisions on replacements or new investment

20. The main advantages of closed-loop control system
 A) **Reduced sensitivity to disturbance** B)
 Complex and expensive to construct C) The loss of gain
 D) Quite easy to become unstable
 21. Team commitment and cooperation is developed through
 A) Poor communication and effective decision making B) **Fostering mutual concern and camaraderie between team members** C) Fostering bad feeling between team members D) Dissatisfied communication and ineffectual decision making

Part II.

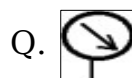
Matching A and B

Column A

- E__1. Controller
 G__2. Disturbance
 I__3. Feed back
 C__4. Goal
 J__5. Tolerance
 B__6. Zero value
 D__7. Harmonizing
 A__8. Open-loop control system
 P__9. Silencer
 N__10. Damper
 H__11. Uncertainty
 F__12. Calibration interval
 L__13. Control valve
 R__14. Water separator automatic drain
 K__15. Closed-loop system

Column B

- A. Central heating boiler controlled only by a timer
 B. The lower end of the range
 C. Declaration of a desired end state
 D. Reconciles disagreements and relieves tensions
 E. Device that measures a variable condition
 F. Period of time of use to ensure the equipment remains reliable
 G. Signal that tends to adversely affect the value of the output of a system
 H. Error in measurement
 I. The output of a system that is returned to modify the input
 J. Permissible deviation from a specified value
 K. Automatic water level controller
 L. Device used to control the flow of fluids such as steam or water
 M. Rectifier
 N. Device used to control the flow of air in a duct or through a wall louver.
 O. Voltage multiplier



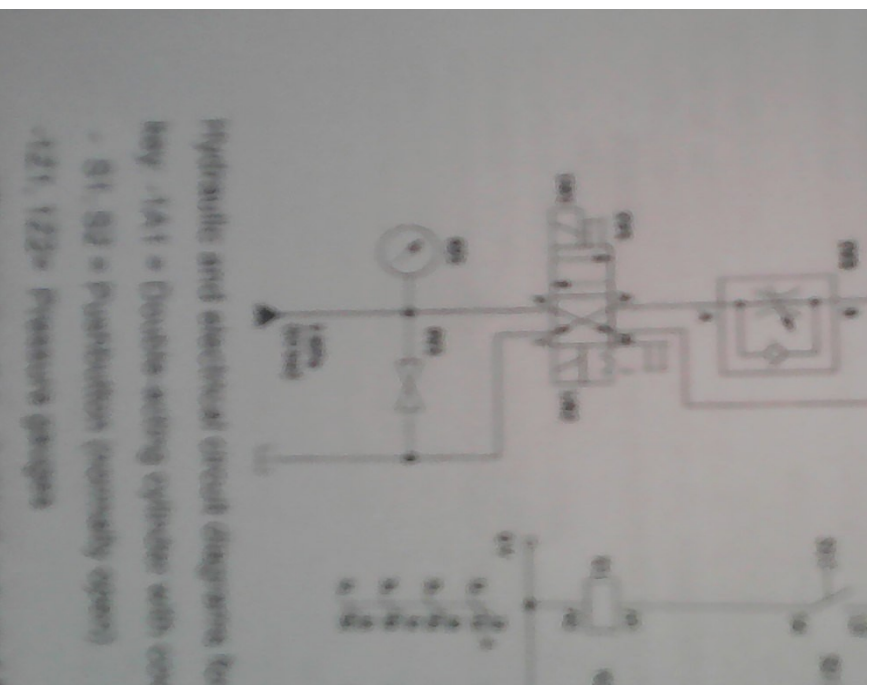
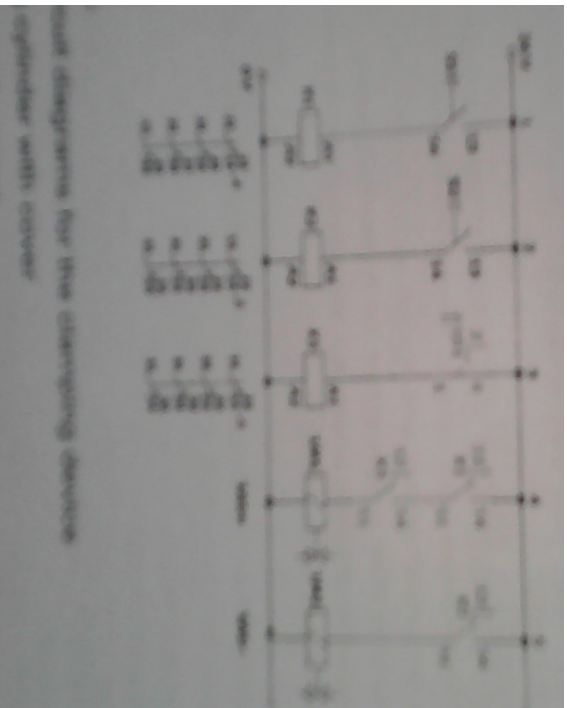
Answers key

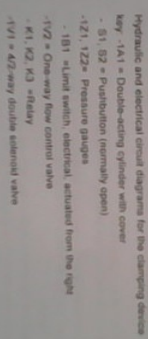
Part -I-
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- 1. B
- 2. A
- 3. C
- 4. C
- 5. C
- 6. B
- 7. C
- 8. B
- 9. A
- 10. D
- 11. B
- 12. C
- 13. A
- 14. A
- 15. C
- 16. D
- 17. A
- 18. B
- 19. B
- 20. A
- 21. B

Part -II-Matching A and B

- 1. E
- 2. G
- 3. I
- 4. C
- 5. J
- 6. B
- 7. D
- 8. A
- 9. P
- 10. N
- 11. H
- 12. F
- 13. L
- 14. R
- 15. K



[illegible]
$$A_2(1) = \text{Chi-sq} \text{ value}$$
