# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

**School of Automotive Skills**

**Session: 2019-20 (Summer semester)**

**B. Voc. V$^{Th}$ Semester,**

**2$^{nd}$ In-Sem. Examination**

**Course Code: AUT 1501** **Time: 1 Hour**

**Course Name: Mechatronics** **Max. Marks: 20**

**Instruction**: (a) All questions are compulsory

(b) Scientific non-programmable calculators are permitted.

(c) Any data not given may be assumed if necessary and assumptions mentioned.

(d) Attempt Question No 11 on the sheet and attach it with the answer book.

(e) Write name and Registration Number on the sheet for Question No 11.

**Section – A**
**(choose the correct option)** 05X01 = 05 Marks

**1**.Traction Control System is also called .....

(a) Electronically Controlled Limited Slip Differential.

(b) Torque Sensitive Limited Slip Differential.

(c) Anti- Slip Regulation

(d) None of the above.

**2.** The driver can control the vehicle only till the float angle is up to.....

(a) 12 degrees.

(b) 8 degrees.

(c) 38 degree

(d) 9.2 degree.

**3.** ABS is generally .....

(a) Always on when ignition is turned on.

(b) Switches on only when driver applies brakes.

(c) Switches on above vehicle speed of 20 kmph.

(d) None of the above.

**4.** The Sensotronic Brake System has two micro controllers--- True/ False.

**5.** The Dry Brake Function operates when

(a) The wind screen wiper is switched on.

(b) When there is wheel slipping on any wheel.

(c) Each time ignition is switched on.

(d) When vehicle speed exceeds 80 kmph.

## Section – B

03X02 = 06 Marks

**6.** Write short note on Primary and Secondary functions of Braking System.

**7.** The role of pump in ABS is only to return brake fluid to the master cylinder. Please explain if this statement is true or false and give reasons.

**8.** List out driving limits when ESP intervenes to enhance directional stability and explain coasting.

## Section – C

03X03 = 09 Marks

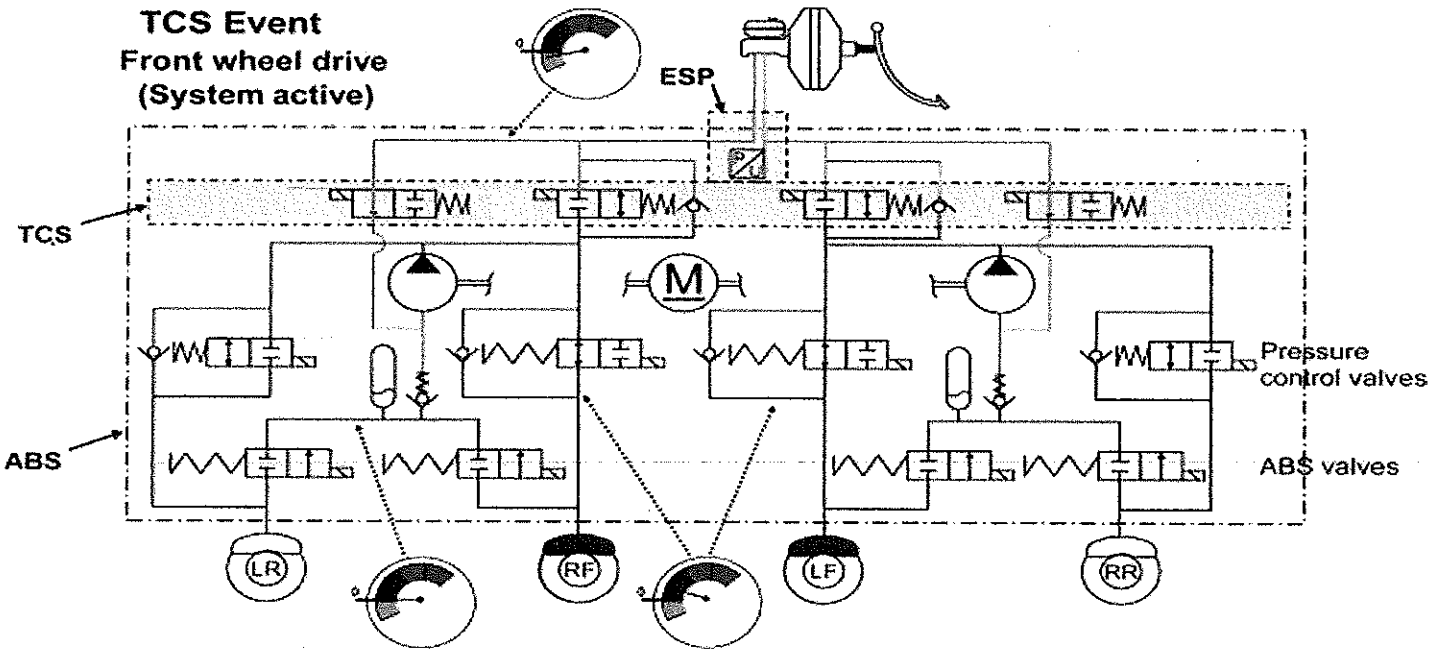
**9.** Explain the features and working of Automatic Emergency Brakes.

**10.** What are the two types of fuel pumps used in CRDI Systems? Explain the features of any one of them.

**Name** ..... **Registration No**.....

**NOTE: Please attach this sheet with the answer sheet.**

**11.** Label the diagram and trace the hydraulic circuit when the ABS is operative for LR wheel.



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

**School of Automotive Skills**

**Session: 2019-20 (Summer / ~~Winter Semester~~)**

**B. Voc. V$^{Th}$ Semester,**

**2$^{nd}$ In-Sem. Examination**

**Course Code: AUT 1501** **Time: 1 Hour**

**Course Name: Mechatronics** **Max. Marks: 20**

## Section – A

**( choose the correct option)** 05X01 = 05 Marks

**1**.Traction Control System is also called .....

(c) Anti- Slip Regulation

**2.** The driver can control the vehicle only till the float angle is upto.....

(b) 8 degrees.

**3.** ABS is generally .....

(c) Switches on above vehicle speed of 20 kmph.

**4.** The Sensotronic Brake System has two micro controllers--- True

**5.** The Dry Brake Function operates when

(a) The wind screen wiper is switched on.

## Section – B

03X02 = 06 Marks

**Ans 6.** Write short note on Primary and Secondary functions of Braking System.

The primary functions of the brake system are

- reduce vehicle speed
- bring the vehicle to a halt
- keep the vehicle stationary

In today's age of electronics since a lot of sensors and ECU are being used there are certain conditions when braking can be used for secondary functions also like

- to maintain directional stability while braking, coasting, load changes,fear/panic reactions, accelerating.

These are conditions where stability of vehicle is maintained by using the brake system and ensuring that the vehicle does not go out of control.

It can also be used for collision avoidance.

**Ans 7.** The role of pump in ABS is only to return brake fluid to the master cylinder. Please explain if this statement is true or false and give reasons.

The statement is true as during ABS operation the pump is only used to return the fluid to the master cylinder.

ABS is a condition when the driver has applied brakes and it is important that adequate brake fluid is available in the master cylinder. The pump should not in any way supply fluid under pressure for brake application as it will lead to the driver loosing control over the braking system.
Also it is important that the master cylinder does not starve of brake fluid.

**Ans 8.** List out driving limits when ESP intervenes to enhance directional stability and explain coasting.
The driving limits are conditions wherein under certain operating conditions the directional stability of the vehicle is disturbed and the driver has lost or is likely to loose control over the vehicle. Under such conditions the ESP ensures that the directional stability is maintained
These could be
- full braking when some emergency has arisen and due to which the vehicle may skid or wheels may slip.
-partial braking under bad road conditions, on ice or slippery roads.
-coasting
-accelerating suddenly where load shifting may disturb the brake force distribution or traction.
-extreme steering manouvers.
**Coasting** : Coasting is a condition when the driver has pressed the clutch and vehicle is freely rolling. The vehicle is unstable in this condition as the engine is not assisting in the braking process in case that is required.

**Section – C**

03X03 = 09 Marks

**Ans 9.** Explain the features and working of Automatic Emergency Brakes.
The main features apart from Emergency Braking are
- Hill Descent Control where it assists a driver during descent and applies brakes automatically without driver intervention and the driver is left free to concentrate on the steering.
- Adaptive Cruise Control- where in the distance with the object in front is constantly monitored and the speed of the vehicle controlled accordingly.
The AEB functions by using camera or/and radar sensors, day or/and night or may be only in reverse where is case of an imminent crash the driver is first warned and in case no action is taken by the driver the ECU applies brakes to avoid/ minimise the impact of crash. So basically it warns, applies little brake to draw attention then further application of brakes and still if driver does not respond full emergency brakes are applied.

**Ans 10.** What are the two types of fuel pumps used in CRDI Systems ? Explain the features of any one of them.

There are two or more types of pumps used in CDRI Systems though the two main are

- Electric fuel pump
- Gear Pump

**Electric Pump:**

These are in tank type of pumps for low pressure side .

- more widely used-use carbon commutators
- pressure is independent of engine speed thus improves starting response.

Using a controlled electric fuel pump results in lower power demand thus carbon di oxide advantage.

- it permits parallel operation of suction jet pumps thus improve swirl in the swirl pot
- its electrically operated thus easy for control by ECU

**Gear Pumps**

- engine speed governs the pressure build up thus chances of air lock
- starts operation only when the engine is turned on thus again there are chances of an air lock and difficult to generate swirl in the tank thus engine at low rpm may starve

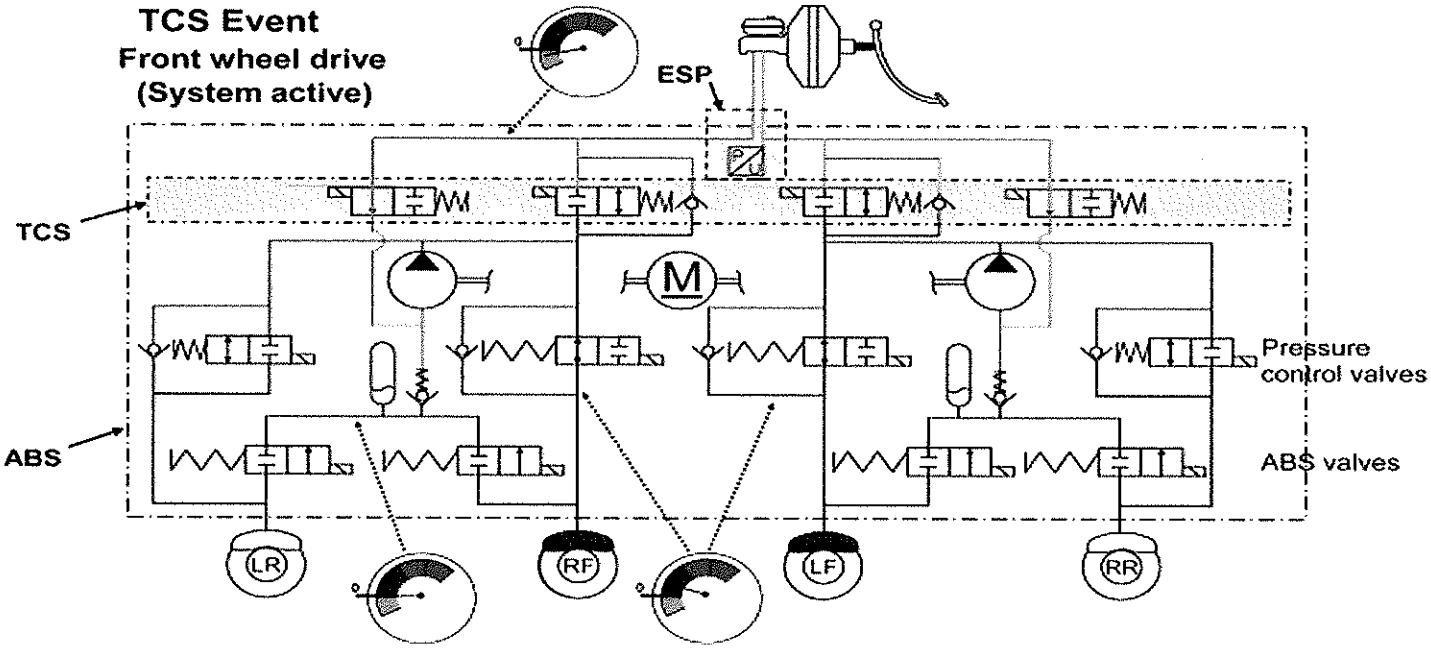
-more useful on high pressure side.

- capable of building higher pressures but more prone to wear and tear
- since mechanically operated it is difficult to be directly controlled by ECU, it may need additional valves etc for pressure control.

**Name** ..... **Registration No**.....

**NOTE: Please attach this sheet with the answer sheet.**

**11.** Label the diagram and trace the hydraulic circuit when the ABS is operative for LR wheel.



Registration No.: .....

# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

**School of Automotive Skills**

**Session 2019-20, Summer Semester**

**B. Voc. Program, 5th Semester,**

**2nd 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

Q 1. What is not necessary in a circuit diagram?

a. Device designation.
b. Wiring.
c. Location in the vehicle.
d. Connection or terminal designation.

Q 2. When do you use a block diagram in the workshop?

a. For a detailed overview.
b. To locate the devices in the car.
c. For a quick overview.
d. To find the terminal designations.

Q 3. Which system provides the fastest data transfer rates?

a. CAN-C.
b. CAN-FD.
c. LIN.
d. CAN-B.

Q 4. LIN communication is typically used to communicate with.

a. central locking system.
b. engine control unit.
c. airbag system (SRS).
d. powertrain control unit.

Q 5. Which topology is used for CAN systems?

a. Ring.
b. Bus.
c. Star.
d. Tree.

## Section – B

03X02 = 06 Marks

All the following questions are related to the circuit diagram!

Q 6. What type of engine is it? (fuel type, number of cylinders) Justify your answer with 4 different examples?

Q 7. What kind of load sensor is installed, name the device number?

Q 8. What is the difference between  and  ?

## Section – C

03X03 = 09 Marks

Q 9. Sketch the complete "fuel pump load circuit" in red.

Q 10. What are the connector E pins 1-6 used for, name the color codes?

Q 11. Why are the letters A,B,C,D in brackets [ ]?

## Electronic Control System Circuit Diagram

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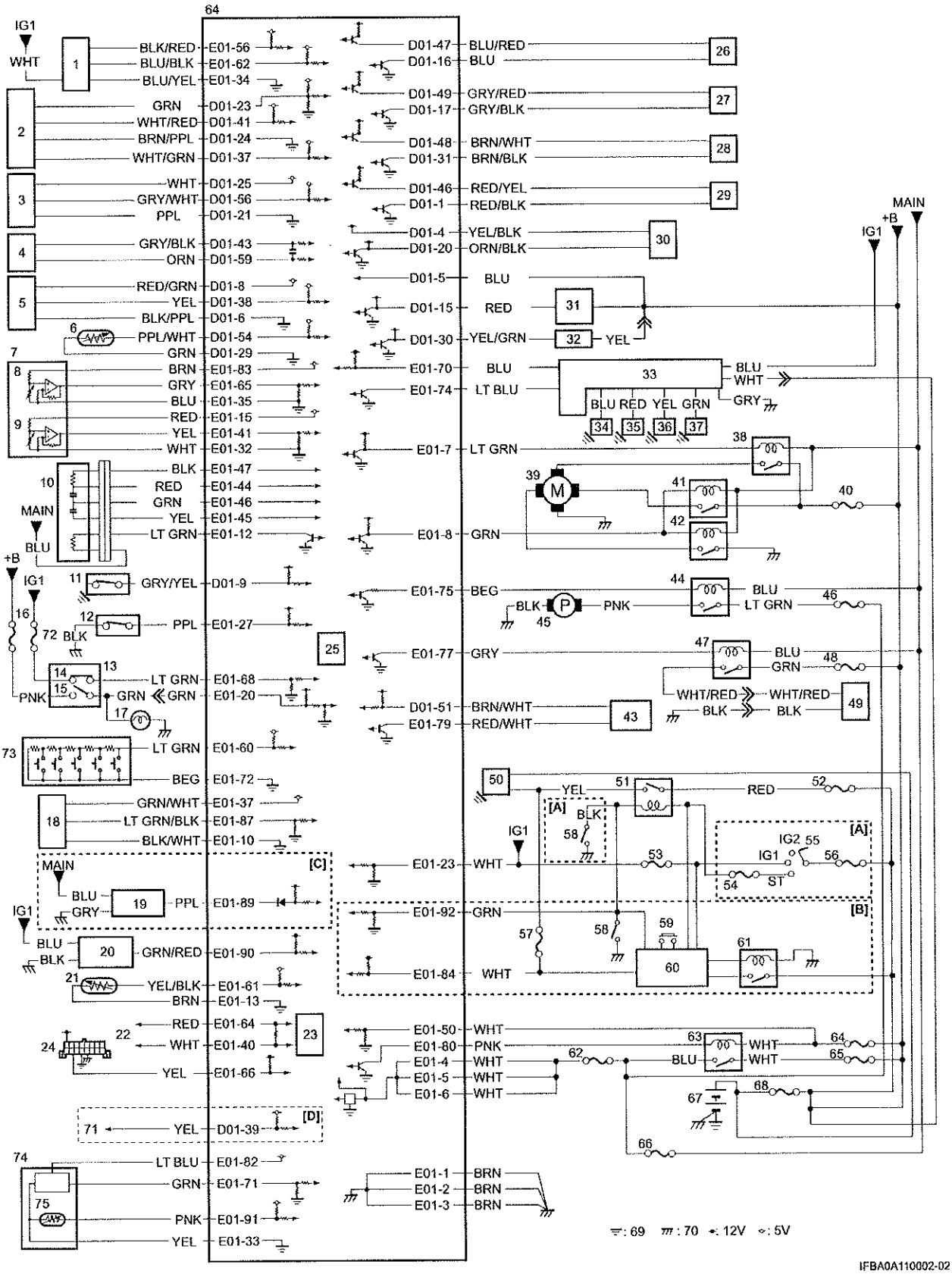


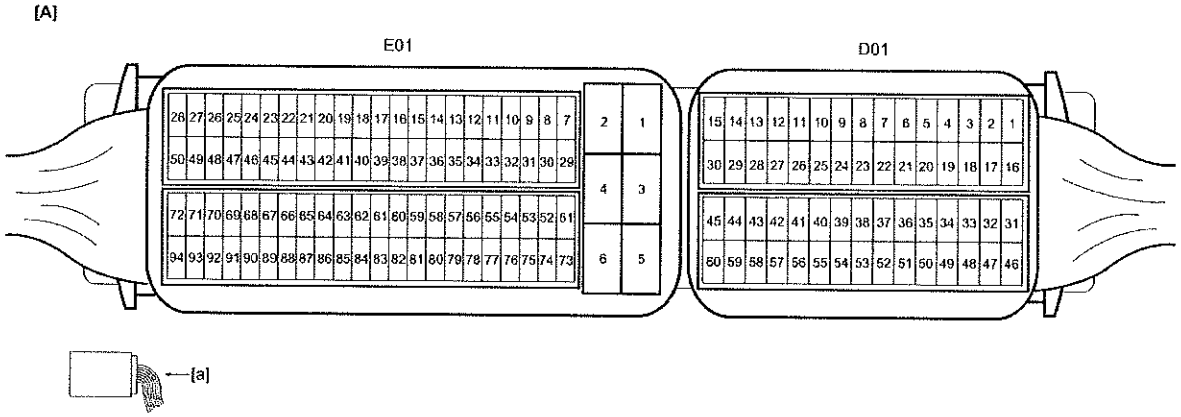

IFBA0A110002-02

| | | |
|---|---|---|
| [A]: Ignition switch model | 24. DLC | 51. Starting motor control relay |
| [B]: Keyless push start model | 25. Barometric pressure sensor | 52. "ST" fuse |
| [C]: Non-ABS model | 26. Fuel injector No.1 | 53. "IG COIL" fuse |
| [D]: Manual A/C model | 27. Fuel injector No.2 | 54. "ST SIG" fuse |
| 1. MAF sensor with IAT sensor-1 | 28. Fuel injector No.3 | 55. Ignition switch |
| 2. Boost pressure sensor with IAT sensor-2 | 29. Fuel injector No.4 | 56. "IGN" fuse |
| 3. CMP sensor | 30. Fuel flow actuator | 57. "ST SIG2" fuse (Keyless push start model) |
| 4. CKP sensor | 31. EGR valve | 58. CPP No.1 switch |
| 5. Fuel pressure sensor | 32. Boost pressure control solenoid valve | 59. Engine switch (Keyless push start model) |
| 6. ECT sensor | 33. Glow plug control module | 60. Keyless start control module (Keyless push start model) |
| 7. APP sensor | 34. Glow plug No.1 | 61. IG1 relay (Keyless push start model) |
| 8. APP sensor (main) | 35. Glow plug No.2 | 62. "INJ DRV" fuse |
| 9. APP sensor (sub) | 36. Glow plug No.3 | 63. Main relay |
| 10. A/F sensor | 37. Glow plug No.4 | 64. "ECM" fuse |
| 11. Oil pressure switch | 38. Radiator cooling fan relay 1 | 65. "FI" fuse |
| 12. CPP No.2 switch | 39. Radiator cooling fan motor | 66. "FI2" fuse |
| 13. Brake light switch / Brake switch | 40. "RDTR" fuse | 67. Battery |
| 14. Brake switch | 41. Radiator cooling fan relay 2 | 68. "FL" fuse |
| 15. Brake light switch | 42. Radiator cooling fan relay 3 | 69. Engine ground |
| 16. "STOP" fuse | 43. Generator | 70. Ground |
| 17. Brake light | 44. Fuel pump relay | 71. To blower speed resistor |
| 18. A/C refrigerant pressure sensor | 45. Fuel pump | 72. "CRUISE" fuse |
| 19. VSS | 46. "F/P" fuse | 73. Cruise control switch |
| 20. Fuel filter water detection sensor | 47. A/C compressor relay | 74. Electric load current sensor |
| 21. Fuel temperature sensor | 48. "CPRSR" fuse | 75. Battery temperature sensor |
| 22. To other control module | 49. A/C compressor | |
| 23. CAN driver | 50. Starting motor | |

### Terminal Arrangement of ECM Connector

**NOTE**

**For circuit names and terminal voltages, refer to "Inspection of ECM and Its Circuits" (Page 1A-158).**




IDAA0A112005-01

[A]: ECM connector (View: [a])

## Component Location

### Electronic Control System Component Location

AENFBA0A1103001

# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

**School of Automotive Skills**
**5th Semester, 2nd In-Sem. Examination**
**B. Voc. Program, Summer Semester (2018-19)**

**Course Code: AUT1502** **Time: 1 hour**
**Course Name: Automotive Hybrid Vehicle** **Max. Marks: 20**

## Section – A

**Q 1.** What is not necessary in a circuit diagram?
**Answer** – C. Location in the vehicle

**Q 2.** When do you use a block diagram in the workshop?

**Answer** – C. For a quick overview.

**Q 3.** Which system provides the fastest data transfer rates?
**Answer** – B. CAN-FD.

**Q 4.** LIN communication is typically used to communicate with..
**Answer** – A. ..central locking system.

**Q 5.** Which topology is used for CAN systems?
**Answer** – B. Bus.

## Section – B

All the following questions are related to the circuit diagram!

**Q 6.** What type of engine is it? (fuel type, number of cylinders) Justify your answer with 4 different examples?
**Answer – Diesel, 4 cylinder engine**

- Cylinder: 4 injectors (26-29)
- Cylinder: 4 glow plugs (34-37)
- Type: diesel, glow plug control module (33)
- Type: diesel, fuel filter water detection sensor (20)

**Q 7.** What kind of load sensor is installed, name the device number?
**Answer** – Mass air flow sensor with intake air temperature sensor, device nr. 1

**Q 8.** What is the difference between ⏚ and ⏚ ?
**Answer** – the first symbol means that the ground point is on the engine (69) and the second symbol is used for the "ordinary" ground point on the vehicle (chassis)

## Section – C

**Q 9.** Sketch the complete "fuel pump load circuit" in red.
**Answer** – see circuit diagram.

# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

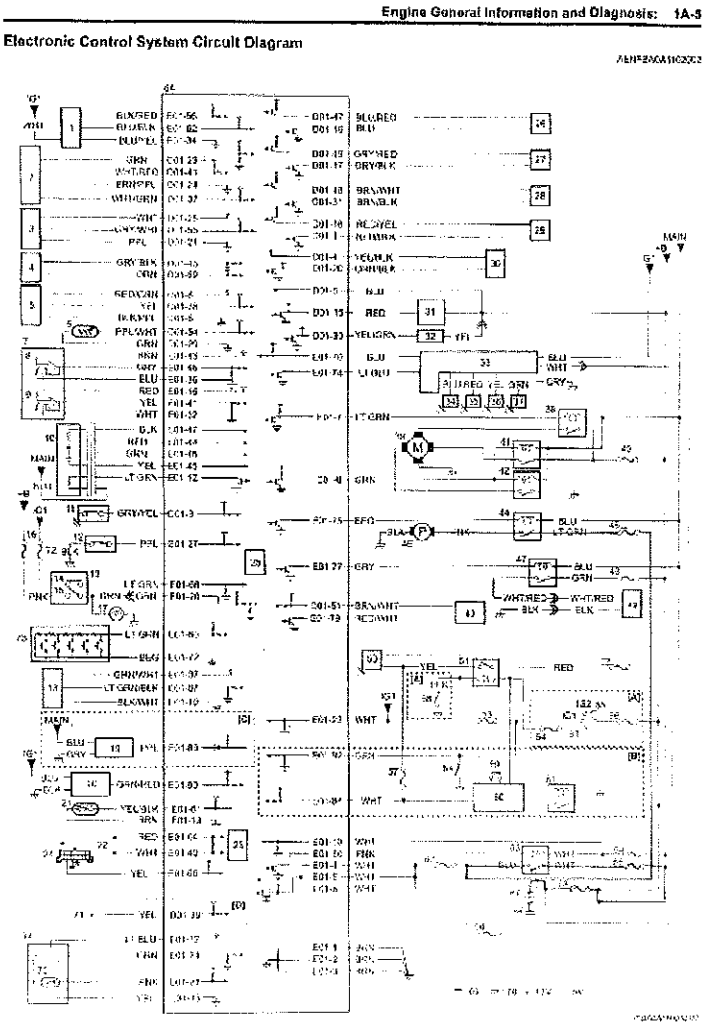
**Q 10.** What are the connector E pins 1-6 used for, name the colour codes?
**Answer** – Pins 1-3 are used for the ECM ground. Colour code: brown

Pins 4-6 are used for the EMS power supply. Colour code: white

**Q 11.** Why are the letters A,B,C,D in brackets []?
**Answer – 1.**

This is mentioned for vehicles which are equipped with these systems (Igintion switch model, keyless push start, non ABS model and manual A/C model.

Whenever you work on a car, you have to know if your vehicle is equipped with the specific system. If not, forget the letters! It is just to reduce the amount of circuit diagrams so you can use that specific diagram for all the models (no matter If they are equipped with these systems or not!)



# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

**School of Automotive Skill**

**Session: 2019-20 (Summer Semester)**

**B. Voc. Program, 5th Semester**

**2nd In-Sem. Examination**

**Course Code : AUT1503** **Time : 1 Hour**

**Course Name: Workshop Management** **Max. Marks : 20**

**Instructions:**

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

1. Fish bone diagram is also known as
   a. Cause and effect chart.
   b. Ishikawa diagram.
   c. Both a and b.
   d. None of the above.

2. Which type of chart uses the rule of 20:80?
   a. Cause and effect chart.
   b. ABC chart.
   c. Fish bone diagram.
   d. Control chart.

3. Quality circle usually consists of how many members?
   a. 15-20
   b. 7-10
   c. 4-5
   d. 20-25

4. Maintainability defines
   a. Down time of the machine.
   b. Time to bring back the machine to working condition.
   c. Failure Rate of the machine.
   d. Reliability of the machine.

5. PDCA stands for
   a. Plan Do Check Act.
   b. Product Development Check Analysis.
   c. Plan Develop Criticize Action.
   d. Product Destructive Check Analysis.

## Section – B

03X02 = 06 Marks

1. Briefly define Poka-Yoke.
2. What are the key principles of KAIZEN?
3. Define Reliability and Failure Rate.

## Section – C

03X03 = 09 Marks

1. What is Fishbone diagram? Explain with a suitable example.
2. What is Quality Circle and who invented it?
3. An amplifier has an exponential time to time failure distribution with a failure rate of 8% per 1000 hours. What is the reliability of the amplifier at 5000 h? Find the MTTF.

# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

**School of Automotive Skill**

**Session: 2019-20 (Summer Semester)**

**B. Voc. Program, 5th Semester**

**2nd In-Sem. Examination**

**Course Code : AUT1503** **Time : 1 Hour**

**Course Name: Workshop Management** **Max. Marks : 20**

**Instructions:**

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

1. Fish bone diagram is also known as
   a. Cause and effect chart.
   b. Ishikawa diagram.
   c. Both a and b.
   d. None of the above.

   **Ans. c. Both a and b**

2. Which type of chart uses the rule of 20:80?
   a. Cause and effect chart.
   b. ABC chart.
   c. Fish bone diagram.
   d. Control chart.

   **Ans. b. ABC chart**

3. Quality circle usually consists of how many members?
   a. 15-20
   b. 7-10
   c. 4-5
   d. 20-25

   **Ans. b. 7-10**

4. Maintainability defines
   a. Down time of the machine.
   b. Time to bring back the machine to working condition.
   c. Failure Rate of the machine.
   d. Reliability of the machine.

   **Ans. b. Time to bring the machine to working condition.**

5. PDCA stands for
   a. Plan Do Check Act.
   b. Product Development Check Analysis.
   c. Plan Develop Criticize Action.

d. Product Destructive Check Analysis.

**Ans. a. Plan Do Check Act.**

## Section – B

03X02 = 06 Marks

1. Briefly define Poka-Yoke.

Ans. **Poka-Yoke** is a Japanese term that means "mistake-proofing" or "inadvertent error prevention". It is any mechanism in any process that helps an equipment operator avoid mistakes. Its purpose is to eliminate product defects by preventing, correcting, or drawing attention to human errors they occur. The concept was formalized, and the term adopted, by Shigeo Shingo as part of the Toyota Production System. It was originally described as baka-yoke, but as this means "fool-proofing" (or "idiot-proofing") the name was changed to the milder poka-yoke.

2. What are the key principles of KAIZEN?

Ans. Following are the key principles of KAIZEN:

1. The first is a heavy reliance on **teamwork**, in which everyone's opinion is valued and considered.
2. Workers also have **strong personal discipline**, and morale in factories must improve under kaizen.
3. Workers should also be **confident about offering suggestions** for improvement, even when a system appears to be functioning adequately
4. Kaizen recognizes that there is **always room for improvement**
5. Finally, the system uses **quality circles, worker groups** who meet and work together to solve problems and come up with innovative changes.

3. Define Reliability and Failure Rate.

Ans. Reliability is defined to be the probability that a component or system will perform a required function for a given period of time when used under stated operating conditions.

Failure rate ($\lambda$) = Number of items failed/ Total test hours of all items

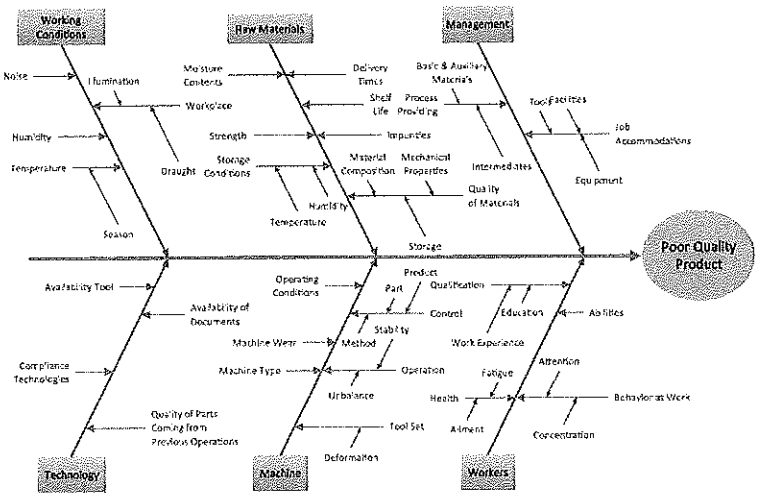
## Section – C

03X03 = 09 Marks

1. What is Fishbone diagram? Explain with a suitable example.

Ans. Dr. Kaoru Ishikawa, a Japanese quality control statistician, invented the fishbone diagram. Therefore, it may be referred to as the Ishikawa diagram. The design of the diagram looks much like the skeleton of a fish. Therefore, it is often referred to as the fishbone diagram. It is also called as cause-and-effect analysis. A cause-and-effect analysis generates and sorts hypotheses about possible causes of problems within a process by asking participants to list all of the possible causes and effects for the identified problem. Cause-and-effect diagrams can reflect either causes that block the way to the desired state or helpful factors needed to reach the desired state.

Fishbone Diagram - Causes of Low-Quality Output




2. What is Quality Circle and who invented it?

Ans. Quality circles are groups of employees who voluntarily meet together on a regular basis to identify, define, analyze and solve work related problems. It is a volunteer group composed of workers (or even students), usually under the leadership of their supervisor (but they can elect a team leader), who are trained to identify, analyze and solve work-related problems and present their solutions to management in order to improve the performance of the organization, and motivate and enrich the work of employees.

It was Dr. ISHIKAWA, japanese quality expert who introduced the quality circle, which stressed the participation of maximum number of people engaged in industry in quality control programs.

3. An amplifier has an exponential time to time failure distribution with a failure rate of 8% per 1000 hours. What is the reliability of the amplifier at 5000 h? Find the MTTF.

Ans.

***Solution*** **The constant failure rate $\lambda$ is obtained as**

$$\lambda = 0.08/1000 \text{ hours} = 0.00008/\text{hour}$$

**The reliability at 5000 hours is**

$$R(t) = e^{-\lambda t} = e^{-(0.00008)(5000)} = e^{-0.4} = 0.6703$$

**The mean time to failure is**

$$\text{MTTF} = 1/\lambda = 1/0.00008 = 12,500 \text{ hours}$$

Registration No.: .....

# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

**School of Automotive Skills**

**5th Semester, 2nd In-Sem. Examination**

**B. Voc. Program, summer Semester (2019-20)**

**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 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. Why we use plastic primer?

a. To increase the adhesion between plastic parts and paint
b. To prevent plastic from degradation
c. To increase the gloss
d. None of these

Q-2. Where we use the flop controller?

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

Q-3. Which chemical is found in Hardener?

a. Isocyanate
b. Butane
c. Xylene
d. None of the above

Q-4. Which type of paint is formulated using 1k binder?

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

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

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

## Section – B

03X02 = 06 Marks

Q-6. What is the difference between H.S tinter and L.S. tinter?

Q-7. Write the steps for color matching?

Q-8. Write the steps for shade formulation?

## Section – C

03X03 = 09 Marks

Q-9. Explain the various masking methods.

Q-10.Make a checklist for spray booth maintenance.

Q-11. Write the process for spot repair using metallic paint.

Registration No.: .....

# BHARTIYA SKILL DEVELOPMENT UNIVERSITY

**School of Automotive Skills**

**5th Semester, 2nd In-Sem. Examination**

**B. Voc. Program, Winter Semester (2019-20)**

**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 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. Why we use plastic primer?

a. To increase the adhesion between plastic parts and paint
b. To prevent plastic from degradation
c. To increase the gloss
d. None of these

**Ans (a)**

Q-2. Where we use the flop controller?

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

**Ans (d)**

Q-3. Which chemical is found in Hardener?

a. Isocyanate
b. Butane
c. Xylene
d. None of the above

**Ans (a)**

Q-4. Which type of paint is formulated using 1k binder?

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

**Ans (d)**

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

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

**Ans (d)**

## Section – B

03X02 = 06 Marks

Q-6. 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 pifmentation of L.S. is very low and generally used for metallic and pearl paints.

Q-7. Write the steps for color matching?

**Ans:-** 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-8. Write the steps for shade formulation?

Ans 1. Select the appropriate shade card.

2. Estimate the amount of paint required.

3 Do the calculation for the required amount of paint,

4. Starts the mixing with binder.

5. Always Do the mixing in series of tinters mentioned in shade card.

## Section – C

03X03 = 09 Marks

Q-9. Explain the various masking methods.

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

- During surfacer application, we uses 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. <u>For Repainting a quarter panel</u>:-**

- 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. <u>For Repainting the end of a fender</u>:-**

- 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-10.Make a checklist for spray booth maintenance.

Q-11. Write the process for spot repair using metallic paint.

**Ans:-**

1. Carefully clean with Prepsol
2. Make sure that the surfacer area is as small as possible.
3. sanding pad using P2000 wet grit paper
4. Blow parts with compressed air, clean with degreaser and wipe with a tack cloth
5. Mix Basecoat as per TDS
6. Apply basecoat:
7. until surfacer (damaged) area is fully covered by overlapping each coat slightly so a "dust zone" remains.
8. 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

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

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

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