



School of Automotive Skills
Session: 2020-21 (Winter Semester)
B. Voc. Program, Vth Semester,
1st In-Sem. Examination

Course Code: AUT 1501

Time: 1 Hour

Course Name: Automotive Mechatronics System

Max.

Marks: 20

- Instruction:** (a) All questions are compulsory.
(b) Marks for every question are given in Section wise.

Section – A

05X01 = 05 Marks

1. Purge Cannister filter helps in reducing _____ type of emission.
(a) Exhaust. (b) Evaporative.
(c) NVH. (d) Smell in passenger cabin.
2. NOx emissions can be controlled by higher percentage of EGR
(a) True.
(b) False.
3. What is the maximum Air : Fuel ratio that can be achieved in a stratified engine?
(a) 33:1 (b) 22:1.
(c) 46:1 (d) 65:1.
4. Catalytic converter should be placed _____ to the engine
(a) As close as possible (b) As far as possible.
(c) Anywhere in exhaust . (d) None of the above.
5. An IC engine is most inefficient at cold idling
(a) True
(b) False

Section – B

03X02 = 06 Marks

6. Write short note on the two main types of fuel related emissions in an engine.
7. Briefly explain the application of MECHATRONICS in an automobile.
8. Write short note on basic principal of working of ECU .

Section – C

03X03 = 09 Marks

9. What is EGR and how does it help in emission control?
10. Explain the effect of ignition system on emissions.
11. How do electronically controlled valves help in better engine performance?



School of Automotive Skills
Session: 2020-21 (Winter Semester)
B. Voc. Program, 5th Semester,
1st In-Sem. Examination

Course Code: AUT1502

Time: 1 Hour

Course Name: Automotive Electrical System

Max. Marks: 20

Instruction:

1. Answer all questions from section – A, each question carries one mark.
2. Answer all questions from section – B, each question carries two marks.
3. Answer all questions from section – C, each question carries three marks.

Section – A

05X01 = 05 Marks

Q1. Which component of the electrical system keeps the battery charged?

- a) Starter Motor.
- b) Infotainment System.
- c) Alternator.
- d) All of the above.

Q2. What is normally the voltage in the electrical system of a passenger car?

- a) 6V.
- b) 12V.
- c) 24V.
- d) 2V.

Q3. How are all power consumers normally connected in a vehicle?

- a) Series Connection.
- b) Mixed Connection.
- c) Parallel Connection.
- d) None of the above.

Q4. What is the main function of relay?

- a) Sends and receive radio signals.
- b) Switches electrical currents.
- c) Generate high voltage.
- d) Generates electricity.

Q5. What are the causes for a defective supply voltage?

- a) Broken Wire.
- b) Corroded plug.
- c) Defective main fuse.
- d) All of the above.

Section – B

03X02 = 06 Marks

Q6. Why does a voltmeter have a very high internal resistance?

Q7. State Ohm's Law?

Q8. An electric motor has a small internal resistance. How does this affect current consumption and power?

Section – C

03X03 = 09 Marks

Q9. Explain the followings:

1. Voltage.
2. Current.
3. Resistance.

Q10. A manufacturer specifies the maximum resistance for the following leads.

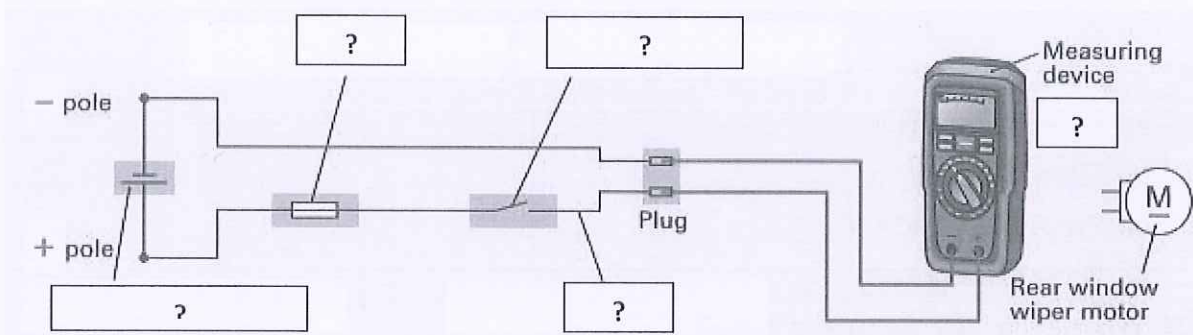
Main starter lead	$I = 450 \text{ A}$	$R_{\text{max}} = 0.001 \text{ Ohm}$
Supply wire for headlights	$I = 10 \text{ A}$	$R_{\text{max}} = 0.03 \text{ Ohm}$
Sensor signal wire	$I = 0.01 \text{ A}$	$R_{\text{max}} = 0.5 \text{ Ohm}$

Calculate the voltage drop for each wire at maximum resistance.

Q11. The voltage of the rear window wiper plug is to be measured.

Name the circuit elements and correctly draw in the measuring wires.

(In circuit diagrams, available switches are typically drawn in their normal position)



Rangis



School of Automotive Skills
Session: 2020-21 (Winter Semester)
B. Voc. Program, 5th Semester,
1st In-Sem. Examination

Course Code: AUT1502

Time: 1 Hour

Course Name: Automotive Electrical and A.C.

Max. Marks: 20

Section – A

05X01 = 05 Marks

Q1. Which component of the electrical system keeps the battery charged?

Answer: c. Alternator.

Q2. What is normally the voltage in the electrical system of a passenger car?

Answer: b. 12V.

Q3. How are all power consumers normally connected in a vehicle?

Answer: c. Parallel Connection.

Q4. What is the main function of relay?

Answer: b. Switches electrical currents.

Q5. What are the causes for a defective supply voltage?

Answer: d. All of the above.

Section – B

03X02 = 06 Marks

Q6. Why does a voltmeter have a very high internal resistance?

Answer:

A Voltmeter has very high resistance to ensure that its connection do not alter flow of current in the circuit. Now if it is connected in series then no current will be there in the circuit due to its high resistance. Hence it is connected in parallel to the load across which potential difference is to be measured.

Q7. State Ohm's Law?

Answer:

Ohm's law states that the current through a conductor between two points is directly proportional to the voltage across the two points. Introducing the constant of proportionality, the resistance.

Q8. An electric motor has a small internal resistance. How does this affect current consumption and power?

Answer:

Power transfer between a voltage source and an external load is at its most efficient when the resistance of the load matches the internal resistance of the voltage source. If the load resistance is too low, then most of the power output of the voltage source is dissipated as heat inside the source itself.

Section – C

03X03 = 09 Marks

Q9. Explain the followings:

1. Voltage.
2. Current.
3. Resistance.

Answer:

1. We define voltage as the amount of potential energy between two points on a circuit. One point has more charge than another. This difference in charge between the two points is called voltage. It is measured in volts, which, technically, is the potential energy difference between two points that will impart one joule of energy per coulomb of charge that passes through it (don't panic if this makes no sense, all will be explained). The unit "volt" is named after the Italian physicist Alessandro Volta who invented what is considered the first chemical battery. Voltage is represented in equations and schematics by the letter "V".
2. We can think of the amount of water flowing through the hose from the tank as current. The higher the pressure, the higher the flow, and vice-versa. With water, we would measure the volume of the water flowing through the hose over a certain period of time. With electricity, we measure the amount of charge flowing through the circuit over a period of time. Current is measured in Amperes (usually just referred to as "Amps"). An ampere is defined as 6.241×10^{18} electrons (1 Coulomb) per second passing through a point in a circuit. Amps are represented in equations by the letter "I".
3. In electrical terms, this is represented by two circuits with equal voltages and different resistances. The circuit with the higher resistance will allow less charge to flow, meaning the circuit with higher resistance has less current flowing through it. This brings us back to Georg Ohm. Ohm defines the unit of resistance of "1 Ohm" as the resistance between two points in a conductor where the application of 1 volt will push 1 ampere, or 6.241×10^{18} electrons. This value is usually represented in schematics with the Greek letter " Ω ", which is called omega, and pronounced "ohm".

Q10. A manufacturer specifies the maximum resistance for the following leads.

Main starter lead	$I = 450 \text{ A}$	$R_{\text{max}} = 0.001 \text{ Ohm}$
Supply wire for headlights	$I = 10 \text{ A}$	$R_{\text{max}} = 0.03 \text{ Ohm}$
Sensor signal wire	$I = 0.01 \text{ A}$	$R_{\text{max}} = 0.5 \text{ Ohm}$

Calculate the voltage drop for each wire at maximum resistance.

Answer:

Given: $R_1 = 0.001 \text{ Ohm}$, $R_2 = 0.03 \text{ Ohm}$, $R_3 = 0.5 \text{ Ohm}$

$I_1 = 450 \text{ A}$, $I_2 = 10 \text{ A}$, $I_3 = 0.01 \text{ A}$.

Solution: $V = I.R$;

$V_1 = 0.45 \text{ V}$;

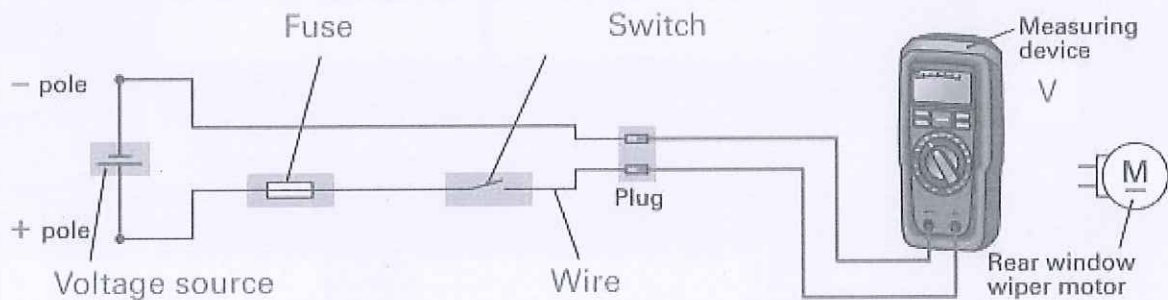
$V_2 = 0.3 \text{ V}$;

$V_3 = 0.005 \text{ V}$.

Q11. The voltage of the rear window wiper plug is to be measured.

Name the circuit elements and correctly draw in the measuring wires.

(In circuit diagrams, available switches are typically drawn in their normal position)



Langji



School of Automotive Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, 5th Semester,
1st In-Sem. Examination

ELP

Course Code: AUT1503

Time: 1 Hours

Course Name: Workshop Management

Max. Marks: 20

Instruction: no

Section – A

5X01 = 05 Marks

Q.1 Which of the following methods of stock control aims at concentrating efforts on selected items of materials:

- a) Perpetual inventory system
- b) Level setting
- c) Material turnover ratio
- d) ABC analysis

Q 2. Fishbone diagram is an example of:

- a) Relevant costing diagram
- b) Cause and effect diagram
- c) Control chart
- d) Pareto diagram

Q 3. What is the purpose of the 5S in the workshop/workplace?

- a) Cleanliness
- b) Efficiency
- c) Organization
- d) All of the above

Q 4. Which of the followings is not the aim of kaizen process:

- a) To make process efficient
- b) To make process controllable
- c) To make process effective
- d) To make process uncontrollable

Q 5. Quality circle is a:

- a) Japanese concept
- b) Historic concept
- c) British concept
- d) Chinese concept

Section – B

02X03 = 6 Marks

Q 1. Define Quality circle.

Q 2. Write down safety equipment used in workshop.

Q.3 Explain Cause and effect diagram on lost control of car with neat sketch.

Section – C

03X03 = 09 Marks

Q 1. Explain ABC analysis with neat sketch.

Q 2. Write down various 5S used in workshop with its meaning

Q 3. Explain Kaizen with neat sketch.



Handwritten blue scribble or mark.



School of Automotive Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, 5th Semester,

A.K.

In-Sem. Examination Answer Key

Course Code: AUT1503

Time: 1 Hours

Course Name: Workshop Management

Max. Marks: 20

Instruction: (if any)

Section – A

Answer key

5X01 = 05 Marks

Q.1 d

Q 2. b

Q 3. d

Q 4. a

Q 5. a

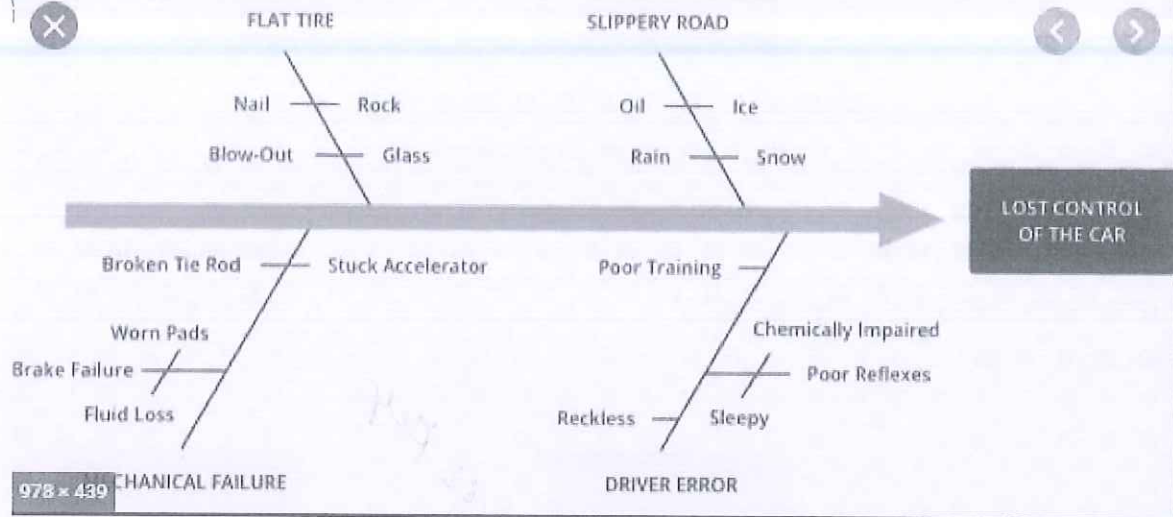
Section – B

02X03 = 6 Marks

Q 1. A quality circle or quality control circle is a group of workers who do the same or similar work, who meet regularly to identify, analyze and solve work-related problems. It consists of minimum three and maximum twelve members in number.

- Q 2. Safety for the head. Wearing a helmet offers protection and can prevent head injuries. ...
- Protect your eyes. ...
- Hearing protection. ...
- Maintain a good respiration. ...
- Protect your hands with the right gloves. ...
- Protection for the feet. ...
- Wear the correct work clothing.

Q. 3.



Section – C

03X03 = 09 Marks

Q 1. In materials management, ABC analysis is an inventory categorization technique. ABC analysis divides an inventory into three categories—"A items" with very tight control and accurate records, "B items" with less tightly controlled and good records, and "C items" with the simplest controls possible and minimal records.

Q 2.



Q 3.



Ans.



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School of Automotive Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, 5th Semester,

1st In-Sem. Examination

OP

Course Code: AUT1504

Time: 1 Hour

Course Name: Paint Shop Management

Max. Marks: 20 marks

Instruction:

1. Answer all questions from section A, each question carries one mark
2. Answer lkk all question from section B, each question carries two mark.
3. Answer all question from section C, each question carries three mark.

Section – A

05X01 = 05 Marks

Q-1. What are the primary colors?

- | | |
|--------------------------|---------------------------|
| a. Red, yellow and blue | c. Blue, violet and green |
| b. Green, orange and red | d. None of the above |

Q-2. Where is the pre-filter situated?

- | | |
|----------------------------------|--------------------------------|
| a. Exhaust blower | c. In the passage of inlet air |
| b. In the passage of exhaust air | d. None of the above |

Q-3. What will happen if we rotate the direction of air cap of a spray gun by 90 degrees?

- | | |
|---|--|
| a. Spray pattern will also rotate by 90 degrees | c. Spray pattern will also rotate by 180 degrees |
| b. Spray pattern will also rotate by 45 degrees | d. None of the above |

Q-4. What is the best way of removing the dust particles after putty dry sanding?

- | | |
|--------------------------|----------------------------|
| a. Air blowing | c. Cleaning with degreaser |
| b. Cleaning with thinner | d. Both (a) and (c) |

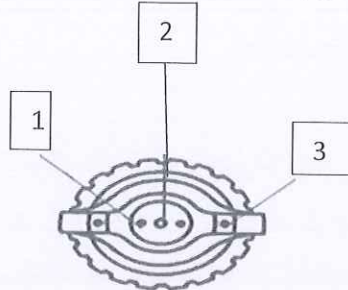
Q-5. Shelf life refers to.....

- | | |
|--|-------------------------|
| a. Drying time of product after mixing | c. Life time of product |
| b. Amount of time a 2-K product can be used after mixing of hardener | d. None of the above |

Section – B

03X02 = 06 Marks

Q-6. Name the different types of holes and also mention their roles in the spray gun functioning.



Q-7 .Write four differences between unique hues and combination hues.

Q-8. What is the role of damper in the paint booth? What will happen if the damper does not function properly?

Section – C

03X03 = 09 Marks

Q-9. Discuss the factors which effect the transfer efficiency of an air spray gun.

Q-10. Write short notes on: -

- a. Hue
- b. Value
- c. Chroma.

Q-11. Draw and explain Hue circle diagram.

A handwritten signature in blue ink, appearing to read 'Pangji'.



School of Automotive Skills
Session: 2020-21 (Summer Semester)
B. Voc. Program, 5th Semester,
1st In-Sem. Examination

Ans.

Course Code: AUT1504

Course Name: Paint Shop Management

Time: 1 Hour

Max. Marks: 20 marks

Answer key

Instruction:

1. Answer all questions from section A, each question carries one mark
2. Answer all question from section B, each question carries two mark.
3. Answer all question from section C, each question carries three mark.

Section – A

05X01 = 05 Marks

Q-1. What are the primary colors?

- | | |
|--------------------------|---------------------------|
| a. Red, yellow and blue | c. Blue, violet and green |
| b. Green, orange and red | d. None of the above |

Ans:- (a)

Q-2. Where is the pre-filter situated?

- | | |
|----------------------------------|--------------------------------|
| a. Exhaust blower | c. In the passage of inlet air |
| b. In the passage of exhaust air | d. None of the above |

Ans:- (c)

Q-3. What will happen if we rotate the direction of air cap of a spray gun by 90 degrees?

- | | |
|---|--|
| a. Spray pattern will also rotate by 90 degrees | c. Spray pattern will also rotate by 180 degrees |
| b. Spray pattern will also rotate by 45 degrees | d. None of the above |

Ans:- (a)

Q-4. What is the particle holding capacity of ceiling filters?

- | | |
|-------------------------|--------------------------|
| e. 10 microns and above | g. 100 microns and above |
| f. 50 microns and above | h. None of the above |

Ans:- (d)

Q-5. Shelf life refers to.....

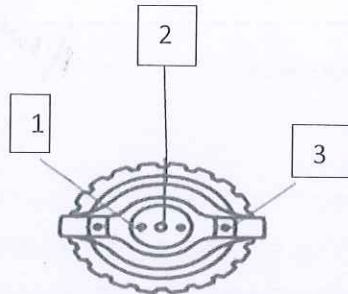
- | | |
|--|-------------------------|
| a. Drying time of product | c. Life time of product |
| b. Amount of time a 2-K product can be used after mixing of hardener | d. None of the above |

Ans:- (c)

Section – B

03X02 = 06 Marks

Q-6. Name the different types of holes.



Ans:-1. Air atomizing holes

2. Centre air hole

3. Fan control air hole

Q-7 .Write four differences between unique hues and combination hues.

Ans:- 1.Some hue perceptions appear to be combined from other hues. For example, we perceive that orange combines hue aspects of red and yellow

2. Other hue perceptions appear to be unique or not combinations. For example, green is a unique hue. It is not perceived as a combination of blue and yellow.

Q-8. What is the role of damper in the paint booth?

Ans:- The role of damper is to circulate the air in the paint booth.

a) during painting mode:-

When we turn on the painting mode, booth the damper stays in its original position which is closed and simply exhaust the air which comes from the inlet air.

b) During baking mode:-

In the baking mode we turn off the exhaust blower and the damper also opens and it helps to recirculate the air to enhance the baking process.

Section – C

03X03 = 09 Marks

Q-9. Discuss the factors which effect the transfer efficiency of air spray gun.

• Ans

- Part size
- Part geometry
- Gun-target distance
- Coating viscosity
- Ease with which coating can be atomized
- Spray gun design and method of atomization
- Fluid pressure
- Atomizing air pressure

- Fan size
- Overlapping of successive spray gun strokes
- Orifice diameter of spray gun cap
- Air velocity in the spray booth
- Air balance in the spray booth

Q-10. Write short notes on Hue, Value and chroma.

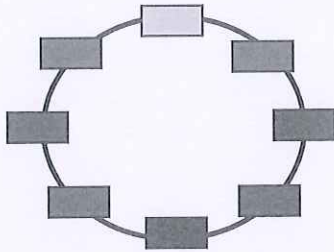
Ans. Hue: - Hue is the most important property of colour as it simply described by simply names of colour. Colour names like red, blue, yellow etc. all are hue names.

Value: - The attribute with which we can classify color on the basis of their lightness and darkness is called value.

Chroma: - The attribute with which we can classify color on the basis of their Brightness and dullness is called chroma.

Q-11. Draw and explain Hue circle diagram.

Ans



White, black and gray are "neutral" colors. They have no hue. Neutral colors are not more related to one hue than to anyother. To show this on the huecircle diagram, we place neutral colors at the center

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