



School of Automotive Skills

Session: 2020-21(Summer)

B. Voc. Program, Vth Semester,

End-Sem. Examination

Set - A

Set - A

Course Code: AUT 1501

Time: 2 Hours

Course Name: MECHATRONICS

Max. Marks: 50

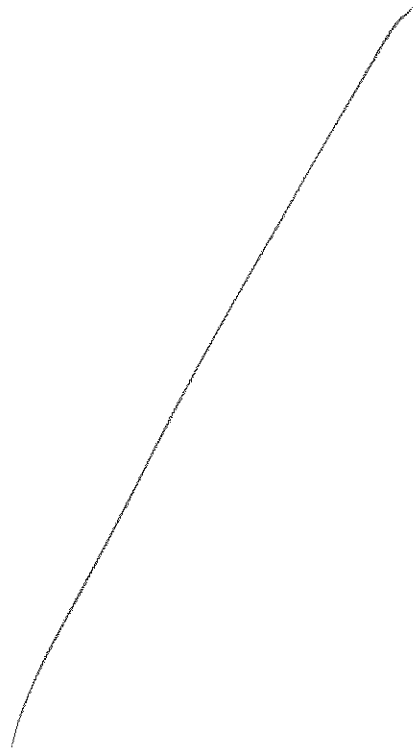
Instruction:

1. Non Programmable Scientific Calculators are permitted.
2. Any assumptions made in attempt of questions may be mentioned.
3. All questions are compulsory.

Section – A

10X01 = 10 Marks

1. High efficiency superchargers help in overcoming the problem of turbo lag
(a) True
(b) False
2. In MPFI system engine cold running phase the ignition timing is corrected with reference to
(a) Coolant temperature (b) RPM
(c) Load (d) All of the above
3. What is the principle of application of canister purge
(a) Exhaust emissions (b) Evaporation emissions
(c) Both (a) & (b) (d) None of the above
4. Valve timing has direct bearing on exhaust emissions by way of
(a) Control of valve timing at different rpm. (b) Valve overlap
(c) None of the above (d) Both (a) & (b).
5. IR Temperature sensor is a _____ type of temperature sensor
(a) Active (b) Contact
(c) Silent (d) Non- contact .
6. When "Active Steering" & " Chassis Systems" are linked to ESP , it is called
(a) Adaptive Cruise Control (b) Dynamic Brake Management
(c) Vehicles Dynamics Management (d) Chauffeur Brakes.





BHARTIYA SKILL DEVELOPMENT UNIVERSITY

7. The TCS gets activated when throttle input and engine torque are mismatched to road surface conditions:

TRUE/FALSE

8. The TCS controls wheel speed by

- (a) Stop spark in one or more cylinders. (b) Reduce fuel supply to a cylinder.
(c) Close the throttle (d) All of the above

9. The main function of transmission system is to....

- (a) Engine always operates in the best conditions (b) Provide reverse movement
(c) Stop the vehicle (d) None of the above.

10. Hill descent control is a.....

- (a) Safety function (b) Comfort function
(c) Navigation function (d) Convenience function

Section – B

04X04 = 16 Marks

11. Write short note on EGR and how it controls emissions.

12. What are the various methods of reducing engine power in TCS?

13. What are the differences between Active and Passive sensors? Explain with examples.

14. What is the logic used by any ECU in controlling actuators ?

Section – C

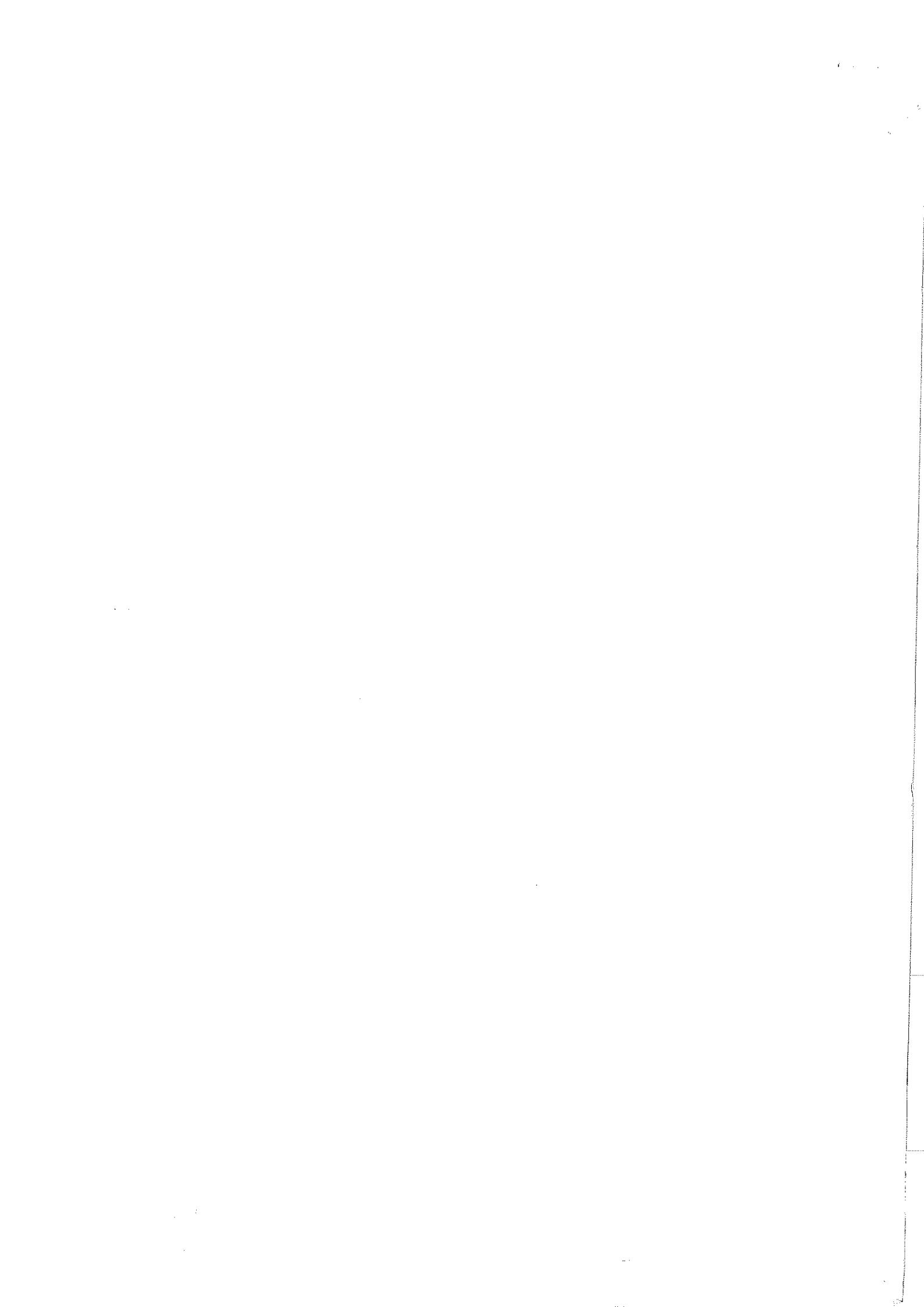
04X06 = 24 Marks

15. Explain the Dynamic Brake Support and Crash Imminent Braking in AEB

16. What are the differences in Semi-automatic transmission and Fully Automatic transmission system?

17. Explain the principle of working of a sensor using Hall Effect.

18. What are the various sequences that a MPFI injector system can have and what are the disadvantages of MPFI System?





School of Automotive Skills
Session: 2020-21 (Summer)
B. Voc. Program, Vth Semester,
End-Sem. Examination

Set - B

Course Code: AUT 1501

Course Name: MECHATRONICS

Time: 2 Hours

Max. Marks: 50

Set - B
Section – A

10X01 = 10 Marks

1. Gasoline Direct Injection engines can work upto A: F ratios of
 - (a) 65:1
 - (b) 22:1
 - (c) 8:1
 - (d) None of the above
2. Pitot tube is a type of flow meter.
 - (a) True
 - (b) False
3. What is the amount of slip permitted for wheels for good traction
 - (a) 0.1 % to 0.3 %.
 - (b) No slip.
 - (c) 3 % to 5 %.
 - (d) None of the above.
4. Ultrasonic sensors are used for
 - (a) Throttle position sensor.
 - (b) Automatic parking
 - (c) Adaptive Cruise Control.
 - (d) All of the above.
5. The brake fluid pressure during TCS operation is provided by
 - (a) Driver paddle.
 - (b) Brake booster.
 - (c) Brake pump.
 - (d) None of the above.

7

1



6. In some vehicles TCS may also increase wheel RPM of driven wheels

- (a) True
- (b) False

7. Inputs of a steering torque sensor is required by

- (d) All of the given

8. What is the principle of application of canister purge

- (a) Evaporation emissions
- (b) Exhaust emission.
- (c) Both (a) & (b)
- (d) None of the above.

9. The Traffic Assist System operates at speeds of less thankmph.

- (a) 40.
- (b) 20.
- © 06
- (d) No limit.

10. ESP does not improve a vehicle's cornering performance

- (a) True
- (b) False

Section – B

04X04 = 16 Marks

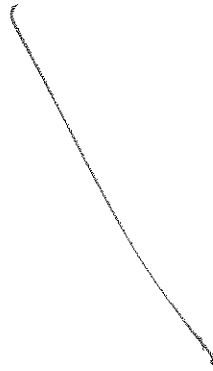
Q 11. Write a short note on TCS in passenger cars.

Q 12. What happens when too much throttle is applied during cornering and how does it effect the rear wheel drive vehicles?

Q 13. Explain the interventions made by a Three Channel – Four Sensor ABS.

Q 14. Explain the four phases of functioning of AEB.







BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Section – C

04X06 = 24 Marks

Q 15. Explain cylinder de-activation in detail and how is it important for emission control?

Q 16. VCR (Variable compression ratio) engines are a futuristic trend. Explain their functioning.

Q 17. Explain various types of temperature sensors in detail

Q 18. How is Cadance Braking different from Threshold Braking ?



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

OPA

Course Code: AUT1502

Set A

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 question from section B, each question carries two mark.
3. Answer all question from section C, each question carries three mark.

Section – A

10X01 = 10 Marks

Q1. The starter motor is driven by...

- | | |
|--------------------|-----------------|
| A. Chain drive | C. Gear drive |
| B. Flat belt drive | D. V-belt drive |

Q2. In automobiles G.V.W. refers to...

- | | |
|------------------------------|------------------------------|
| A. Gross vehicle width. | C. Gross vehicle weight. |
| B. Gross vehicle wheel base. | D. Gross vehicle wheel track |

Q3. What is the voltage rating of an electrical system in a passenger car?

- | | |
|-------------|-------------|
| A. 6 volts | C. 32 Volts |
| B. 12 volts | D. 48 volts |

Q4. Which component of the electrical system keeps the battery charged?

- | | |
|-------------------|----------------|
| A. The engine | C. The brakes |
| B. The alternator | D. The starter |

Q5. A hydrometer is used to determine...

- | | |
|--------------------------------|-------------------------|
| A. Relative humidity | C. Buoyancy force |
| B. Specific gravity of liquids | D. Viscosity of liquids |

Q6. Full form of POF is...

- | | |
|---------------------------|-----------------------|
| A. Plastic optical fiber | C. Pure optical fiber |
| B. Plastic optical freeze | D. None of these |

Q7. Full form of MOST Bus is...

- | | |
|--|-------------------------------------|
| A. Media oriented system transport | C. Model oriented system tools |
| B. Media oriented systematic transformer | D. Multiple oriented system traffic |



Q8. What is the full form of CAN Bus system?

- A. Controller air network
- B. Computer area network
- C. Controller area network
- D. Controlled area network

Q9. Which component of the electrical system keeps the battery charged?

- A. The engine
- B. The alternator
- C. The brakes
- D. The starter

Q10. A hydrometer is used to determine...

- A. Relative humidity
- B. Specific gravity of liquids
- C. Buoyancy force
- D. Viscosity of liquids

Section – B

04X04 = 16 Marks

Q11. What is the difference between active & passive sensor?

Q12 Write down the possible reasons of knocking in an engine.

Q13. Define Flash over in Sparkplug.

Q14. What are the differences between hot spark plug and cold spark plug?

Section – C

04X06 = 24 Marks

Q15. Explain the working of a Hall effect sensor.

Q16. Explain three different types of sensors used in a car.

Q17. What are the advantages of an automotive Networking "Bus System"?

Q18. Explain automotive Ethernet in details. What are the advantages of automotive Ethernet?



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

Answer Key

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 question from section B, each question carries two mark.
3. Answer all question from section C, each question carries three mark.

Section – A

10X01 = 10 Marks

Q1. The starter motor is driven by...

- A. Chain drive
- B. Flat belt drive
- C. Gear drive
- D. V-belt drive

Q2. In automobiles G.V.W. refers to...

- A. Gross vehicle width.
- B. Gross vehicle wheel base.
- C. Gross vehicle weight.
- D. Gross vehicle wheel track

Q3. What is the voltage rating of an electrical system in a passenger car?

- A. 6 volts
- B. 12 volts
- C. 32 Volts
- D. 48 volts

Q4. Which component of the electrical system keeps the battery charged?

- A. The engine
- B. The alternator
- C. The brakes
- D. The starter

Q5. A hydrometer is used to determine...

- A. Relative humidity
- B. Specific gravity of liquids
- C. Buoyancy force
- D. Viscosity of liquids

Q6. Full form of POF is...

- A. Plastic optical fiber
- B. Plastic optical freeze
- C. Pure optical fiber
- D. None of these

Q7. Full form of MOST Bus is...

- A. Media oriented system transport
- B. Media oriented systematic transformer
- C. Model oriented system tools
- D. Multiple oriented system traffic



Q8. What is the full form of CAN Bus system?

C. Controller air network

C. Controller area network

D. Computer area network

D. Controlled area network

Q9. Which component of the electrical system keeps the battery charged?

C. The engine

C. The brakes

D. The alternator

D. The starter

Q10. A hydrometer is used to determine...

C. Relative humidity

C. Buoyancy force

D. Specific gravity of liquids

D. Viscosity of liquids

Section – B

04X04 = 16 Marks

Q11. What is the difference between active & passive sensor?

Ans. Active sensors have its own source of light or illumination. In particular, it actively sends a pulse and measures the backscatter reflected to the sensor. But passive sensors measure reflected sunlight emitted from the sun. When the sun shines, passive sensors measure this energy.

Q12 Write down the possible reasons of knocking in an engine.

- Ans. Ans. Ignition point to early
- Fuel with to low octane number (91 octane)
- Engine overheating
- Compression ratio to high
- Incorrect mixture composition
- Engine overloading

Q13. Define Flash over in Sparkplug.

Ans. Flashover is the phenomenon where sparks are discharged between the terminal and metal shell of the spark plug.

Q14. What are the differences between hot spark plug and cold spark plug?

Ans. When a spark plug is referred to as a "cold plug", it is one that transfers heat rapidly from the firing tip into the engine head, keeping the firing tip cooler. *A "hot plug" has a much slower rate of heat transfer, which keeps the firing tip hotter.



Section – C

04X06 = 24 Marks

Q15. Explain the working of a Hall effect sensor.

Ans. Hall-effect sensors are the linear transducers that are used to measure the magnitude of the magnetic field. Working on the principle of Hall Effect, these sensors generate a Hall voltage when a magnetic field is detected, which is used to measure the magnetic flux density.

Working Principle of Hall Effect Sensor

The principle of Hall voltage is used as a working principle of the Hall Effect sensor. On a thin strip of a conductor, electrons flow in a straight line when electricity is applied. When this charged conductor comes in contact with the magnetic field which is in a perpendicular direction to the motion of electrons, the electrons get deflected. Some electrons get collected on one side while some on another side. Due to this, one of the conductor's plane behaves as negatively charged while the other behaves as positively charged. This creates potential difference and voltage is generated. This voltage is called the Hall voltage. The electrons continue to move from one side of the plane to other till a balance is achieved between the force applied on charged particles due to an electric field and the force that caused magnetic flux that caused this change. When this separation stops, the hall voltage value at that instant gives the measure of magnetic flux density.

Q16. Explain three different types of sensors used in a car.

Ans. Today's modern automobiles have a variety of sensors. You may hear of several of them such as: Throttle position sensor, TPMS sensor, These sensors built into their engine to ensure that the owner can identify and prevent possible issues before they result in breakdowns can result in expensive repairs.

a. The Mass Air Flow Sensor (MAF)

From different types of sensors used in cars, The Mass Air Flow Sensor (MAF) is a computer-controlled sensor that calculates the volume and density of the air taken in by the engine. This in turn ensures the right amount of fuel is used for optimized operating conditions. If this sensor is faulty, the car may stall and the fuel usage will be higher than necessary.

b. The Engine Speed Sensor

The Engine Speed Sensor will help car owners control their cars better. Engine Speed Sensor is attached to the crankshaft and monitors the spinning speed of the crankshaft, which controls the fuel injection and timing of the engine. There are many ways for car engine to stop suddenly, and this sensor will prevent that for drivers.

c. Oxygen Sensor

The Oxygen sensor measures the amount of unburden oxygen that is present in the exhaust pipe and will indicate if the fuel is burning rich or lean. A faulty oxygen sensor will cause the car to idle poorly and jerk as well as cause high fuel consumption.



Q17. What are the advantages of an automotive Networking “Bus System”?

Ans. **Advantages of “Bus-systems”**

- Low cost: Less wires required.
- Centralized: Allows central error diagnosis. (OBDII)
- Robust: Robust towards electric disturbances.
- Efficient: CAN frames are prioritized by ID.
- Flexible: Each CAN-connected ECU can receive all transmitted messages. And it allows easy modification and inclusion of additional nodes.

Q18. Explain automotive Ethernet in details. What are the advantages of automotive Ethernet?



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

OP Set B

Course Code: AUT1502

Set B

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 question from section B, each question carries two mark.
3. Answer all question from section C, each question carries three mark.

Section – A

10X01 = 10 Marks

Q1. Digital Multimeter is used for _____

- A. Measuring a.c. and d.c. current, voltage and resistance
- B. Measuring a.c. current and voltage
- C. Measuring d.c. current and resistance
- D. Measuring a.c. voltage and resistance

Q2. Full form of OBD system is...

- A. On-Board diagnostics
- B. On Back Diagnostics
- C. On Board Data
- D. All of the above

Q3. Tachometer in a vehicle measures...

- A. Speed
- B. Engine rpm.
- C. Distance
- D. Fuel consumption

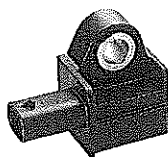
Q4. Which component of the electrical system keeps the battery charged?

- A. The engine
- B. The alternator
- C. The brakes
- D. The starter

Q5. A hydrometer is used to determine...

- A. Relative humidity
- B. Specific gravity of liquids
- C. Buoyancy force
- D. Viscosity of liquids

Q 6. What kind of sensor is shown in the picture below?



- A. Knock sensor.
- B. Acceleration sensor.
- C. Pressure sensor.
- D. Ultrasonic sensor.



Q 7. Which of the following system/device is not mandatory to measure a value?

- A. Sensor.
- B. Wiring.
- C. ECU.
- D. CAN-Bus.

Q 8. What can be a possible cause for a sudden increase in fuel consumption?

- A. False signal from a speed sensor.
- B. False signal from the knock sensor.
- C. False signal from the coolant temperature sensor.
- D. False signal from an oil pressure sensor.

Q 9. CAN communication is typically used to communicate with..

- A. ..the sunroof.
- B. ..the airbag system (SRS).
- C. ..the central locking system.
- D. ..the power windows.

Q 10. Which of the following topologies is used for MOST systems?

- A. Bus.
- B. Star.
- C. Tree.
- D. Ring

Section – B

04X04 = 16 Marks

Q11. What is the CAN BUS?

Q12. Write down the possible reasons of knocking in an engine.

Q13. What is the function of an ECU in a vehicle?

Q14. Explain the working of oxygen sensor & temperature sensor



Section – C

04X06 = 24 Marks

Q15. Explain the working of Hall effect sensor.

Q16. What are the functions of oxygen sensor? Explain in details.

Q17. What are the advantages of Automotive Networking "Bus System"?

Q18. What is automotive Ethernet? What are the advantages of automotive Ethernet?



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

Course Code: AUT1502

Course Name: Automotive Electrical System

Time: 1 Hour

Max. Marks: 20

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

10X01 = 10 Marks

Q1. Digital Multimeter is used for _____

- A. Measuring a.c. and d.c. current, voltage and resistance
- B. Measuring a.c. current and voltage
- C. Measuring d.c. current and resistance
- D. Measuring a.c. voltage and resistance

Q2. Full form of OBD system is...

- A. On-Board diagnostics
- B. On Back Diagnostics
- C. On Board Data
- D. All of the above

Q3. Tachometer in a vehicle measures...

- A. Speed
- B. Engine rpm.
- C. Distance
- D. Fuel consumption

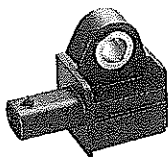
Q4. Which component of the electrical system keeps the battery charged?

- A. The engine
- B. The alternator
- C. The brakes
- D. The starter

Q5. A hydrometer is used to determine...

- A. Relative humidity
- B. Specific gravity of liquids
- C. Buoyancy force
- D. Viscosity of liquids

Q 6. What kind of sensor is shown in the picture below?



- A. Knock sensor.
- B. Acceleration sensor.
- C. Pressure sensor.
- D. Ultrasonic sensor.



Q13. What is the function of an ECU in a vehicle?

Ans. That ECU, or engine control unit, actually controls pretty much everything it takes to keep your engine running, and doing so as cleanly as possible. It is the computer that reads how much vacuum exists in the intake manifold and the position of the throttle plate to control how much gas is injected either into the manifold or the cylinder. It also adjusts the ignition timing for maximum power without a ping. Using information from the oxygen sensors in the exhaust stream, it will fine tune the fuel/air mixture by adjusting how much fuel sprays through the injectors. On newer cars, even the transmission relies on the ECU to tell it when to shift and whether to shift up or down

Q14. Explain the working of oxygen sensor & temperature sensor

Ans. Oxygen Sensor

Automotive oxygen sensors, colloquially known as O₂ sensors, make modern electronic fuel injection and emission control possible. They help determine, in real time, whether the air–fuel ratio of a combustion engine is rich or lean. Since oxygen sensors are located in the exhaust stream, they do not directly measure the air or the fuel entering the engine, but when information from oxygen sensors is coupled with information from other sources, it can be used to indirectly determine the air–fuel ratio. Closed-loop feedback-controlled fuel injection varies the fuel injector output according to real-time sensor data rather than operating with a predetermined (open-loop) fuel map. In addition to enabling electronic fuel injection to work efficiently, this emissions control technique can reduce the amounts of both unburnt fuel and oxides of nitrogen entering the atmosphere. Unburnt fuel is pollution in the form of air-borne hydrocarbons, while oxides of nitrogen (NO_x gases) are a result of combustion chamber temperatures exceeding 1300 kelvins, due to excess air in the fuel mixture therefore contribute to smog and acid rain. Volvo was the first automobile manufacturer to employ this technology in the late 1970s, along with the three-way catalyst used in the catalytic converter.

The sensor does not actually measure oxygen concentration, but rather the difference between the amount of oxygen in the exhaust gas and the amount of oxygen in air. Rich mixture causes an oxygen demand. This demand causes a voltage to build up, due to transportation of oxygen ions through the sensor layer. Lean mixture causes low voltage, since there is an oxygen excess.

Modern spark-ignited combustion engines use oxygen sensors and catalytic converters in order to reduce exhaust emissions



Section – C

04X06 = 24 Marks

Q15. Explain the working of Hall effect sensor.

Ans. Hall-effect sensors are the linear transducers that are used to measure the magnitude of the magnetic field. Working on the principle of Hall Effect, these sensors generate a Hall voltage when a magnetic field is detected, which is used to measure the magnetic flux density.

Working Principle of Hall Effect Sensor

The principle of Hall voltage is used as a working principle of the Hall Effect sensor. On a thin strip of a conductor, electrons flow in a straight line when electricity is applied. When this charged conductor comes in contact with the magnetic field which is in a perpendicular direction to the motion of electrons, the electrons get deflected. Some electrons get collected on one side while some on another side. Due to this, one of the conductor's plane behaves as negatively charged while the other behaves as positively charged. This creates potential difference and voltage is generated. This voltage is called the Hall voltage. The electrons continue to move from one side of the plane to other till a balance is achieved between the force applied on charged particles due to an electric field and the force that caused magnetic flux that caused this change. When this separation stops, the hall voltage value at that instant gives the measure of magnetic flux density.

Q16. What are the functions of oxygen sensor? Explain in details.

Ans. sensors, colloquially known as O₂ sensors, make modern electronic fuel injection and emission control possible. They help determine, in real time, whether the air–fuel ratio of a combustion engine is rich or lean. Since oxygen sensors are located in the exhaust stream, they do not directly measure the air or the fuel entering the engine, but when information from oxygen sensors is coupled with information from other sources, it can be used to indirectly determine the air–fuel ratio. Closed-loop feedback-controlled fuel injection varies the fuel injector output according to real-time sensor data rather than operating with a predetermined (open-loop) fuel map. In addition to enabling electronic fuel injection to work efficiently, this emissions control technique can reduce the amounts of both unburnt fuel and oxides of nitrogen entering the atmosphere. Unburnt fuel is pollution in the form of air-borne hydrocarbons, while oxides of nitrogen (NO_x gases) are a result of combustion chamber temperatures exceeding 1300 kelvins, due to excess air in the fuel mixture therefore contribute to smog and acid rain. Volvo was the first automobile manufacturer to employ this technology in the late 1970s, along with the three-way catalyst used in the catalytic converter.

The sensor does not actually measure oxygen concentration, but rather the difference between the amount of oxygen in the exhaust gas and the amount of oxygen in air. Rich mixture causes an oxygen demand. This demand causes a voltage to build up, due to transportation of oxygen ions through the sensor layer. Lean mixture causes low voltage, since there is an oxygen excess.



Modern spark-ignited combustion engines use oxygen sensors and catalytic converters in order to reduce exhaust emissions

Q17. What are the advantages of Automotive Networking "Bus System"?

Q18. What is automotive Ethernet? What are the advantages of automotive Ethernet?

Ans. In close future, automotive wiring harnesses will change from heterogeneous networks of proprietary protocols (such as CAN and MOST) to hierarchical homogenous automotive Ethernet networks. In the new model, switched 1GE automotive Ethernet will interconnect all the domains in the car (meaning that Ethernet will be a shared medium with signals controlling throttle sharing the same twisted pair as a request to change the radio station and the video for the kids in the back seat).

Advantages:

- Reduce the cable costs
- Reduce the cable weight

Increasing data transfer speed up to 100Mbps

In close future, automotive wiring harnesses will change from heterogeneous networks of proprietary protocols (such as CAN and MOST) to hierarchical homogenous automotive Ethernet networks. In the new model, switched 1GE automotive Ethernet will interconnect all the domains in the car (meaning that Ethernet will be a shared medium with signals controlling throttle sharing the same twisted pair as a request to change the radio station and the video for the kids in the back seat).

Advantages:

- Reduce the cable costs
- Reduce the cable weight

Increasing data transfer speed up to 100Mbps



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

SR+A

Course Code: AUT1503

Set-A

Time: 2 Hour

Course Name: Workshop Management

Max. Marks: 50

Instruction:

1. Answer all questions from section – A, each question carries One mark.
2. Answer all questions from section – B, each question carries Four marks.
3. Answer all questions from section – C, each question carries Six marks.

Section – A¹

10X01 = 10 Marks

Q.1 ABC analysis deals with:

- | | |
|-------------------------------|-------------------------------|
| a. Analysis of process chart. | c. Ordering schedule of job. |
| b. Flow of material. | d. Controlling Inventory cost |

Q.2 What amount of cost will C category items take of inventory budget?

- | | |
|---------|---------|
| a. 10%. | c. 50%. |
| b. 30%. | d. 80%. |

Q.3 What is the full form of EHS?

- | | |
|------------------------------------|---------------------------------------|
| a. Environment, health and safety. | c. Environment, home and surrounding. |
| b. Environment, human and safety. | d. Non of the above. |

Q.4 What is the full form of OHS?

- | | |
|----------------------------------|---------------------------------|
| a. Occupation, health & safety. | c. Operational, health & safety |
| b. Occupational, health & safety | d. Non of the above. |

Q.5 In 5S shine is about?

- | | |
|---|---|
| a. Making sure the paint on all new machines shines like sun. | c. Keeping the plant and tools always clean. |
| b. Making sure there is no dirt on the floor. | d. Workers should keep their shoes always shined. |

Q.6 In a fishbone diagram, some potential causes to consider are:

- | | |
|------------|---------------------|
| a. People | c. Material |
| b. Process | d. All of the above |

Q.7 What amount of cost will B category items take of inventory budget?

- | | |
|---------|---------|
| a. 10%. | b. 30%. |
|---------|---------|



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

c. 50%.

d. 80%.

Q.8 What is the full form of STP?

a. Sewage treatment plant.

c. Save tree policy.

b. Sunlight temperature precaution.

d. Non of the above.

Q.9 Which of the following are characteristics of Break Even Point?

a. There is no loss and no profit to the firm.

c. Total revenue is equal to total cost.

b. Contribution is equal to fixed cost.

d. All of the above.

Q.10 What is the full form of AMC?

a. Annual maintenance cost

c. Automotive maintenance cost

b. Annual monitoring cost

d. Non of the above

Section – B

04X04 = 16 Marks

Q.1 Brief about inventory management policies.

Q.2 Describe employee responsibilities in maintaining the EHS.

Q.3 Write the fundamental objectives of occupational health and safety.

Q.4 Describe the responsibilities of a EHS manager.

Section – C

04X06 = 24 Marks

Q.1 Write steps for fish bone root cause analysis and explain it with example.

Q.2 What is safety? Explain occupational safety, its importance and benefits.

Q.3 What is an ABC curve? Why is its utility in the industry?

Q.4 Write 5 Most common workplace accidents and possible ways to avoid to happen.



School of Automotive Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 5th Semester,

End-Sem. Examination

Course Code: AUT1503

Course Name: Workshop Management

Time: 2 Hour

Max. Marks: 50

SET A

Answer key

Instruction:

1. Answer all questions from section – A, each question carries One mark.
2. Answer all questions from section – B, each question carries Four marks.
3. Answer all questions from section – C, each question carries Six marks.

Section – A

10X01 = 10 Marks

Q.1 ABC analysis deals with:

- a. Analysis of process chart.
- b. Flow of material.
- c. Ordering schedule of job.
- d. **Controlling Inventory cost**

Q.2 What amount of cost will C category items take of inventory budget?

- a. 10%.
- b. 30%.
- c. **50%.**
- d. 80%.

Q.3 What is the full form of EHS?

- a. **Environment, health and safety.**
- b. Environment, human and safety.
- c. Environment, home and surrounding.
- d. Non of the above.

Q.4 What is the full form of OHS?

- a. Occupation, health & safety.
- b. **Occupational, health & safety**
- c. Operational, health & safety
- d. Non of the above.

Q.5 In 5S shine is about?

- a. Making sure the paint on all new machines shines like sun.
- b. Making sure there is no dirt on the floor.
- c. **Keeping the plant and tools always clean.**
- d. Workers should keep their shoes always shined.

Q.6 In a fishbone diagram, some potential causes to consider are:

- a. People
- b. Process
- c. Material
- d. **All of the above**

Q.7 What amount of cost will B category items take of inventory budget?

- a. 10%.
- b. **30%.**
- c. 50%.
- d. 80%.

Q.8 What is the full form of STP?

- a. **Sewage treatment plant.**
- b. Sunlight temperature precaution.
- c. Save tree policy.
- d. Non of the above.



Q.9 Which of the following are characteristics of Break Even Point?

- a. **There is no loss and no profit to the firm.** c. Total revenue is equal to total cost.
b. Contribution is equal to fixed cost. d. All of the above.

Q.10 What is the full form of AMC?

- a. **Annual maintenance cost**
b. Annual monitoring cost
c. Automotive maintenance cost
d. Non of the above

Section – B

04X04 = 16 Marks

Q.1 Brief about inventory management policies.

Ans:

Each item should receive a treatment corresponding to its class:

A-items should have tight inventory control, more secured storage areas and better sales forecasts; reorders should be frequent, with weekly or even daily reorder; avoiding stock-outs on A-items is a priority.

B-items benefit from an intermediate status between A and C; an important aspect of class B is the monitoring of potential evolution toward class A or, in the contrary, toward the class C.

Reordering C-items is made less frequently; a typically inventory policy for C-items consist of having only 1 unit on hand, and of reordering only when an actual purchase is made; this approach leads to stock-out situation after each purchase which can be an acceptable situation, as the C-items present both low demand and higher risk of excessive inventory costs.

Q.2 Describe employee responsibilities in maintaining the EHS.

Ans: **Responsibilities as an Employee**

As an **employee** you have a responsibility to highlight various problems in the working environment. You are the one who knows the most about your everyday work and how your working environment affects you and your work. You therefore have much to contribute to improving the working environment at university/organisation.

- What do you think needs to be improved and developed?

If you have any suggestions for improvements or would like to discuss problem areas, you can always contact your line manager, who is responsible for the working environment in your workplace, or the work environment representative. You can also contact either of the university's working environment coordinators.

Q.3 Write the fundamental objectives of occupational health and safety.

Ans:

According to the document, Global Strategy on Occupational Health for All, the ten high priority objectives proposed by the strategy are as follows:

- Strengthening of international and national policies for health at work and developing the necessary policy tools
- Development of healthy work environment
- Development of healthy work practices and promotion of health at work
- Strengthening of OHS



- Establishing of support services for occupational health
- Development of occupational health standards based on scientific risk assessment
- Development of human resources for occupational health
- Establishment of registration and data systems, development of information services for experts, effective transmission of data and raising public awareness through public information
- Strengthening of research.
- Development of collaboration in occupational health and with other activities and services (World Health Organisation, 1995).

Q.4 Describe the responsibilities of a EHS manager.

Ans: Are as follows although other duties may be assigned from time to time:

- Ensuring that preventative maintenance is completed and current fleet meets quality assurance standards.
- Ensure all workshop is maintained to required standards and meets safety requirements.
- Fully comply with the company Health and Safety requirements including, reporting all accidents, near accidents and hazards.
- Responsible for keeping the workshop clean and free from potential hazards and complaints.
- Testing of work and equipment for safety.

Keeping records of problems found with equipment and the servicing carried out.

Section – C

04X06 = 24 Marks

Q.1 Write steps for fish bone root cause analysis and explain it with example.

Ans:

Steps of root cause analysis (1)

Put effect (= the major contributing factor) in the step 2 as "head of fish"; "Why (the contributing factor) happened?"

Draw heavy line from left to the effect on the center; "Backbone of fish"

Steps of root cause analysis (2)

Determine large category of cause according to your working environment

MSHEL group; Management, Software, Hardware, Environment

4M group; Man, Machine, Material, Method

Example of grouping of causes

Human: knowledge, skills health conditions, physical conditions etc.

Soft: system, methodologies, mechanism etc.

Hard: material, equipment, furniture, tools etc.

Environment: facility environment (water supply, electricity, smell, humidity etc.), working environment (work space, accessibility of materials, arrangement etc.)

Steps of root cause analysis (3)

Seek possible causes for the effect (the primary cause)

Categorize the primary cause into category



Avoid to mention to things in terms of “recourse shortage”

Steps of root cause analysis (4)

Narrow down cause(s) of each primary cause (the secondary cause)

Avoid to mention to things in terms of “resource shortage”

Steps of root cause analysis (5)

Find out “root causes” by asking “Why it is happening?” in enough time (recommended 5 times) for each possible causes listed on primary branch, and branch them into secondary, tertiary.

Q.2 What is safety? Explain occupational safety, its importance and benefits.

Ans: Definition – “The condition of being protected from or unlikely to cause danger, risk, or injury.”
Or

“A device (as on a weapon or a machine) designed to prevent inadvertent or hazardous operation.”

Meaning – Safety is the state of being "safe", the condition of being protected from harm or other non-desirable outcomes. Safety can also refer to the control of recognized hazards in order to achieve an acceptable level of risk.

Safety is the state in which the possibility of harm to persons or of property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and safety risk management.

Occupational safety

Occupational safety, also commonly referred to as industrial safety or workplace safety (WHS), it is a multidisciplinary field concerned with the safety, health, and welfare of people at work.

Benefits of Safety

- Reducing injuries reduce costs to your business.
- Safe workers are loyal workers.
- Workers safety improves quality.

Importance of Safety

A serious workplace injury or death changes lives forever – for families, friends, communities, and co-workers too. Human loss and suffering is immeasurable. Occupational injuries and illnesses can provoke major crises for the families in which they occur.

In addition to major financial burdens, they can impose substantial time demands on uninjured family members. Today, when many families are operating with very little free time, family resources may be stretched to the breaking point.

Every person who leaves for work in the morning should expect to return home at night in good health. “Can you imagine the knock on the door to tell you your loved one will never be returning home?” Or “the phone call to say he’s in the hospital and may never walk again? Ensuring that husbands return to their wives, wives to their husbands, parents to their children, and friends to their friends — that is the most important reason to create a safe work environment.

Q.3 What is an ABC curve? Why is its utility in the industry?

Ans:

ABC analysis is an *inventory categorization method* which consists in dividing items into three categories (A, B, C):



- A being the most valuable items,
- C being the least valuable ones.

This method aims to draw managers' attention on the critical few (A-items) not on the trivial many (C-items).

Q.4 Write 5 Most common workplace accidents and possible ways to avoid to happen.

Ans: A closer look at the five most common workplace accidents and offer safety tips and suggestions to avoid and prevent them from occurring

Slips, Trips And Falls

Slip, trips and falls account for 1/3rd of all personal injuries in the workplace and are a top cause of workers' compensation claims. The types of injuries incurred from slips, trips and falls include head and back injuries, broken bones, cuts and lacerations, sprains and pulled muscles.

The most common reasons for falls in the workplace are:

2. **Slips-** Wet or oily surfaces, occasional spills, weather hazards, loose rugs or mats and flooring that lacks the appropriate degree of traction.
3. **Trips-** Obstructed view, poor lighting, clutter, wrinkled carpeting, uncovered cables, uneven walking surfaces and bottom drawers not being closed.

There are three keys to preventing workplace accidents due to slips, trips and falls: **good housekeeping, quality walking surfaces and proper footwear**. Beyond that, employees should be reminded to take their time and pay attention to where they are going. They should also be encouraged to report areas where clutter, obstruction, spillage or damage have occurred.

Being Caught In or Struck By Moving Machinery

Machinery that's not properly guarded is a potentially a safety hazard. When body parts get caught in or struck by exposed moving parts or flying objects from machines without protective guards, the results are often disastrous. The long and horrifying list of machinery-related injuries includes crushed hands and arms, severed fingers, blindness and worse.

Most mechanical hazards occur in these three places:

4. **The Point of Operation-** Where work is performed on the material: cutting, shaping, boring or forming of stock.
 5. **Power Transmission Apparatus-** Components of the mechanical system transmitting energy to the part of the machine performing the work: flywheels, pulleys, belts, connecting rods, couplings, cams, spindles, chains, cranks and gears.
- **Other Moving Parts-** All parts of the machine that move while the machine is working: reciprocating, rotating and transverse moving parts, feed mechanisms and auxiliary parts of the machine.

The golden rule in preventing mechanical hazards is to remember that any machine part, function or process that may cause injury must be safeguarded. Also, existing hazards must be controlled or eliminated and proper operator training and protective clothing must be provided.

Transportation And Vehicle-Related Accidents

Where there is equipment, vehicles and large trucks, there's the potential for vehicle-related accidents. These accidents include being struck or run over by a moving vehicle, falling from a vehicle, being



struck by objects falling from a vehicle and getting crushed by or stuck under an overturned vehicle. Vehicle-related accidents are the most common cause of fatal injuries in the agriculture industry, but they can be equally catastrophic in industrial or manufacturing environments as well.

There are two distinct kinds of vehicle-related accidents.

6. **On The Road** - Workers can be injured or killed after being struck by a vehicle while repairing roads or other work in traffic zones.
7. **In The Workplace** - Operators of vehicles and equipment can be injured or cause injury to pedestrians.

Avoiding workplace transportation accidents begins with assessing who is at risk, as well as where and when these accidents most commonly occur. Only then are prevention measures, such as vehicle/worker orientation and safe systems of work, more easily established. You should focus on workplace design, ensuring layout routes always segregate pedestrians and vehicles and make any obstructions clearly visible. Directions, **speed limit and priority signs are also helpful.**

- **Fire and Explosions**

Unexpected explosions and fires in the workplace are frequently caused by risk factors such as faulty gas lines, poor pipefitting, improperly stored combustible materials or open flames. The resulting injuries incurred include damage to the respiratory system, varying degrees of burns and potential disfigurement. Explosions and fires account for 3% of workplace injuries and have the highest casualty rate of all probable workplace accidents.

There are four types of injuries commonly associated with fires and explosions:

8. **Primary Blast Injuries** - Occurs due to the effects of pressure on body tissues, affecting ears, lungs and the GI tract.
9. **Secondary Blast Injuries** - Occurs when flying objects strike nearby workers.
10. **Tertiary Blast Injuries** - High-energy explosions can lift someone off the ground and cause them to fly into surrounding objects.
11. **Quaternary Blast Injuries** - Everything else that happens as a result of an explosion: crush injuries, burns and inhalation of toxic substances.

OSHA recommends following its hazard communication standards to help workers avoid fire and explosion injuries. In addition, material safety data sheets (MSDS) for chemicals should be kept on hand and employees should wear personal protective equipment at all times. Every workplace should have a clearly communicated evacuation plan and an effective alert system in place to quickly inform every one of hazards and emergency situations.

- **Overexertion And Repetitive Stress Injuries**

Although more subtle than a catastrophic explosion, musculoskeletal disorders are the most costly workplace injuries. Complaints of back pain alone cost more lost workdays annually. These kinds of injuries contribute to loss of productivity, millions in direct costs and millions in annual health benefit pay out costs.

Overexertion injuries are related to **pulling, lifting, pushing, holding, carrying and throwing.** They account for nearly 33% of occupational injuries. Causes of overexertion include:

12. **Improper Lifting-** Bending at the waist instead of at the knees when carrying or moving heavy objects.



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

13. ***Manually Lifting Heavy Objects*** -Especially objects weighing over 50 pounds, without the assistance of a co-worker or lifting device (manual or mechanical).
14. ***No Breaks*** -With repetitive work, short breaks should be required, or the work may eventually result in too much wear and tear on the body.
15. ***Speeding Up the Line*** -Automation has created work conditions that are faster and often reduced to limited, repetitive tasks.
16. ***Intensive Keying*** -Constant typing and clicking strains muscles and tendons





School of Automotive Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 5th Semester,

End-Sem. Examination

Course Code: AUT1503

Course Name: Workshop Management

Time: 2 Hour

Max. Marks: 50

Instruction:

1. Answer all questions from section – A, each question carries One mark.
2. Answer all questions from section – B, each question carries Four marks.
3. Answer all questions from section – C, each question carries Six marks.

Section – A

10X01 = 10 Marks

Q.1 ABC analysis deals with:

- | | |
|-------------------------------|-------------------------------|
| a. Analysis of process chart. | c. Ordering schedule of job. |
| b. Flow of material. | d. Controlling Inventory cost |

Q.2 What amount of cost will C category items take of inventory budget?

- | | |
|---------|---------|
| a. 10%. | c. 50%. |
| b. 30%. | d. 80%. |

Q.3 What is the full form of EHS?

- | | |
|------------------------------------|---------------------------------------|
| a. Environment, health and safety. | c. Environment, home and surrounding. |
| b. Environment, human and safety. | d. Non of the above. |

Q.4 What is the full form of OHS?

- | | |
|----------------------------------|---------------------------------|
| a. Occupation, health & safety. | c. Operational, health & safety |
| b. Occupational, health & safety | d. Non of the above. |

Q.5 In a fishbone diagram, some potential causes to consider are:

- | | |
|------------|---------------------|
| a. People | c. Material |
| b. Process | d. All of the above |

Q.6 Which of the following is not a forecasting technique?

- | | |
|----------------|-----------------|
| a. Jugdemental | c. Time horizon |
| b. Time series | d. Associative |

Q.7 The forecasting model that is based upon salesperson's estimates of expected sales is

- | | |
|----------------------------|-------------------------------|
| a. Sales force composite. | c. Jury of executive opinion. |
| b. Consumer market survey. | d. Delphi method. |

Q.8 Which of the following are characteristics of Break Even Point?

- | | |
|--|--|
| a. There is no loss and no profit to the firm. | c. Total revenue is equal to total cost. |
| b. Contribution is equal to fixed cost. | d. All of the above. |



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Q.9 In which of the following forecasting technique, data obtained from past experience is analyzed?

- a. Time series forecast
- b. Associative model
- c. Judgemental forecast
- d. All of the above

Q.10 What is the full form of AMC?

- a. Annual maintenance cost
- b. Annual monitoring cost
- c. Automotive maintenance cost
- d. Non of the above

Section – B

04X04 = 16 Marks

Q.1 Briefly write the types of fire?

Q.2 Describe the following

- a. Total cost.
- b. Variable unit cost.
- c. Fixed cost.

Q.3 Write the importance of forecasting.

Q.4 Describe the responsibilities of a EHS manager.

Section – C

04X06 = 24 Marks

Q.1 What is safety? Explain occupational safety, its importance and benefits.

Q.2 What is an ABC curve? What is its utility in the industry?

Q.3 Explain fire management system.

Q.4 What is the requirement of 5S?



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

Set B

Course Code: AUT1503
Course Name: Workshop Management

Time: 2 Hour
Max. Marks: 50

Answer key

Instruction:

1. Answer all questions from section – A, each question carries One mark.
2. Answer all questions from section – B, each question carries Four marks.
3. Answer all questions from section – C, each question carries Six marks.

Section – A

10X01 = 10 Marks

Q.1 ABC analysis deals with:

- | | |
|-------------------------------|--------------------------------------|
| a. Analysis of process chart. | c. Ordering schedule of job. |
| b. Flow of material. | d. Controlling Inventory cost |

Q.2 What amount of cost will C category items take of inventory budget?

- | | |
|---------|----------------|
| a. 10%. | c. 50%. |
| b. 30%. | d. 80%. |

Q.3 What is the full form of EHS?

- | | |
|---|---------------------------------------|
| a. Environment, health and safety. | c. Environment, home and surrounding. |
| b. Environment, human and safety. | d. Non of the above. |

Q.4 What is the full form of OHS?

- | | |
|---|---------------------------------|
| a. Occupation, health & safety. | c. Operational, health & safety |
| b. Occupational, health & safety | d. Non of the above. |

Q.5 In a fishbone diagram, some potential causes to consider are:

- | | |
|------------|----------------------------|
| a. People | c. Material |
| b. Process | d. All of the above |

Q.6 Which of the following is not a forecasting technique?

- | | |
|----------------|------------------------|
| a. Jugdemental | c. Time horizon |
| b. Time series | d. Associative |

Q.7 The forecasting model that is based upon salesperson's estimates of expected sales is

- | | |
|-----------------------------------|-------------------------------|
| a. Sales force composite. | c. Jury of executive opinion. |
| b. Consumer market survey. | d. Delphi method. |

Q.8 Which of the following are characteristics of Break Even Point?

- | | |
|---|--|
| a. There is no loss and no profit to the firm. | c. Total revenue is equal to total cost. |
| b. Contribution is equal to fixed cost. | d. All of the above. |

Q.9 In which of the following forecasting technique, data obtained from past experience is analyzed?

- a. Time series forecast
- b. Associative model
- c. Judgemental forecast
- d. All of the above

Q.10 What is the full form of AMC?

- a. Annual maintenance cost
- b. Annual monitoring cost
- c. Automotive maintenance cost
- d. Non of the above

Section – B

04X04 = 16 Marks

Q.1 Briefly write the types of fire?

Ans:



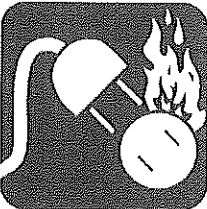
a. Class A

Class A fires are fires in **ordinary combustibles** such as **wood, paper, cloth, rubber, and many plastics.**



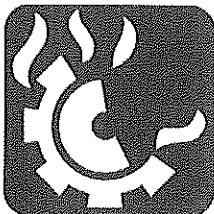
b. Class B

Class B fires are fires in **flammable liquids** such as **gasoline, petroleum greases, tars, oils, oil-based paints, solvents, alcohols.** Class B fires also include **flammable gases** such as **propane and butane.** Class B fires do not include fires involving cooking oils and grease.



c. Class C

Class C fires are fires involving **energized electrical equipment** such as **computers, servers, motors, transformers, and appliances.** Remove the power and the Class C fire becomes one of the other classes of fire.



d. Class D

Class D fires are fires in **combustible metals** such as **magnesium, titanium, zirconium, sodium, lithium, and potassium.**



e. Class K

Class K fires are fires in **cooking oils and greases** such as **animal and vegetable fats.**

Q.2 Describe the following

- a. Total cost.
- b. Variable unit cost.
- c. Fixed cost.



Q.3 Write the importance of forecasting.

Ans: Forecasting is a tool used for predicting future demand based on past demand information. Forecasting plays an important role in various fields of the concern. As in the case of production planning, management has to decide what to produce and with what resources. Thus forecasting is considered as the indispensable component of business, because it helps management to take correct decisions.

Q.4 Describe the responsibilities of a EHS manager.

Ans: Are as follows although other duties may be assigned from time to time:

- Ensuring that preventative maintenance is completed and current fleet meets quality assurance standards.
- Ensure all workshop is maintained to required standards and meets safety requirements.
- Fully comply with the company Health and Safety requirements including, reporting all accidents, near accidents and hazards.
- Responsible for keeping the workshop clean and free from potential hazards and complaints.
- Testing of work and equipment for safety.

Keeping records of problems found with equipment and the servicing carried out.

Section – C

04X06 = 24 Marks

Q.1 What is safety? Explain occupational safety, its importance and benefits.

Ans: Definition – “The condition of being protected from or unlikely to cause danger, risk, or injury.”

Or

“A device (as on a weapon or a machine) designed to prevent inadvertent or hazardous operation.”

Meaning – Safety is the state of being "safe", the condition of being protected from harm or other non-desirable outcomes. Safety can also refer to the control of recognized hazards in order to achieve an acceptable level of risk.

Safety is the state in which the possibility of harm to persons or of property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and safety risk management.

Occupational safety

Occupational safety, also commonly referred to as industrial safety or workplace safety (WHS), it is a multidisciplinary field concerned with the safety, health, and welfare of people at work.

Benefits of Safety

- Reducing injuries reduce costs to your business.
- Safe workers are loyal workers.
- Workers safety improves quality.

Importance of Safety

A serious workplace injury or death changes lives forever – for families, friends, communities, and co-workers too. Human loss and suffering is immeasurable. Occupational injuries and illnesses can provoke major crises for the families in which they occur.



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

In addition to major financial burdens, they can impose substantial time demands on uninjured family members. Today, when many families are operating with very little free time, family resources may be stretched to the breaking point.

Every person who leaves for work in the morning should expect to return home at night in good health. “Can you imagine the knock on the door to tell you your loved one will never be returning home?” Or “the phone call to say he’s in the hospital and may never walk again? Ensuring that husbands return to their wives, wives to their husbands, parents to their children, and friends to their friends — that is the most important reason to create a safe work environment.

Q.2 What is an ABC curve? What is its utility in the industry?

Ans:

ABC analysis is an *inventory categorization method* which consists in dividing items into three categories (A, B, C):

- A being the most valuable items,
- C being the least valuable ones.

This method aims to draw managers’ attention on the critical few (A-items) not on the trivial many (C-items).

Q. 3 Explain fire management system.

Ans: A fire safety strategy for a building is made up of three essential elements:

1) Passive fire safety measures

- Passive Fire safety measures are **features which are built into the structure of the building** and are physical features of the building. These features include the provision of escape routes and exits, the provision of fire resistance to the building structure and the provision of access to and around the building.

2) Active fire safety measures

- Active Fire Precaution measures are systems which activate or are required to be activated in the event of an outbreak of fire. Active Fire Precaution measures would include **fire detection and alarm systems, emergency lighting and fire-fighting equipment**. Fire safety management within a building must include a full appraisal of the active and passive fire safety measures within the building. All deficiencies in the fire safety measures should be noted and a programme of remedial works to upgrade the building to an acceptable standard should be put in place.

3) Management fire safety measures

- Management Fire safety measures relate to the **day to day management of fire safety in a building**. There is a legal responsibility on persons having control over premises to **take reasonable measures to prevent the occurrence of a fire and to protect the lives and safety of occupants in the event of fire**. The active and passive fire safety measures outlined above could be completely negated unless the building occupants are aware of the significance of the measures, of their role with regard to prevention of fire and of the appropriate action to take in the event of fire. A fire safety programme must be established in a building in order to correctly manage fire safety and meet legal obligations. A person should be designated Fire Safety Manager with responsibility for drawing up, implementing and overseeing the fire safety programme. The Fire Safety Manager should be of adequate status within the organisation and should have authority to effectively discharge his/her responsibility. It should be noted at the outset that the elements of the fire safety programme are based on the assumption that active and passive fire safety measures are present within the establishment. In the absence of adequate active and passive fire safety measures within a building more stringent management fire safety measures will be required.

For a building to function safely each of these elements must be adequately provided.



Q.4 What is the requirement of 5S?

Ans.

5S stands for

SEIRI	Organisation/Sort out
SEITON	Orderliness/Systemize
SEISO	The Cleaning/Shining
SEIKETSU	Standardize
SHITSUKE	Sustain/ Discipline

5S began as part of the Toyota Production System (TPS), the manufacturing method begun by leaders at the Toyota Motor Company in the early and mid-20th century. This system, often referred to as Lean manufacturing in the West, aims to increase the value of products or services for customers. This is often accomplished by finding and eliminating waste from production processes.

Lean manufacturing involves the use of many tools such as 5S, kaizen, kanban, jidoka, heijunka, and poka-yoke. 5S is considered a foundational part of the Toyota Production System because until the workplace is in a clean, organized state, achieving consistently good results is difficult. A messy, cluttered space can lead to mistakes, slowdowns in production, and even accidents, all of which interrupt operations and negatively impact a company. By having a systematically organized facility, a company increases the likelihood that production will occur exactly as it should.





Registration No.:

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Set A

School of Automotive Skills

5th Semester, End-Sem. Examination

B. Voc. Program, Summer Semester (2020-21)

Course Code: AUT1504

Time: 2 Hour

Course Name: Paint Shop Management

Set A

Max. Marks: 50 marks

Instruction:

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

Section – A

10X01 = 10 Marks

Q-1. Painter A says, mixing room must have flash proof lights.

Painter B Says, flash proof light is not mandatory for paint mixing room.

Who is correct?

- | | |
|--------------|---------------------|
| a. Painter A | c. Both (a) and (b) |
| b. Painter B | d. None of these |

Q-2. Which type of paint is formulated using 1k binder?

- | | |
|-------------------|---------------------|
| a. Solid Paint | c. Pearl Paint |
| b. Metallic paint | d. Both (b) and (c) |

Q-3. Painter A says: Used thinner & paint material should be stored in a separate tank.

Painter B Says: Do not discard used thinner & paint material in the garbage as these are harmful for the environment.

Who is correct?

- | | |
|--------------|----------------------|
| a. Painter A | c. Both (a) and (b) |
| b. Painter B | d. None of the above |

Q-4. What are the possible causes for the pin holes in the paint film?

- | | |
|-----------------------------------|--|
| e. Improper cleaning of panel | g. Due to the moisture in compressed air |
| f. Due to improper Flash-off time | h. All of the above |

Q-5. Which type of disc is required for polishing?

- | | |
|-----------|---------------------|
| a. P-500 | c. P-2000 |
| b. P-1500 | d. Both (b) and (c) |



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Q-6. What is the effect on spray gun performance due to increase in number of air atomizing holes?

- a. Paint atomization will be good
- b. Both (a) and (c)
- c. Air discharge amount will be more
- d. None of these

Q-7. Why plastic parts are painted?

- a. To enhance the gloss
- b. To save from environmental effects
- c. Both (a) and (b)
- d. None of these

Q-8. Pot life refers to.....

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

Q-9. Orange peel defect generally occurs during which application?

- a. Primer
- b. Clear coat
- c. Base Coat
- d. All of the above

Q-10. Where we use the flop controller?

- a. In solid paint
- b. In metallic paint
- c. In Pearl paint
- d. Both (b) and (c)

Section – B

04X04 = 16 Marks

Q-11. What are the differences between High strength (H.S.) tinter and Low strength(L.S.) tinter?

Q-12. What are the probable causes of increased pressure inside the paint booth? Write its remedies.

Q-13. Write the factors which effect the transfer efficiency of a spray gun

Q-14. Write the Parameters involved in painting cost estimation.

Section – C

04X06 = 24 Marks

Q-15. Explain the various masking methods.

Q-16. Discuss any two environmental defect and paint application defects each with its causes and remedies.

Q-17. Make a checklist for spray booth maintenance.

Q-18. Write the SOP to make a design on a panel.



Registration No.:

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

5th Semester, End-Sem. Examination

B. Voc. Program, Summer Semester (2020-21)

Course Code: AUT1504

Course Name: Paint Shop Management

Instruction:

Time: 2 Hour

Max. Marks: 50 marks

Answer key

Set A

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

Section – A

10X01 = 10 Marks

Q-1. Painter A says, mixing room must have flash proof lights.

Painter B Says, flash proof light is not mandatory for paint mixing room.

Who is correct?

- | | |
|--------------|---------------------|
| a. Painter A | c. Both (a) and (b) |
| b. Painter B | d. None of these |

Q-2. Which type of paint is formulated using 1k binder?

- | | |
|-------------------|---------------------|
| a. Solid Paint | c. Pearl Paint |
| b. Metallic paint | d. Both (b) and (c) |

Q-3. Painter A says: Used thinner & paint material should be stored in a separate tank.

Painter B Says: Do not discard used thinner & paint material in the garbage as these are harmful for the environment.

Who is correct??

- | | |
|--------------|----------------------|
| a. Painter A | c. Both (a) and (b) |
| b. Painter B | d. None of the above |

Q-4. What are the possible causes for the pin holes in the paint film?

- | | |
|-----------------------------------|--|
| e. Improper cleaning of panel | g. Due to the moisture in compressed air |
| f. Due to improper Flash-off time | h. All of the above |

Q-5. Which type of disc is required for polishing?

- | | |
|-----------|---------------------|
| a. P-500 | c. P-2000 |
| b. P-1500 | d. Both (b) and (c) |

**BHARTIYA SKILL DEVELOPMENT UNIVERSITY**

Q-6. What is the effect on spray gun performance due to increase in number of air atomizing holes?

- a. Paint atomization will be good
- b. **Both (a) and (c)**
- c. Air discharge amount will be more
- d. None of these

Q-7. Why plastic parts are painted?

- a. To enhance the gloss
- b. To save from environmental effects
- c. **Both (a) and (b)**
- d. None of these

Q-8. Pot life refers to.....

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

Q-9. Orange peel defect generally occurs during which application?

- a. Primer
- b. **Clear coat**
- c. Base Coat
- d. All of the above

Q-10. Where we use the flop controller?

- a. In solid paint
- b. In metallic paint
- c. In Pearl paint
- d. **Both (b) and (c)**

Section – B

04X04 = 16 Marks

Q-11. What is the difference between H.S tinter and L.S. tinter?

Ans:- The H.S. Stands for high strength and the pigmentation of the H.S. is very high and we generally used these tinters in the solid paints.

The L.S. Stands for Low strength tinters and the pigmentation of L.S. is very low and generally used for metallic and pearl paints.

Q-12. What are the probable causes of increased pressure inside the paint booth? Write its remedies.

Ans:- There can be various reasons:-

1. Floor filters are choked so they will not allow the air to pass through.
2. Passage of exhaust air is blocked.
3. Exhaust blower is not working.

Q-13. Write the factors which effect the transfer efficiency of a 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-14. Write the Parameters involved in cost estimation?

Ans. There are various parameters involved in estimation of cost.

1. Correct identification of paint damage.
2. Product knowledge which will be used in the repair.
3. Prices of the product consumed in the repair.
4. Quantity of the product required for the repair.
5. Facility charges should also be considered in the estimation.
6. Time required for the repair to calculate the labor charges and facility charges.

Section – C

04X06 = 24 Mark

Q-15. Explain the various masking methods.

Ans:- **1. Masking for Surface Application**:-

- During surfacer application, we use generally lower air pressure if compared with top coat.
- The reverse masking method is generally used to prevent the creation of spray step.

Reverse Masking:-

- It is a method in which the masking paper is applied with its inside out, so that only a thin coat of mist adheres along the border.
- It is used to reduce the creation of spray step while working with small areas like spot repainting.

2. Masking for Block Repainting:-

- For Block repainting, Panels such as fender or door must be masked individually.
- In case the panel has openings (like gap between panels etc.) they must be masked to prevent the paint mist from entering those areas.

3. Masking for spot repainting:-

a. For Repainting a quarter panel:-

- When repainting a panel without borders we need to ensure that there should not be any spray step.
- We use reverse masking in such cases to avoid spray step.

b. For Repainting the end of a fender:-

- To repaint the tip of a fender, the area must be repainted by spot repainting.
- Since the smaller area is repainted than block repainting, mask only the end part of fender suffices.

Q-16. Discuss any two environmental defect and paint application defects each with its prevention and remedies.

Ans

1. Runs

Causes:-

- Incorrect spraying viscosity, spraying technique.
- Defective spray gun set up.
- Incorrect spraying pressure.
- Temperature of paint, substrate or spray booth too low.
- Incorrect choice of hardeners and thinners

Prevention:-

- Ensure that the spray gun is in good working order.
- Warm object and material up to room temperature of 20 °C/68 °F.

- Use correct combination of hardeners and thinners .
-

Remedies:-

- Sand and polish.
- Sand and repaint

2. water spotting

Causes:-

- Topcoat not sufficiently cured.
- Excessive film thickness, drying time too short.
- Use of unsuitable thinner.
- Incorrect hardener mixing ratio.
- Wrong hardener used

Prevention:-

- Follow application recommendations on technical data sheets

Remedies:-

- After through-drying, remove marks by polishing
- Thoroughly dry topcoat, sand and repaint

3. Color fade

Causes:-

- Incorrect spraying viscosity, spraying technique, flash-off times, spray booth temperature.
- Defective spray gun set up, incorrect spraying pressure.
- Use of unsuitable thinner.

Prevention:-

- Adjust material correctly.
- Keep spray gun parallel to object.
- Choose suitable spray gun set up.
- Use manufacturer's thinners.

Remedies:-

- When using conventional base coat: use droplet method before spraying clear.
- After clear has through-dried, sand surface and repaint.

4. Bird droppings

Causes:-

- Due to shit of birds.
- Insufficient isolation of the stopper before topcoat application

Prevention:-

- Use recommended grade sanding paper.
- Isolate repaired areas with 2K filler.
- Dry filler thoroughly.

Remedies:-

- Thoroughly dry and sand.

Isolate or remove substrate, repaint

Q-17. Write the process for spot repair using metallic paint.

Ans:- Carefully clean with Prepsol

1. Make sure that the surfacer area is as small as possible.
2. sanding pad using P2000 wet grit paper
3. Blow parts with compressed air, clean with degreaser and wipe with a tack cloth
4. Mix Basecoat as per TDS
5. Apply basecoat:
6. until surfacer (damaged) area is fully covered by overlapping each coat slightly so a "dust zone" remains.
7. Prepare midcoat:-

67% Binder XB165 and 33% thinner XB387

9 Prepare Blend in:-

Mix 50% Basecoat with 50% Midcoat and reduce pressure during fade out so a smooth transition is achieved

8. Mix clear coat as per TDS
9. Apply 2.5 coats extending basecoat area
10. Blend in:

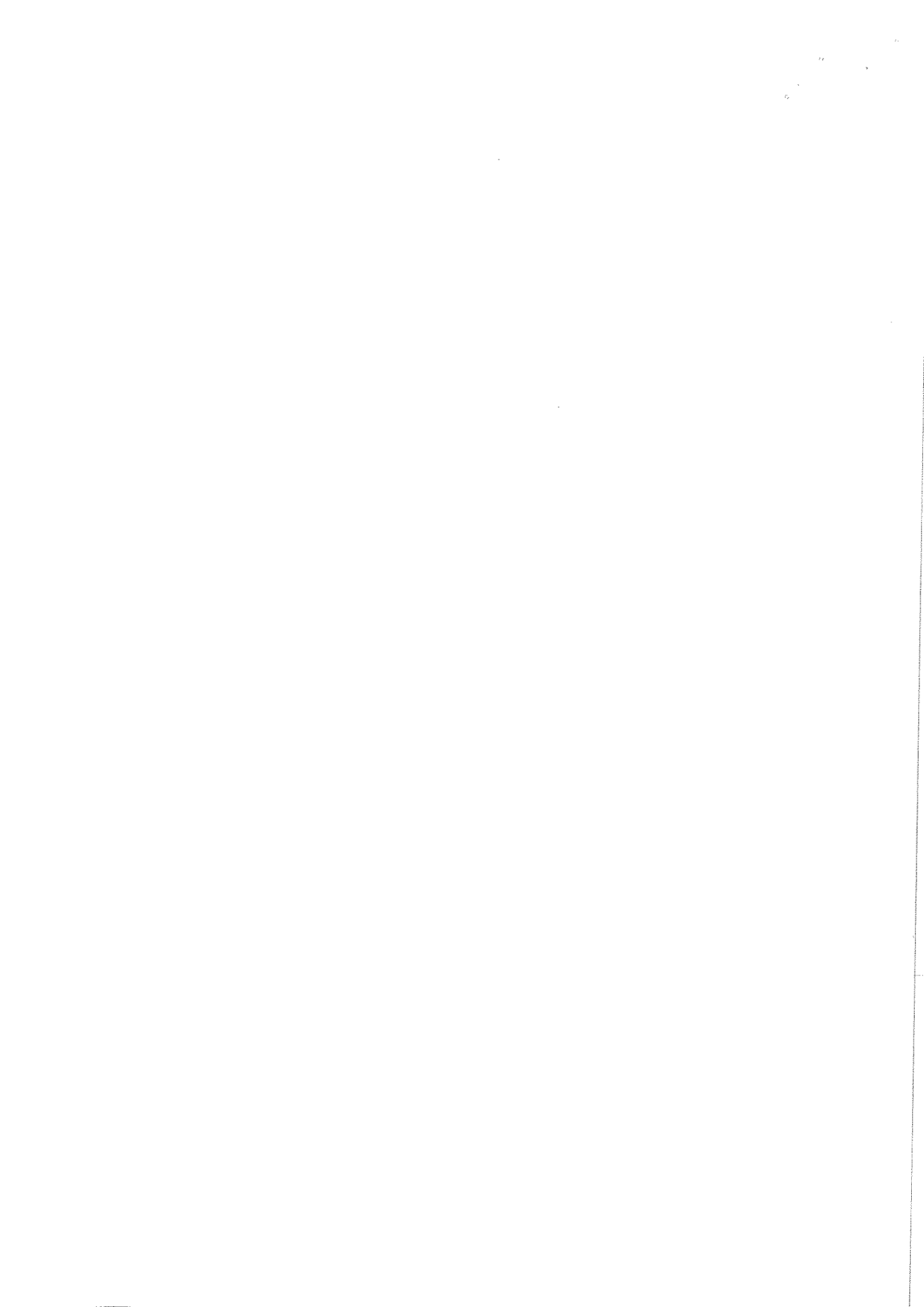
Mix 50% Clearcoat with 50% Blending thinner and reduce pressure during fade out so a smooth transition is achieved.

11. Apply Blending thinner on over spray area.
12. If repair area is in middle or bigger than A4 size, apply Clear Coat on full panel
13. After drying polish the blend-in areas.

Q-18. Write the Steps to make a design on a panel.

Ans.

1. Clean the panel.
2. Scuff the panel
3. Primer application
4. Sanding of primer
5. Sketch the design on the panel with the help of pencil.
6. Mask the design with the help of fine line masking tape.
7. Before basecoat check the masking properly.
8. Apply basecoat.
9. Remove the masking carefully after proper drying.
10. Mask the painted design properly with the help of masking tapes and papers.
- 11 Apply different basecoat on the panel.
12. After proper drying of basecoat remove the masking.
13. Check the edges and sand carefully with P-500 carefully.
14. Apply the clear coat on the panel.





Registration No.:

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Set B

School of Automotive Skills

5th Semester, End-Sem. Examination

B. Voc. Program, Summer Semester (2020-21)

Course Code: AUT1504

Set B

Time: 2 Hour

Course Name: Paint Shop Management

Max. Marks: 50 marks

Instruction:

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

Section – A

10X01 = 10 Marks

Q-1. Which of the following variables does not affect the drying time of coating?

- | | |
|--------------------------|----------------------|
| a. Air flow and movement | c. Type of substrate |
| b. Surface temperature | d. Solvent selection |

Q-2. How many angles are required to inspect a color?

- | | |
|--------|------------------|
| a. One | c. Three |
| b. Two | d. None of these |

Q-3. Painter A says: Used thinner & paint material should be stored in a separate tank.

Painter B Says: Do not discard used thinner & paint material in the garbage as these are harmful for the environment.

Who is correct??

- | | |
|--------------|----------------------|
| a. Painter A | c. Both (a) and (b) |
| b. Painter B | d. None of the above |

Q-4. What are the possible causes for the pin holes in the paint film?

- | | |
|-----------------------------------|--|
| a. Improper cleaning of panel | c. Due to the moisture in compressed air |
| b. Due to improper Flash-off time | d. All of the above |

Q-5. Where we use the flop controller?

- | | |
|----------------------|---------------------|
| a. In solid paint | c. In Pearl paint |
| b. In metallic paint | d. Both (b) and (c) |

**BHARTIYA SKILL DEVELOPMENT UNIVERSITY**

Q-6. What is the effect on spray gun performance due to increase in number of air atomizing holes?

- a. Paint atomization will be good
- b. Both (a) and (c)
- c. Air discharge amount will be more
- d. None of these

Q-7. Why plastic parts are painted?

- a. To enhance the gloss
- b. To save from environmental effects
- c. Both (a) and (b)
- d. None of these

Q-8. Which of the following paint layer is not a part of refinish painting?

- a. Zinc Phosphate
- b. Body Filler
- c. Epoxy primer
- d. None of the above

Q-9. Orange peel defect generally occurs during..... application.

- a. Primer
- b. Clear coat
- c. Base Coat
- d. All of the above

Q-10. What is the recommended distance between infrared lamp and panel?

- a. 80mm
- b. 100mm
- c. 80 cm
- d. 140cm

Section – B

04X04=16 Marks

Q-11. What will be the probable causes in Paint booth if the pressure inside the paint booth is too high? Write its remedies?

Q-12. Write the SOP for color matching.

Q-13. Write the SOP for Plastic painting of a new panel.

Q-14. Write the Parameters involved in Painting cost estimation.

Section – C

04X06 =24 Marks

Q-15. Explain different types of borders used in masking.

Q-16. What is the role of damper in the paint booth? What will happen if the damper does not function properly?

Q-17. Write the SOP for spot repair using metallic paint.

Q-18. Explain any four Paint application defects with its causes and remedies.



Registration No.:

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

5th Semester, End-Sem. Examination

B. Voc. Program, Summer Semester (2021-22)

Course Code: AUT1504

Course Name: Paint Shop Management

Instruction:

Time: 2 Hour

Max. Marks: 50 marks

Answer key

Set B

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

Section – A

10X01 = 10 Marks

Q-1. Which of the following variables does not affect the drying time of coating?

- | | |
|--------------------------|----------------------|
| a. Air flow and movement | c. Type of substrate |
| b. Surface temperature | d. Solvent selection |

Q-2. How many angles are required to inspect a color?

- | | |
|--------|------------------|
| a. One | c. Three |
| b. Two | d. None of these |

Q-3. Painter A says: Used thinner & paint material should be stored in a separate tank.

Painter B Says: Do not discard used thinner & paint material in the garbage as these are harmful for the environment.

Who is correct??

- | | |
|--------------|----------------------|
| a. Painter A | c. Both (a) and (b) |
| b. Painter B | d. None of the above |

Q-4. What are the possible causes for the pin holes in the paint film?

- | | |
|-----------------------------------|--|
| a. Improper cleaning of panel | c. Due to the moisture in compressed air |
| b. Due to improper Flash-off time | d. All of the above |

Q-5. Where we use the flop controller?

- | | |
|----------------------|---------------------|
| a. In solid paint | c. In Pearl paint |
| b. In metallic paint | d. Both (b) and (c) |

**BHARTIYA SKILL DEVELOPMENT UNIVERSITY**

Q-6. What is the effect on spray gun performance due to increase in number of air atomizing holes?

- a. Paint atomization will be good
- b. **Both (a) and (c)**
- c. Air discharge amount will be more
- d. None of these

Q-7. Why plastic parts are painted?

- a. To enhance the gloss
- b. To save from environmental effects
- c. **Both (a) and (b)**
- d. None of these

Q-8. Which of the following paint layer is not a part of refinish painting?

- a. **Zinc Phosphate**
- b. Body Filler
- c. Epoxy primer
- d. None of the above

Q-9. Orange peel defect generally occurs during..... application.

- a. Primer
- b. **Clear coat**
- c. Base Coat
- d. All of the above

Q-10. What is the recommended distance between infrared lamp and panel?

- a. 80mm
- b. 100mm
- c. **80 cm**
- d. 140cm

Section – B

04X04=16 Marks

Q-11. What will be the probable causes in Paint booth if the pressure inside the paint booth is too high? Write its remedies?

Ans There can be various reasons:-

1. Floor filters are choked so they will not allow the air to pass through.
2. Passage of exhaust air is blocked.
3. Exhaust blower is not working.
4. Variation in the speed of both the blowers

Q-12. Write the steps for color matching.

Ans:-

1. Inspect the damage.
2. Find the shade card of the color in natural day light.
3. Formulate the color.

4. Apply on flexible panels.
5. Match the panel with vehicle color.
6. If color does not match do the tinting or shading of the color.
7. Repeat the process until color does not match.

Q-13. Write the steps for Plastic painting of a new panel.

Ans:-

- Heat plastic parts for 60 minutes at +60°C object temperature
 - Carefully clean with antistatic cleaner
 - Heat plastic parts for 30 - 40 minutes at +60°C object temperature
 - Lightly clean parts once more with antistatic cleaner
 - Apply 1.5 coats of plastic primer / sealer
 - Flash off time 5-10 mins
 - Putty(for minor damages)
 - Mix putty according to TDS and apply
 - Drying:Air dry- 20-30 minutes at 20°C
 - IR – 3 minutes short
 - Sanding:first sanding second sanding Primer surfacer
 - Blow parts with compressed air, lightly clean once more and wipe with a tack cloth
 - mix the primer surfacer
 - apply 1 tack coat followed by a normal full coat.
Clean with degreaser and wipe with a tack cloth; blow part with compressed air (not with wet-on-wet application)
 - mix the base coat
 - apply
- a) 2.5 coats for metallic/two stage pearl colors = 15 - 20µm
- b) 2.5 coats of under coat followed by 1.5-2 coats of basecoat for three-stage pearl colors = 40 - 45µm
- intermediate flash-off time: 5 - 10 minutes
 - flash-off time before clear coat: 15 - 20 min.
 - mix clear coat
 - apply 1.5 coats of glossy / semiglossy / matt clear coat as per the need

Flash-off

- Oven Bake: according to TDS
- IR Drying: according to TDS

Q-14. Write the Parameters involved in cost estimation.

Ans. There are various parameters involved in estimation of cost.

1. Correct identification of paint damage.
2. Product knowledge which will be used in the repair.
3. Prices of the product consumed in the repair.
4. Quantity of the product required for the repair.

5. Facility charges should also be considered in the estimation.
6. Time required for the repair to calculate the labor charges and facility charges.

Section – C

04X06 =24 Marks

Q-15. Explain different types of borders used in masking.

- Ans The area that separates the painted area from non-painted area is called a Border.
- It is important to select the border on the extent of repair and condition of old paint.

Borders for masking :-

1. Borders over gaps between panels.
2. Borders over body sealers.
3. Borders over crests of character lines.
4. Borders on the flat portion of panel

Q-16. What is the role of damper in the paint booth? What will happen if the damper does not function properly?

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.

Q-17. Write the process for spot repair using metallic paint.

Ans:- Carefully clean with Prepsol

1. Make sure that the surfacer area is as small as possible.
2. sanding pad using P2000 wet grit paper
3. Blow parts with compressed air, clean with degreaser and wipe with a tack cloth
4. Mix Basecoat as per TDS
5. Apply basecoat:
6. until surfacer (damaged) area is fully covered by overlapping each coat slightly so a "dust zone" remains.
7. Prepare midcoat:-
67% Binder XB165 and 33% thinner XB387

9 Prepare Blend in:-

Mix 50% Basecoat with 50% Midcoat and reduce pressure during fade out so a smooth transition is achieved

8. Mix clear coat as per TDS

9. Apply 2.5 coats extending basecoat area

10. Blend in:

Mix 50% Clearcoat with 50% Blending thinner and reduce pressure during fade out so a smooth transition is achieved.

11. Apply Blending thinner on over spray area.

12. If repair area is in middle or bigger than A4 size, apply Clear Coat on full panel

13. After drying polish the blend-in areas.

Q-18. Explain any four Paint application defects with its causes and remedies.

Ans:- 1.Runs

Causes:-

- Incorrect spraying viscosity, spraying technique.
- Defective spray gun set up .
- Incorrect spraying pressure .
- Temperature of paint, substrate or spray booth too low.
Incorrect choice of hardeners and thinners

Prevention:-

- Ensure that the spray gun is in good working order.
- Warm object and material up to room temperature of 20 °C/68 °F.
- Use correct combination of hardeners and thinners .
-

Remedies:-

- Sand and polish.
- Sand and repaint

2. water spotting

Causes:-

- Topcoat not sufficiently cured.
- Excessive film thickness, drying time too short.
- Use of unsuitable thinner.
- Incorrect hardener mixing ratio.
- Wrong hardener used

Prevention:-

- Follow application recommendations on technical data sheets

Remedies:-

- After through-drying, remove marks by polishing
- Thoroughly dry topcoat, sand and repaint

3.Clouding

Causes:-

- Incorrect spraying viscosity, spraying technique, flash-off times, spray booth temperature.
- Defective spray gun set up, incorrect spraying pressure.
- Use of unsuitable thinner.

Prevention:-

- Adjust material correctly.
- Keep spray gun parallel to object.
- Choose suitable spray gun set up.
- Use manufacturer's thinners.

Remedies:-

- When using conventional base coat: use droplet method before spraying clear.
- After clear has through-dried, sand surface and repaint.

4. sanding scratches

Causes:-

- Sanding paper too coarse.
- Filler sanded when soft.
- Insufficient sanded polyester stopper.
- Insufficient isolation of the stopper before topcoat application

Prevention:-

- Use recommended grade sanding paper.
- Isolate repaired areas with 2K filler.
- Dry filler thoroughly.

Remedies:-

- Thoroughly dry and sand.
Isolate or remove substrate, repaint

