BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Automotive Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, 1st Semester,

1st In-Sem. Examination

Course Code: AUT1101 **Time: 1 Hour**

Course Name: Automotive Power Train, Chassis & Suspension **Max. Marks: 20**

Instruction: Attempt all Questions.

Section – A

05X01 = 05 Marks

Q-1. Which of the following is not present in petrol engine?

a. Spark Plug
c. Air filter
b. Fuel Injector
d. Carburetor

Q-2. Which of the following is not an internal combustion engine?

a. Petrol engine
c. Diesel engine
b. 4 Stroke engine
d. Gas turbine

Q-3. In a four stroke engine each cylinder has

a. One valve
c. Two valve
b. Four valve
d. Three valve

Q-4. The opening and closing of a valve is respectively done by

a. A cam and spring
c. A spring and cam
b. Gas pressure and cam
d. Cylinder vacuum and spring

Q-5. The correct flow of power through the drive train is

a. Engine drive shafts, clutch, main shaft, counter shaft, final driven gear, wheels
c. Engine main shaft, counter shaft, clutch, final driven gear, drive shafts, wheels
b. Engine clutch, counter shaft, main shaft, final driven gear, drive shafts, wheels
d. Engine clutch, main shaft, counter shaft, final driven gear, drive shafts, wheels

Section – B

03X02 = 06 Marks

Q-6. Define the term "Automobile".

Q-7. Write the name of major components of IC engine.

Q-8. Draw a labeled diagram of 4WD.

Section – C

03X03 = 09 Marks

Q-9. Explain general service procedures of vehicle.

Q-10. Explain the process of 4-stroke diesel engine with the help of diagram.

Q-11. Describe the responsibility of automotive service technician.

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Answer key

Course Code: AUT1101 **Time: 1 Hour**

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b. Engine clutch, counter shaft, main shaft, final driven gear, drive shafts, wheels
d. Engine clutch, main shaft, counter shaft, final driven gear, drive shafts, wheels

Section – B

03X02 = 06 Marks

Q-6. Define the term "Automobile".

Ans: - An "Automobile" is a self-propelled vehicle driven by an internal combustion engine and is used for transportation of passengers and goods on ground. E.g.: Bus, car, Jeep etc…

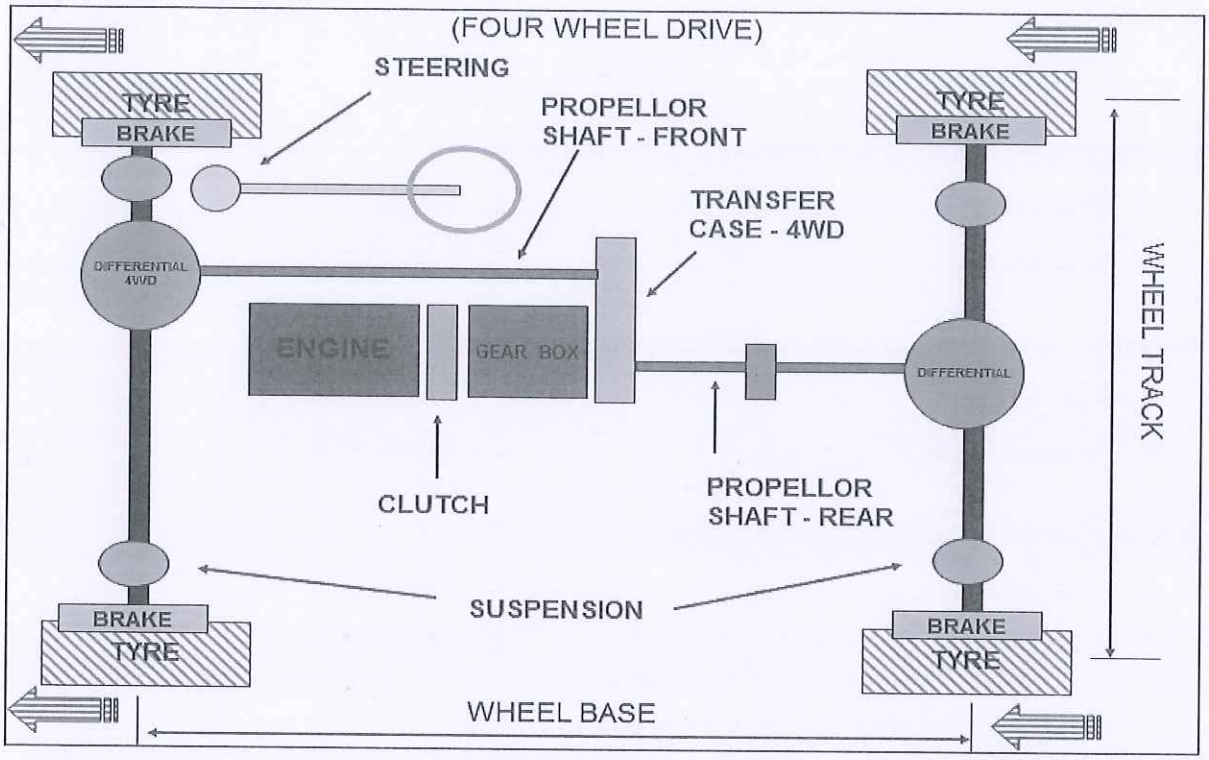
Q-7. Write the name of major components of IC engine.

Ans: - The major components of an IC engine are as follows:

- Cylinder

- Cylinder head
- Piston
- Piston rings
- Gudgeon pin
- Connecting Rod
- Crankshaft
- Crankcase

Q-8. Draw a labeled diagram of 4WD.



Section – C

03X03 = 09 Marks

Q-9. Explain general service procedures of vehicle.

Ans: - The general service includes:

1. Engine oil change
2. Oil filter change
3. Replace the fuel filter
4. Air filter change
5. Check both rear and front brake
6. Check the level of brake and clutch fluid
7. Grease and lubricate components
8. Check the proper operation of all the lights, wiper etc.
9. Check the error code in ECU and take corrective action.

10. Wash the vehicle and clean the interiors.

Q-10. Explain the process of 4-stroke diesel engine with the help of diagram.

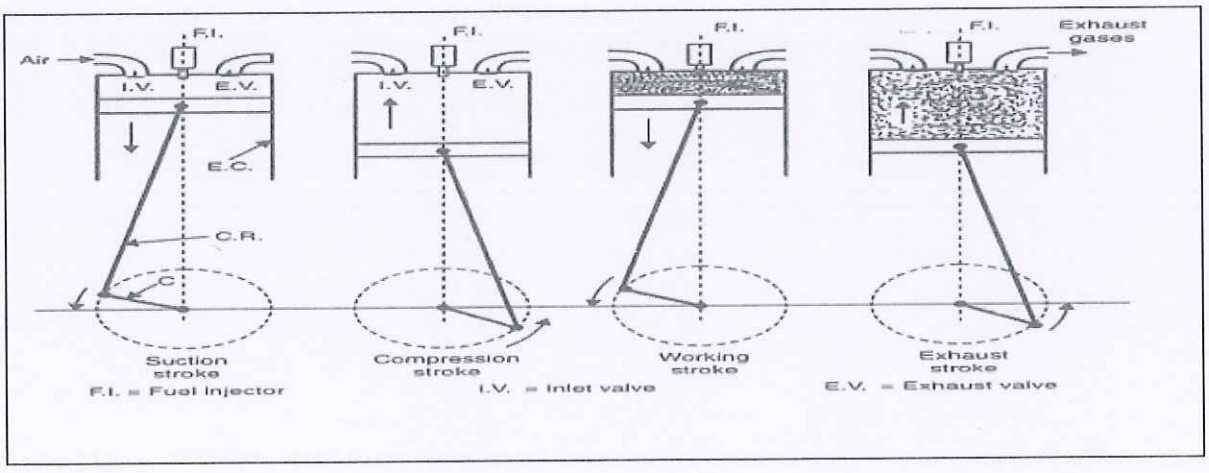
Ans: -

SUCTION STROKE: With the movement of the piston from T.D.C. to B.D.C. during this stroke, the inlet valve opens and the air at atmospheric pressure is drawn inside the engine cylinder; the exhaust valve however remains closed. This operation is represented by the line 5-1

COMPRESSION STROKE: The air drawn at atmospheric pressure during the suction stroke is compressed to high pressure and temperature as the piston moves from B.D.C. to T.D.C. Both the inlet and exhaust valves do not open during any part of this stroke. This operation is represented by 1-2

POWER STROKE OR EXPANSION STROKE: As the piston starts moving from T.D.C to B.D.C, the quantity of fuel is injected into the hot compressed air in fine sprays by the fuel injector and it (fuel) starts burning at constant pressure shown by the line 2-3. At the point 3 fuel supply is cut off. The fuel is injected at the end of compression stroke but in actual practice the ignition of the fuel starts before the end of the compression stroke. The hot gases of the cylinder expand adiabatically to point 4. Thus doing work on the piston.

EXHAUST STROKE: The piston moves from the B.D.C. to T.D.C. and the exhaust gases escape to the atmosphere through the exhaust valve. When the piston reaches the T.D.C. the exhaust valve closes and the cycle is completed. This stroke is represented by the line 1-5.



Q-11. Describe the responsibility of automotive service technician.

Ans:

Automotive service technicians and mechanics typically do the following:

1. Identify mechanical problems, often by using computerized diagnostic equipment.
2. Test parts and systems to ensure that they are working properly.
3. Follow checklists to ensure that all critical parts are examined.

4. Perform basic care and maintenance, including changing oil, checking fluid levels, and rotating tires.
5. Repair or replace worn parts, such as brake pads and wheel bearings.
6. Disassemble and reassemble parts of Automotive Vehicles.
7. Use testing equipment to ensure that repairs and maintenance are effective
8. Explain to clients their automotive problems and the repairs done on their vehicles

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Registration No.: .....

School of Automotive Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, 1st Semester

1st In Sem. Examination

QP

Course Code: AUT1102 **Time: 2 Hours**

Course Name: Automotive Wheel Care and Steering System **Max. Marks: 20**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 5 Questions. Each question carries 1 Marks.
4. Section B contains 3 Questions. Each question carries 2 Marks.
5. Section C contains 3 Questions. Each question carries 3 Marks.

Section – A

05X01 = 05 Marks

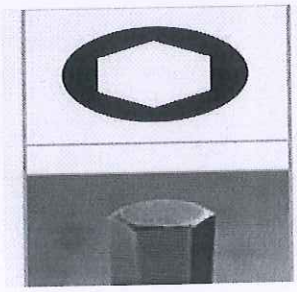
Q1. In wheel alignment which angle we adjust?

a) Caster
b) Camber
c) Toe
d) None of the above

Q2. Name the tool?

a) Combination wrench
b) Allen wrench
c) Open end wrench
d) None of the above

Q3. Name the type of screw driver?

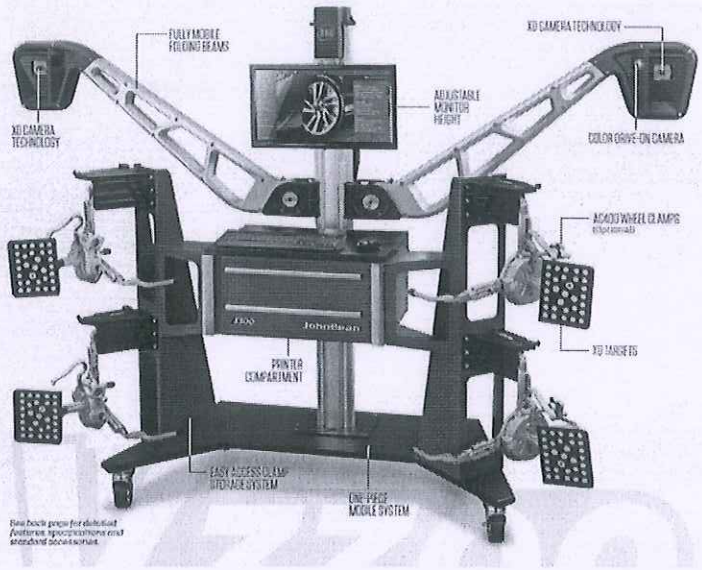


a) Hexagon
b) Slotted
c) Torx
d) Philips

Q4. What 'Sort' represents in 5S technique to create and maintain intuitive workspace?

a) Keep only necessary items on the workspace
b) Put all the items inside
c) Put all the items on the workspace
d) Put them in order

Q5. Name the machine used for



a) Wheel balancing
b) Wheel changer
c) Tyre inflator
d) Wheel alignment

Section – B

03×02 = 06 Marks

Q6. Write difference between tools and equipment's?

Q7. Write short note on wheel alignment

Q8. Write at least four roles of technician in wheel care.

Section – C

03×03 = 09 Marks

Q9. Write three different types of equipment's and their uses

Q10. Write brief note different types of pliers with their uses.

Q11. What is wheel balancer, explain with diagram?

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Automotive Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, 1st Semester

Answer sheet 1st In Sem. Examination

A.K.

Course Code: AUT1102 **Time: 2 Hours**

Course Name: Automotive Wheel Care and Steering System **Max. Marks: 20**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 5 Questions. Each question carries 1 Marks.
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5. Section C contains 3 Questions. Each question carries 3 Marks.

Answer key

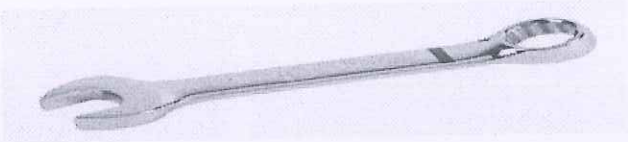
Section – A

05X01 = 05 Marks

Q1. In wheel alignment which angle we adjust?

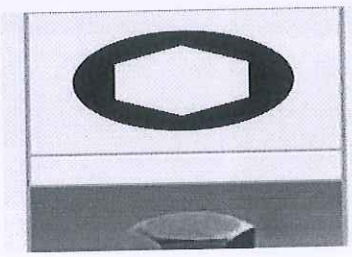
a) Caster
b) Camber
c) Toe
d) None of the above

Q2. Name the tool?



a) Combination wrench
b) Allen wrench
c) Open end wrench
d) None of the above

Q3. Name the type of screw driver?

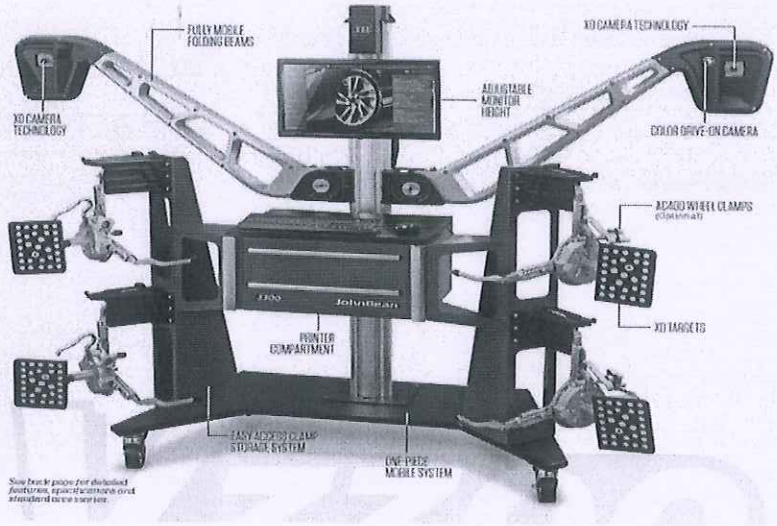


a) **Hexagon**
b) Slotted
c) Torx
d) Philips

Q4. What 'Sort' represent in 5S technique to create and maintain intuitive workspace?

a) **Keep only necessary items on the workspace**
b) Put all the items inside
c) Put all the items on the workspace
d) Put them in order

Q5. Name the machine used for



a) Wheel balancing
b) Wheel changer
c) Tyre inflator
d) **Wheel alignment**

Section – B

03×02 = 06 Marks

Q6. Write difference between tools and equipment's?

Ans.

Sr. No.	Tools	Equipment
1	A tool can be any item that is used to achieve a goal	Equipment usually denotes a set of tools that are used to achieve a specific objective
2	A tool can be non-mechanical	A equipment is a mechanical

3	The usage of tools among human beings runs back to millions of years	The use of equipment is more of a recent development.
4	Tools are often seen to be used by animals	Equipment is only used by human beings.
5	Tools are usually multipurpose.	Equipment is designed for a specific task.

Q7. Write short note on wheel alignment

Ans.

WHEEL ALIGNMENT

Alignment refers to an adjustment of a vehicle's suspension – the system that connects a vehicle to its wheels. It is not an adjustment of the tires or wheels themselves. The key to proper alignment is adjusting the angles of the tires which affects how they make contact with the road.

With caster and camber adjusted, then adjust toe angles. Restart the car, remove the steering **wheel-lock**, turn the steering **wheel** back and forth a couple times, then re-center and replace the steering **wheel-lock**. Recheck **alignment** specifications, and then readjust angles as necessary.

Q8. Write at least four roles of technician in wheel care.

Ans.

ROLE OF TECHNICIAN IN WHEEL CARE

- An automotive service technician (or auto mechanic) is someone who inspects, maintains, repair and replace like tyre brake etc.
- Test parts and systems to ensure they are working properly
- Identify mechanical problems, often by using computerized diagnostic equipment
- Follow checklists to ensure that all critical parts are examined
- Perform basic care of tyre rotations
- Repair or replace worn parts, such as brake pads and wheel bearings
- Disassemble and reassemble parts
- Use testing equipment to ensure that repairs and maintenance are effective
- Explain to clients their automotive problems and the repairs done on their vehicles

(Any four)

Section – C

03×03 = 09 Marks

Q9. Write three different types of equipment's and their uses

Ans. **Tyre changer**

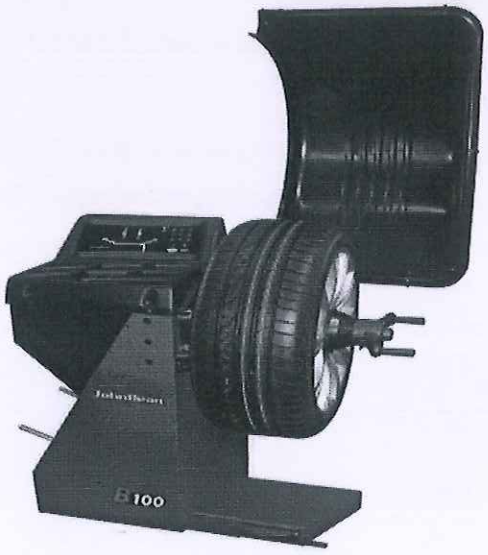
motorcycles and heavy-duty trucks. New tire and wheel technology has improved certain tire changers performance.

- **Tyre Inflator**

An **inflator** or compressor is a high-pressure unit that pushes air out of its hose. Its power typically comes from connecting the compressor to the vehicle's cigarette lighter or battery and its hose is connected to the tyre valve in order for air to enter into the tyre.

- **Wheel Balancer**

Wheel balancing, also known as Tyre balancing, is the process of equalizing the weight of the combined tire and wheel assembly so that it spins smoothly at high speed



Wheel alignment, sometimes referred to as breaking or tracking, is part of standard automobile maintenance that consists of adjusting the angles of wheels so that they are parallel to each other and

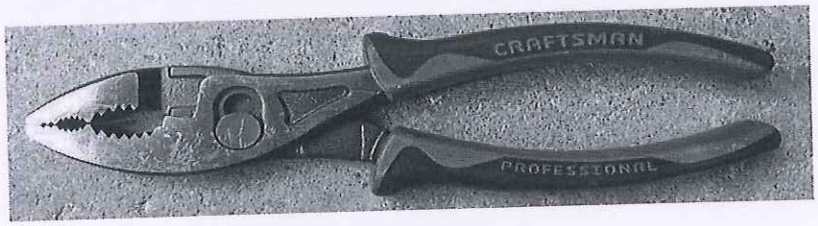
perpendicular to the ground.

(Write any three)

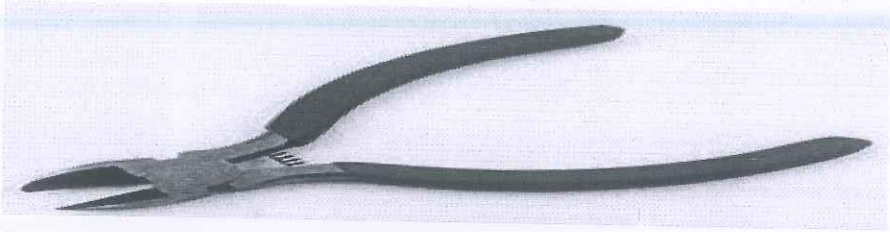
Q10. Write brief note different types of pliers with their uses.
Ans

DIFFERENT TYPES OF PLIER:

1. **Slip joint pliers:** Slip joint pliers are pliers whose pivot point or fulcrum can be moved to increase the size range of their jaws. Most slip joint pliers use a mechanism that allows sliding the pivot point into one of several positions when the pliers are fully opened.

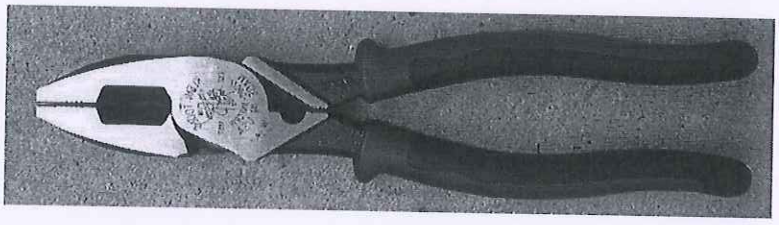


2. **Diagonal pliers or side cutters:** Diagonal pliers (wire cutters) are pliers intended for the cutting of wire (they are generally not used to grab or turn anything). The plane defined by the cutting edges of the jaws intersects the joint rivet at an angle or "on a diagonal ".



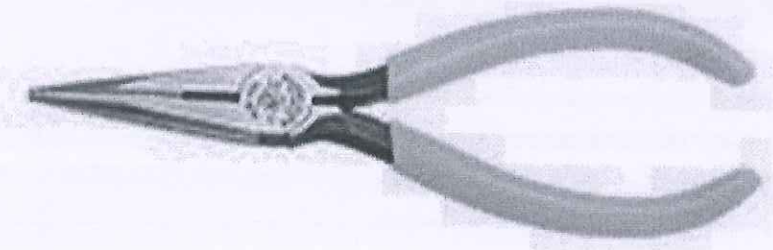
3. **Lineman's pliers or combination pliers:**

Lineman's plier a type of plier used by electricians and other tradesmen primarily for gripping, twisting, bending and cutting wire and cable. Linemen's pliers owe their effectiveness to their plier design, which multiplies force through leverage. Lineman's pliers have a gripping joint at their snub nose and cutting edge in their craw. Some versions include either an additional gripping or crimping device at the crux of the handle side of the pliers' joint. Lineman's pliers typically are machined from forged steel and the two handles precisely joined with a heavy-duty rivet that maintains the pliers' accuracy even after repeated use under extreme force on heavy-gauge wire. Lineman's pliers usually have grips for better handling than bare metal handles; the grips may also provide insulation for protection against electric shock when working with live circuits, although most models are marked as not listed for such use. Some pliers are certified to withstand a specified voltage.



4. **Needle-nose pliers:**

Needle-nose pliers (also known as pointy-nose pliers, long-nose pliers, pinch-nose pliers or snipe-nose pliers) are both cutting and holding pliers used by artisans jewelry designers electricians network engineers and other tradesmen to bend, re-position and snip wire. Their namesake long nose gives excellent control while the cutting edge near the pliers' joint provides "one-tool" convenience. Because of their long shape they are useful for reaching into small areas where cables or other materials have become stuck or unreachable with fingers or other means.



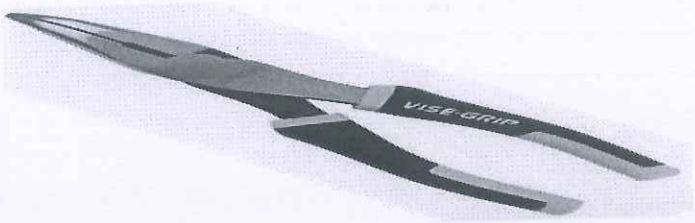
5. **Bent Nose Pliers Features:**

Thin nose profile gets into tight spaces and makes it easy to reach around obstructions

Induction hardened cutting edge stays sharper, longer

Machined jaws for maximum gripping strength

Meets or exceeds ANSI specifications



6. **Pincers:**

Pincers are a hand **tool** used in many situations where a mechanical advantage is required to pinch, cut or pull an object. **Pincers** are first-class levers, but differ from pliers in that the concentration of force is either to a point, or to an edge perpendicular to the length of the **tool**.

7. **Weight Plier:**

These perform several functions such as forming wheel balancing weights, removing & attaching wheel balancing weights from wheel.

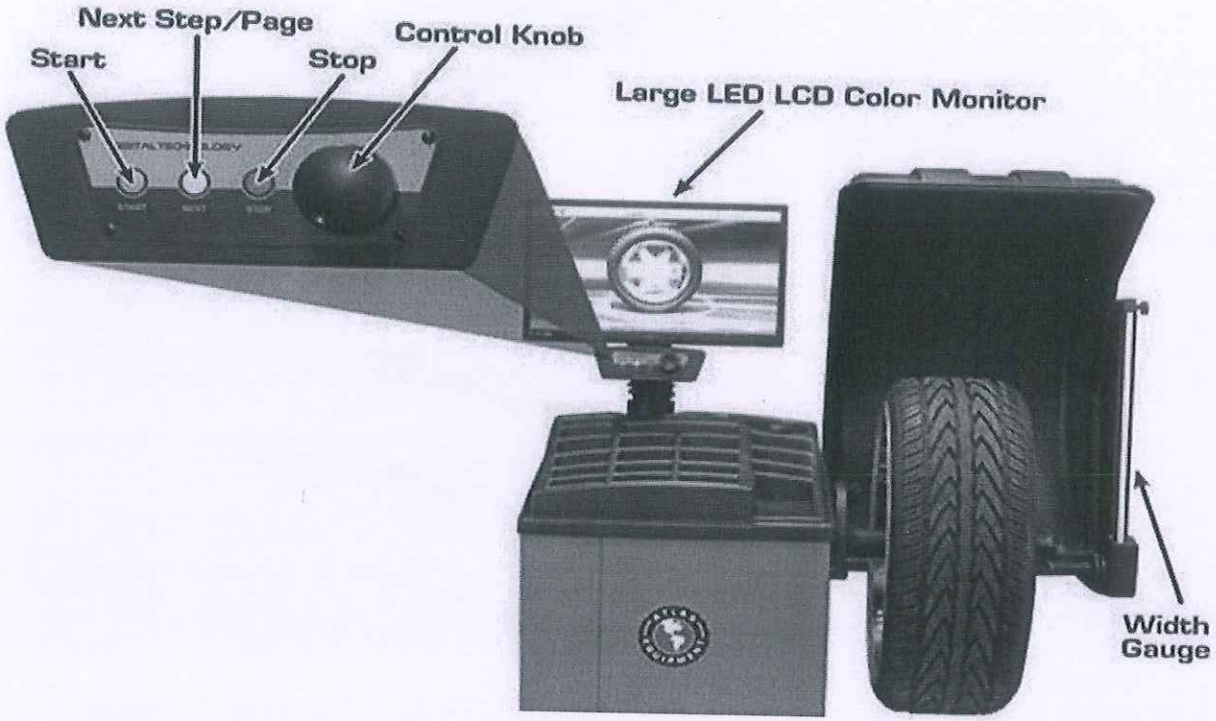
Q11. What is wheel balancer, explain with diagram?

Ans. **WHEEL BALANCER**

Wheel balancing, also known as **Tyre balancing**, is the process of equalizing the weight of the combined tire and wheel assembly.

Wheel balancing is the process of balancing the weight of a tire and wheel assembly so that it travels evenly at high speeds. Balancing requires putting a mounted wheel and tire on a balancer, which

mounted onto a vehicle with a new tire, it has to be balanced. The goal is to make sure the weight is evenly distributed throughout each of the wheels and tires on a vehicle. This process evens out heavy and light spots in a wheel, so that it rotates smoothly. If there is even a slight difference in weight in the wheels, it will cause enough momentum to create a vibration in the car.



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Automotive Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, 1st Semester

1st In Sem. Examination

Course Code: AUT1103 **Time: 2 Hours**

Course Name: Automotive Body Repair **Max. Marks: 20**

Instruction:

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 5 Questions. Each question carries 1 Marks.
4. Section B contains 3 Questions. Each question carries 2 Marks.
5. Section C contains 3 Questions. Each question carries 3 Marks.

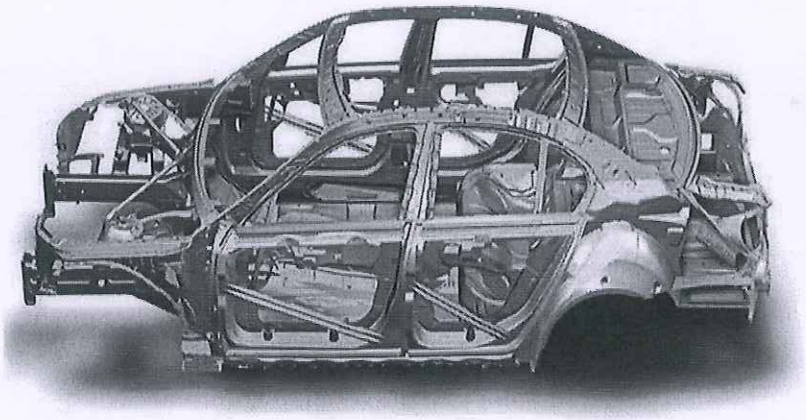
Section – A

05X01 = 05 Marks

Q1. Mid-section of a car body also called

a) Doghouse
b) Cathouse
c) Greenhouse
d) None of the above

Q2. Name the type of chassis.



a) Monocoque
b) Ladder
c) Backbone
d) None of the above

Q3. Name the type of Car Body style?

a) Convertible
b) SUV
c) MUV
d) Van

Q4. How many panels are there in a car body?

a) 13
b) 15
c) 06
d) 12

Q5. What red colour shows in a safety sign?

a) Warning
b) Mandatory
c) Safe condition
d) Prohibition

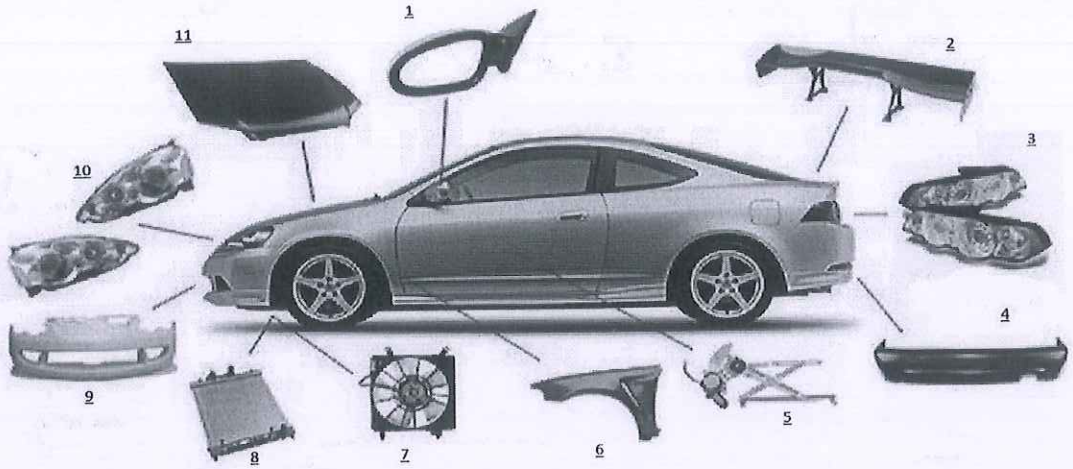
Section – B

03×02 = 06 Marks

Q6. Name tools and equipment's used in automotive body repair

Q7. Write short note Car body pillars

Q8. Name the parts of car body shown in diagram -



Section – C

03×03 = 09 Marks

Q9. Explain 5S technique.

Q10. Specify different types of car bodies with example.

Q11. Write short note on chassis of an automobile and classify them.

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B. Voc. Program, 1st Semester

Answer sheet 1st In Sem. Examination

AK.

Course Code: AUT1103 **Time: 2 Hours**

Course Name: Automotive Body Repair **Max. Marks: 20**

Instruction:

Answer key

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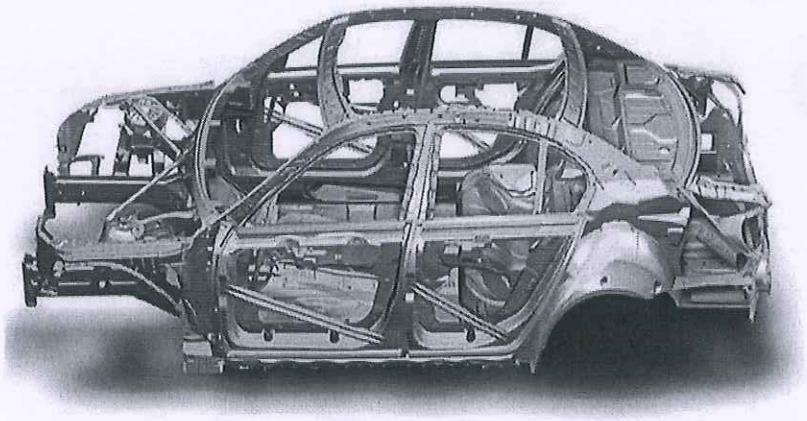
Q2. Name the type of chassis.



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Q4. How many panels are there in a car body?

a) **13**
b) 15
c) 06
d) 12

Q5. What red colour shows in a safety sign?

a) Warning
b) Mandatory
c) Safe condition
d) **Prohibition**

Section – B

03×02 = 06 Marks

Q6. Name tools and equipment's used in automotive body repair

Ans.

The following tools and equipment are used in Body Repair Shop:

- Pneumatic tools
- Dent puller

- Metal-cutting guns
- Plasma cutters
- Heavy-duty hydraulic jacks
- Hammers & Mallet
- Files, pliers, wrenches, and screwdrivers.

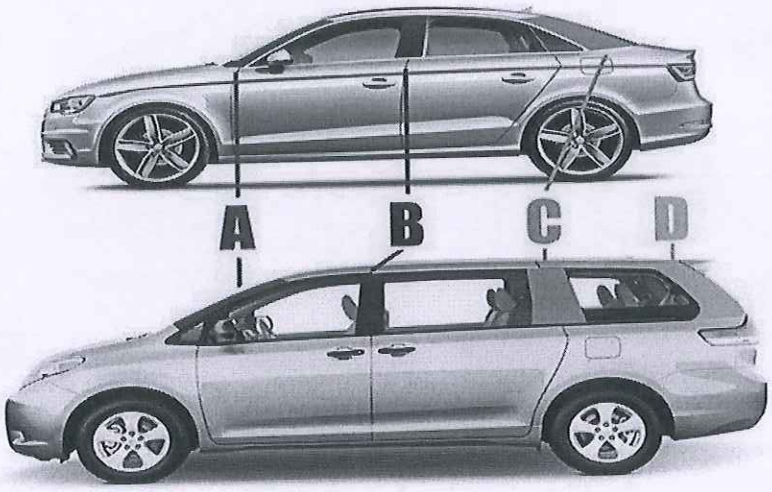
Q7. Write short note Car body pillars

Ans.

Car Body pillar

Just like in civil construction, a car's pillars support its roof. To identify them, one needs to look at the car from one of its sides. The sloping pillar between which the windshield glass is fixed is the A Pillar. The second pillar from the front is the B Pillar, onto which the front doors click shut. The rear doors are hinged to the B Pillar as well. The C Pillar is behind the rear seat, and is the third and final pillar when it comes to hatchbacks, sedans, and small SUV's. Larger cars with a third row of seating, like Minivans and Large SUV's, have a fourth D Pillar, which is behind the third row.

Typically, thicker A and C Pillars (D, in case of Minivans and SUV's) are disliked as they block the driver's field of vision at the front and back respectively.



Q8. Name the parts of car body given in diagram -


1
11
2
10
3
4
9
8
7
6
5

Ans.


Hood
Mirror
Spoiler
Head Lights
Tail Lights
Front Bumper
Rear Bumper
Radiator, A/C condenser
A/C, Radiator Fan
Fender
Window Regulator

Section – C

03×03 = 09 Marks

Q9. Explain 5S technique

Ans.

Q10. Specify different types of car bodies with example.

Ans

Hatchback

A hatchback is a car with a sloping back and a hinged rear door that opens upwards. These cars differ from SUVs, MPVs or vans in that they are usually much more compact. Hatchbacks usually have seating for four-five people is almost always a tight squeeze. An example of a hatchback is the Maruti Suzuki Swift.

Sedan

A sedan, also called a saloon, is a passenger car with a bonnet covering the engine and a separate boot for luggage at the rear. This is one of the most popular body styles of cars today, with seating for at least four people. A sedan design is also known as a 'three-box' design. An example of a sedan is the Honda City.

Coupe

Coupes are often the sporty variants of saloon cars, with doors reduced from 4 to 2. However, the coupe body style varies from carmaker to carmaker, and now there are even four-door coupes like the Mercedes-Benz CLS-Class. The name 'coupe' comes from the French verb 'Couper', which means 'to

Estate

Estates, or station wagons, have a body style similar to a sedan, but with an extended rear luggage or cargo area. These cars have a two-box design with the passenger compartment extending over where the boot would have been in a saloon. They are usually based on sedans and often share the same frontal design. Estates are not very common in India, but an example is the Skoda Octavia Combi.

SUV

An SUV, or Sports Utility Vehicle, is similar to an estate, but usually bigger and higher off the ground. SUVs are often offered with four-wheel-drive and are designed for both on- and off-road use. Some have the towing capacity of a pickup, and offer the passenger carrying capacity of a minivan or large sedan. An example of an SUV is the Ford Endeavour.

MPV

MPVs, or Multi-Purpose Vehicles, feature a one- or two-box design and are taller than station wagons. They often see estate-like interior appointments and are also called people-carriers, people-movers, minivans, or MUVs (Multi-Utility Vehicles). They are designed to be spacious and usually get three rows of seats with seating for 7 or more. An example of an MPV is the Toyota Innova.

Crossover

A crossover is a vehicle built on a car platform but often with features of an SUV like increased ground clearance and a higher seating position. Crossovers are typically designed only for light off-roading. An example of a crossover is the recently-launched Fiat Avventura.

Pickup

A pickup is a light motor vehicle with an open rear cargo area known as a 'bed'. These are extremely popular in the US, and feature factory-built integrated beds. The term also applies to coupe utility vehicles, where they are based on a car chassis or a dedicated platform. Pickups are called 'utes' in Australia and New Zealand. They are often available with two or four doors for the passenger compartment, and are called single-cab pickups and double-cab pickups respectively. An example of a pickup is the Tata Xenon, which features a double-cab design.

Q11. Write short note on chassis of an automobile and classify them.

Ans. **CHASSIS OF AN AUTOMOBILE**

- Chassis frame is the basic frame work of the automobile. It supports all the parts of the automobile attached to it.
- All the parts related to automobile like engine, transmission, steering, suspension, braking system, etc. are attached to it.
- It is made of steel and steel alloy, carbon steel or Aluminum alloy.

Classification of Chassis

Generally, chassis is classified into three types on the basis of frame used. They are:

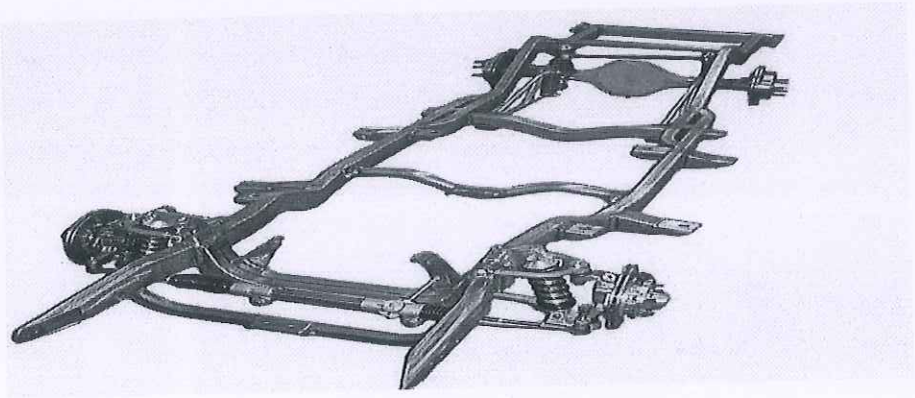
a) Ladder chassis

b) Backbone chassis

c) Monocoque chassis

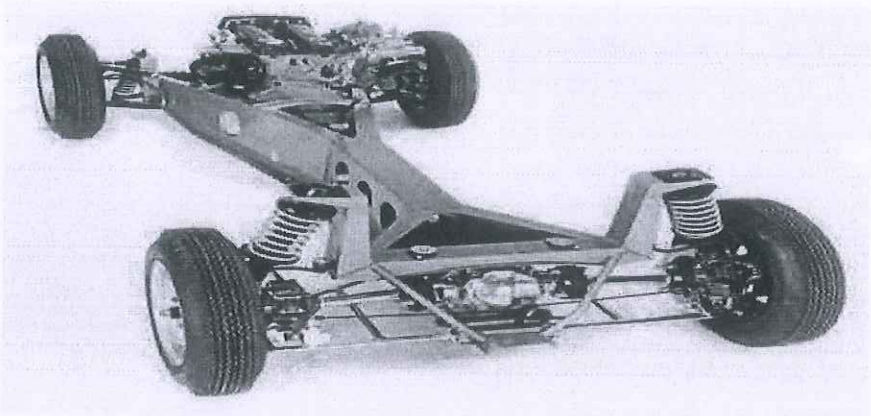
Ladder chassis

- It is one of the oldest forms of automotive chassis that is still used by most of the SUVs till today.
- Ladder chassis resembles a shape of a ladder having two longitudinal rails inter linked by several lateral and cross braces.



Backbone chassis

- This type of automotive chassis is strong and powerful enough to provide support smaller sports car.



Monocoque chassis

- Monocoque Chassis is a one-piece structure that prescribes the overall shape of a vehicle.
- This type of automotive chassis is manufactured by welding floor pan and other pieces together

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School of Automotive Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 1st Semester

1st In-Sem. Examination

Course Code: AUT1104 **Time: 1 Hour**

Course Name: Automotive Refinish Painting **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

5x1=5 Marks

Q-1. The equipment used to purify the breathing air into paint booth is.....

a. Mask & respirator.
b. Ear plug.
c. Hand gloves.
d. None of the above.

Q-2. What is the color code of warning sign?

a. Red.
b. Blue.
c. Yellow.
d. None of the above

Q-3. Which of the following process are part of Automotive refinish painting?

a. Dry sanding.
b. Primer application.
c. Putty application.
d. All of the above.

Q-4. The statement "Smoking is prohibited in the workshop" is a part of...

a. Sort.
b. Set in order.
c. Standardize.
d. Sustain.

Q-5. Out of the following options which one is not a part of PPE?

a. Hand Gloves.
b. Hand Blocks.
c. Dust Mask.
d. Apron.

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Section-B

3x2=6 Marks

Q-6. What are the roles and responsibilities of Automotive paint technician?

Q-7. What can be the potential ignition sources in Automotive paint shop?

Q-8. Write down the list of process of Automotive refinish painting.

Section-C

3x3=9 Marks

Q-9. Explain refinish painting hazards .

Q-10. Explain 5S? Write down the two advantages of each component of 5S?

Q-11. Explain tools and equipment which is used in paint shop.

AK

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School of Automotive Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 1st Semester

1st In-Sem. Examination

Answer key

Course Code: AUT1104 **Time: 1 Hour**

Course Name: Automotive Refinish Painting **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

5x1=5 Marks

Q-1. The equipment used to purify the breathing air into paint booth is.....

a. Mask & respirator.
b. Ear plug.
c. Hand gloves.
d. None of the above.

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c. Dust Mask.
d. Apron.

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Section-B

3x2=6 Marks

Q-6. What are the roles and responsibilities of Automotive paint technician?

Ans:

- To carry all types of vehicle body refinishing work like: -
  1. Pre -paint preparation
  2. Priming and painting
  3. Paint inspection
  4. Rectification of defects
- To identify and utilize the correct methods of working by using your experience, skills, training and industry knowledge,
- To keep your skills up-to-date by making appropriate efforts to acquire adequate knowledge of new vehicles.
- To identify and report all apparent faults considered to be advisable in the interest of safety and reliability.

Q-7. What can be the potential ignition sources in Automotive paint shop?

Ans: **Potential sources of ignition include:**

1. Open flames (work space heating units)
2. Cutting and welding torches
3. Gas fired heaters
4. Electrical outlets and lighting
5. Static electricity
6. Smoking

Q-8. Write down the list of process of Automotive refinish painting.

Ans:

1. Bare metal.
2. Body filler Application.
3. Primer application.
4. Base coat application.
5. Clear coat application.

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Section-C

3x3=9 Marks

Q-9. Explain refinish painting hazards .

Ans Interior Painting Safety Hazards:

- Inadequate ventilation is the first and foremost hazard when painting indoors.
- Take care when placing appropriate warning signs for people place them at a level and in a position where the majority of people can see them easily.

Fire and explosion hazards:

- One of the major safety concerns associated with spray application is the combustible, flammable vapours and mists.
- It is important to ensure that all potential sources of ignition have been removed prior to spraying flammable and combustible products.

Health effects:

- Overexposure to a substance like primer or paint when spraying them means that too much has been breathed in, swallowed or absorbed.
- The possible health effects of overexposure to these products can vary depending on the chemicals they contain.

The main health effects from exposure to these solvents can include:

1. Eye and skin irritation
2. Respiratory tract irritation;
3. Dermatitis/Skin diseases
4. Drowsiness
5. Vomiting.

Q-10. Explain 5S? Write down the two advantages of each component of 5S?

Q-11. Explain tools and equipment which is used in paint shop.

Ans: **Paint booth**

• Paint booths are walled structures used to safely contain painting and other finishing processes.

• Paint booths are present in a variety of industries including automotive, aviation, manufacturing, millworks, and many more.

In general, there are two types of paint booths:

• Non-ducted (open face)

• Directly ducted (enclosed)

2. **Paint mixing room:**

• Paint mixing room is a place where we mix the paints according to the requirements.

• It should have colour-corrected artificial lighting and downdraft ventilation.

• Paint mix rooms are generally located next to the spray booth to maximise painter productivity.

3. **Spray guns:**

• The spray gun is the most popular type of spray application equipment use • A spray gun is a tool which uses compressed air to atomise paint and to apply it to a surface. • Air and material enter the gun through separate passages and are mixed at the air cap in a controlled pattern.

1. Air nozzle assembly
2. Gravity feed cup
3. Gun body
4. Side port control
5. Fluid control knob
6. Air connection

4. **Air compressor:**

• An air compressor is a device that stores energy in the form of compressed air.

• It converted compressed air back to mechanical energy when using air tools.

• In its basic form, an air compressor has a storage tank, a motor, and pump.

5. **Infrared dryer:**

What is infrared? • It is a radiant energy/ electromagnetic radiation like X-rays and UV rays. It is divided into three parts: -

1. Short wave: - less than 2 microns.
2. Medium wave: - between 2 and 4 microns.
3. Long wave: - above 4 microns.

6. **Dry film thickness meter:**

• It is a coating thickness gauge used to measure dry film thickness.

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

Session 2020-21, Winter Semester

B. Voc. Program, 1st Semester,

1st In-Sem. Examination

Course Code: AUT1105 **Time: 1 Hour**

Course Name: Automotive Electrical Fundamental & A.C.

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.

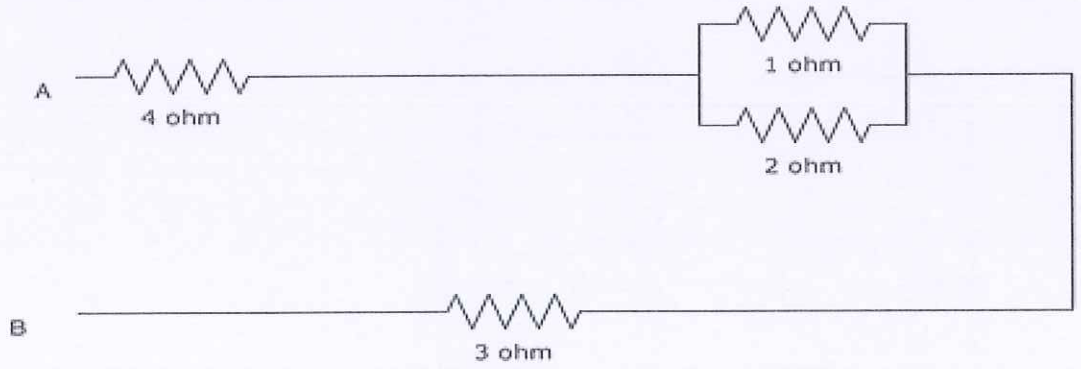
Section – A

05x01 = 05 Marks

Q 1. Which measuring instrument is commonly used in the automotive workshops for auto-electrical measurements?

A. Voltmeter
C. Ammeter
B. Ohm meter
D. Multimeter.

Q 2. Calculate the total resistance between the points A and B.



A. 7 ohms.
C. 7.67 ohms.
B. 0 ohms.
D. 0.48 ohms.

Q 3. Batteries are generally connected in _____.

A. Series.
B. Parallel.
C. Either series or parallel.
D. Neither series nor parallel.

Q 4. In a _____ circuit, the total resistance is smaller than the smallest resistance in the circuit.?

A. Series.
B. Parallel.
C. Either series or parallel.
D. Neither series nor parallel.

Q 5. What is the relationship between resistance and length of wires?

A. If length decreases than Square of resistance increases.
B. If length decreases than resistance increases.
C. If length increases than resistance increases.
D. None of the above

Section – B

03X02 = 06 Marks

Q 6. What do you mean by Ohm's law? Also draw the Ohm's Law Pie Chart.

Q 7. Differentiate between conductors and insulators.

Q 8. What do you understand by capacitors? Name any four applications of capacitors in an automotive electrical.

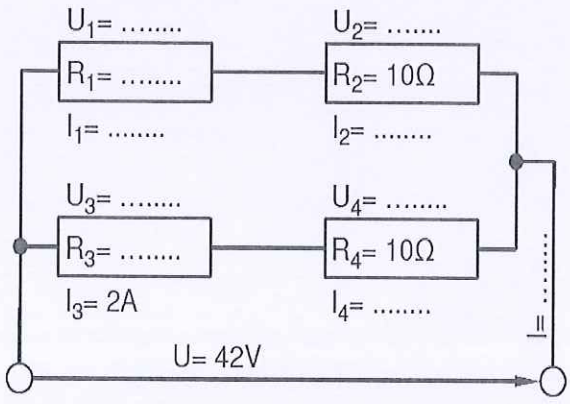
Section – C

03X03 = 09 Marks

Q 9. Explain the followings:

a) Wires.
b) Fuses.
c) Relays.

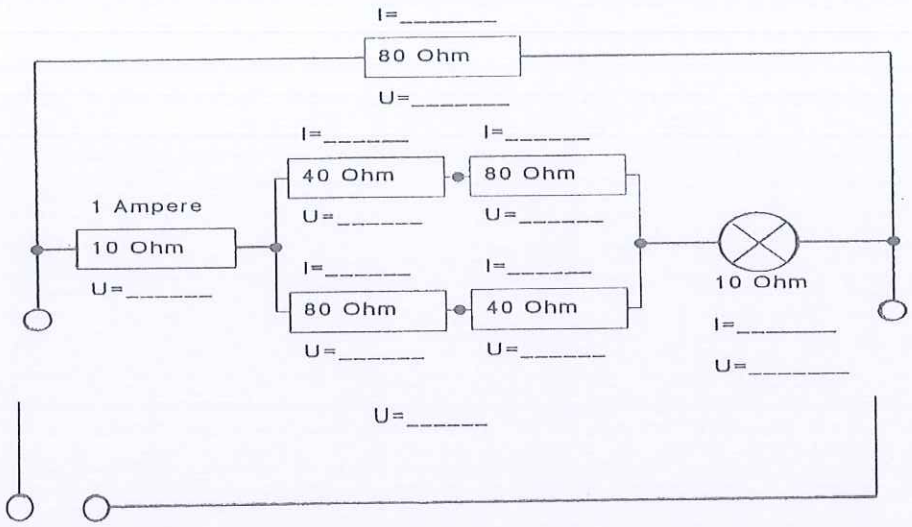
Q 10. Find out the missing units in the electrical circuit:



Q 11.

a) One cable is damaged on the insulation. A residual current of 0.5mA flows at a voltage of 28V. What is the resistance at the damaged area?

b) Draw and calculate the missing units of the given circuit:



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

Session 2020-21, Winter Semester

B. Voc. Program, 1st Semester,

1st In-Sem. Examination

Answer key

Course Code: AUT1105

Course Name: Automotive Electrical Fundamental & A.C.

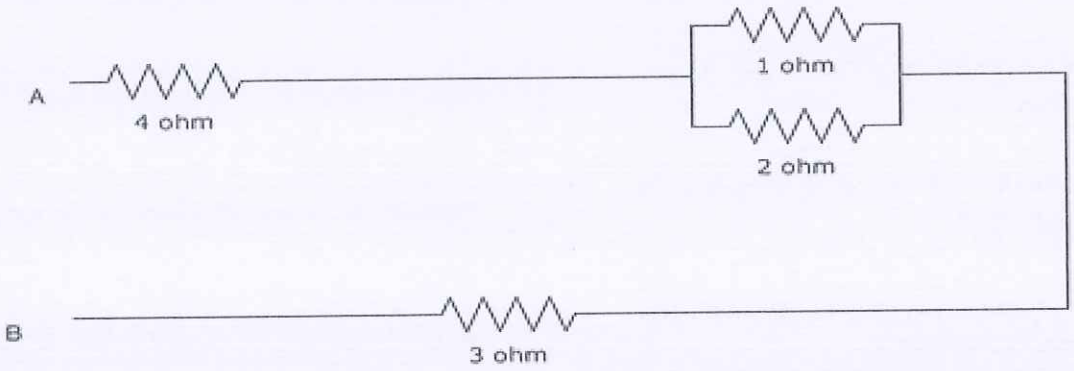
Section – A

05x01 = 05 Marks

Q 1. Which measuring instrument is commonly used in the automotive workshops for auto-electrical measurements?

Answer: D. Multimeter.

Q 2. Calculate the total resistance between the points A and B.



Answer: **C.**7.67 ohms.

Q 3. Batteries are generally connected in _____.

Answer: **C.**Either series or parallel.

Q 4. In a _____ circuit, the total resistance is smaller than the smallest resistance in the circuit.?

Answer: **C.** Either series or parallel.

Q 5. What is the relationship between resistance and length of wires?

Answer: B. If length decreases than resistance increases.

Section – B

03X02 = 06 Marks

Q 6. What do you mean by Ohm's law? Also describe the dependency of the resistance on physical parameters.

Ans. Ohms law state that potential difference applied across any resistance wire is directly proportional to the current flowing through it.

Resistance shows the resistivity which depends on temperature and nature of material.

Resistance directly proportional to length and inversely proportional to cross sectional area.

Q 7. Differentiate between conductors and insulators.

Answer:

Difference between conductors and insulators

Conductors	Insulators
• A conductor allows current to flow through it.	• Insulators don't allow current to flow through it.
• Electric charge exists on the surface of conductors.	• Electric charges are absent in insulator.
• Conductor don't store energy when kept in a magnetic field.	• Insulators store energy when kept in a magnetic field.
• Thermal conductivity (heat allowance) of a conductor is very high.	• Thermal conductivity of an insulator is very low.
• The resistance of a conductor is very low.	• The resistance of insulator is very high.
• Copper, Aluminium, and Mercury are some conductors.	• Wood, paper and ceramic are some insulators.
• Conductors are used in making electrical equipment.	• Insulators are used in insulating electrical equipment for safety purpose.

Q 8. What do you understand by capacitors? Name any four applications of capacitors in an automotive electrical.

Answer: A capacitor is a device that stores electrical energy in an electric field. It is a passive electronic component with two terminals.

Application of capacitors:

- Energy storage.

- Digital memory.
- Pulsed power and weapons.
- Power conditioning.
- Power factor correction.
- Suppression and coupling.
- Signal coupling.
- Decoupling.
- High-pass and low-pass filters.
- Noise suppression, spikes, and snubbers.
- Motor starters.
- Signal processing.
- Tuned circuits.
- Sensing.
- Oscillators.
- Producing light.

Section – C

03X03 = 09 Marks

Q 9. Explain the followings:

a) Wires.
b) Fuses.
c) Relays.

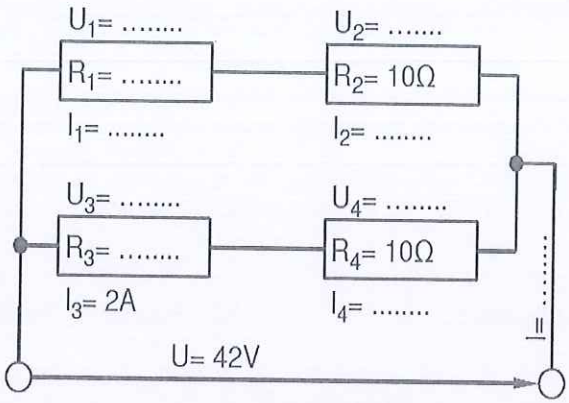
Answer:

a) **Wires:** A wire is a single, usually cylindrical, flexible strand or rod of metal. Wires are used to bear mechanical loads or electricity and telecommunications signals. Wire is commonly formed by drawing the metal through a hole in a die or draw plate. Wire gauges come in various standard sizes, as expressed in terms of a gauge number. The term wire is also used more loosely to refer to a bundle of such strands, as in "multistranded wire", which is more correctly termed a wire rope in mechanics, or a cable in electricity.

b) **Fuses:** In electronics and electrical engineering, a fuse is an electrical safety device that operates to provide overcurrent protection of an electrical circuit. Its essential component is a metal wire or strip that melts when too much current flows through it, thereby interrupting the current. It is a sacrificial device; once a fuse has operated it is an open circuit, and it must be replaced or rewired, depending on type.

c) **Relays:** Relays are switches that open and close circuits electromechanically or electronically. Relays control one electrical circuit by opening and closing contacts in another circuit. As relay diagrams show, when a relay contact is normally open (NO), there is an open contact when the relay is not energized. When a relay contact is Normally Closed (NC), there is a closed contact when the relay is not energized. In either case, applying electrical current to the contacts will change their state.

Q 10. Find out the missing units in the electrical circuit:



Answer:

U1 = 22V
U2 = 20V
U3 = 22V
U4 = 20V

R1 = 11Ω
R3 = 11 Ω
I1 = 2A
I2 = 2A

I4 = 2A
I = 4A.

Q 11.

a) One cable is damaged on the insulation. A residual current of 0.5mA flows at a voltage of 28V. What is the resistance at the damaged area?

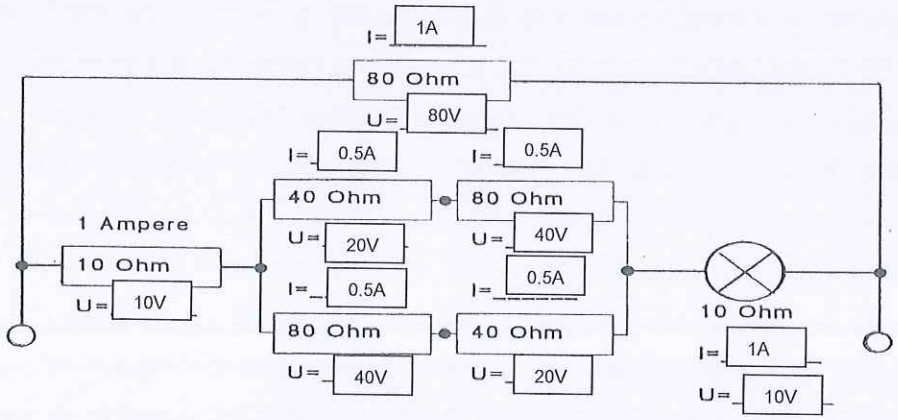
Answer:

I = 0.5 mA; V = 28V; R = ?

w.k.t. V = I.R

So, $R = V/I = 28/0.5X10^{-3} = \mathbf{56k\Omega}$

b) Draw and calculate the missing units of the given circuit:



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Automotive Skills

Session: 2020-21 (Winter Semester)

B. Voc. Program, 1st Semester,

1st In-Sem. Examination

Course Code: AUT1106 **Time: 1 Hour**

Course Name: Automotive tools and measurement **Max. Marks: 20**

Instruction: (If any)

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 05 Questions. Each question carries 1 Marks.
4. Section B contains 03 Questions. Each question carries 2 Marks.
5. Section C contains 03 Questions. Each question carries 3 Marks.

Section – A

05X01 = 05 Marks

Q1. To fit Exactly a spanner must be:

a) Of correct size
b) Placed correctly on nut
c) In good condition
d) All of the above

Q2. Which is not a types of Wrenches:

a) Still Son Pipe Wrench
b) Footprint Pipe Wrench
c) Tension Wrench
d) Socket Spanners

Q3. The least count defines the.....

a) Smallest unit we can measure
b) Smallest dimension
c) Smallest length
d) None of these

Q4. Which is not a part of vice:

a) Fixed jaw
b) Movable jaw
c) Hard jaw
d) Hacksaw

Q5. Which of the following ratios represents the reducing scale?

a) 1:1
b) 2:1
c) 1:2
d) 10:2

Section – B

03X02 = 06 Marks

Q6. Differentiate between first angle and third angle projection?

Q7. Name the different types of vices used to hold the work-piece.

Q8. Write short note on spanners.

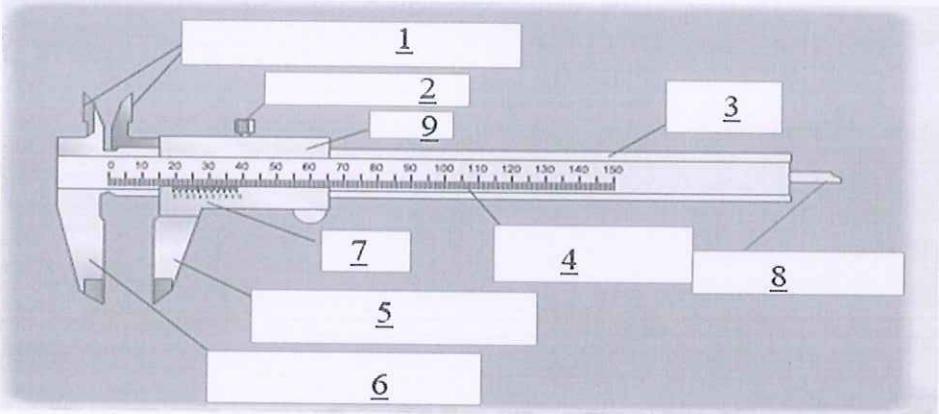
Section – C

03X03 = 09 Marks

Q9. What is scaling? Explain types of scaling.

Q10. Write down the points to be remembered for using spanners in safe way.

Q11. Name the different parts of the following measuring instrument:



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Automotive Skills

Session: 2020-21 (Summer Semester)

A.K.

B. Voc. Program, 1st Semester,

1st In-Sem. Examination

Course Code: AUT1106 **Time: 1 Hour**

Course Name: Automotive tools and measurement **Max. Marks: 20**

Instruction: (if any)

Answer key

1. Attempt all questions.
2. Use of Calculators is prohibited.
3. Section A contains 05 Questions. Each question carries 1 Marks.
4. Section B contains 03 Questions. Each question carries 2 Marks.
5. Section C contains 03 Questions. Each question carries 3 Marks.

Section – A

05X01 = 05 Marks

Q1. To fit Exactly a spanner must be:

a) Of correct size
b) Placed correctly on nut
c) In good condition
d) All of the above

Ans. D

Q2. Which is not a types of Wrenches:

a) Still Son Pipe Wrench
b) Footprint Pipe Wrench
c) Tension Wrench
d) Socket Spanners

Ans. D

Q3. The least count defines the……..

a) Smallest unit we can measure
b) Smallest dimension
c) Smallest length
d) None of these

Ans. A

Q4. Which is not a part of vice:

a) Fixed jaw
b) Movable jaw
c) Hard jaw
d) Hacksaw

Ans. D

Q5. Which of the following ratios represents the reducing scale?

a) 1:1
b) 2:1
c) 1:2
d) 10:2

Ans. C

Section – B

03X02 = 06 Marks

Q6. Differentiate between first angle and third angle projection?

Ans.

First angle projection	Third-angle projection
Object is kept in the first quadrant.	Object is assumed to be kept in the third quadrant.
Object lies between observer and the plane of projection.	Plane of projection lies between the observer and the object.
The plane of projection is assumed to be non-transparent.	The plane of projection is assumed to be transparent.
Front (elevation) view is drawn above the XY line	Front (elevation) view is drawn below the XY line
Top (plan) view is drawn below the XY line	Top (plan) view is drawn above the XY line
Left view is projected on the right plane and vice versa	Left view is projected on the left plane itself.
Followed in India, European countries	Followed in USA

Q7. Name the different types of vices used to hold the work-piece.

Ans.

- Quick releasing vice
- Pipe vice
- Hand vice
- Pin vice
- Tool-maker's vice

Q8. Write short note on spanners.

- Ans. Spanners are used for operating:
  - Threaded Fasteners
  - Bolts
  - Nuts

Spanners are made with jaws or opening that fit square or hexagonal nuts and bolts and screw heads.

Section – C

03X03 = 09 Marks

Q9. What is scaling? Explain types of scaling.

Ans. Some objects can be drawn to their actual size. The proportion by which the **drawing** of aan object is enlarged or reduced is called the **scale** of the **drawing**. Definition. A **scale** is defined as the ratio of the linear dimensions of the object as represented in a **drawing** to the actual dimensions of the same.

Types

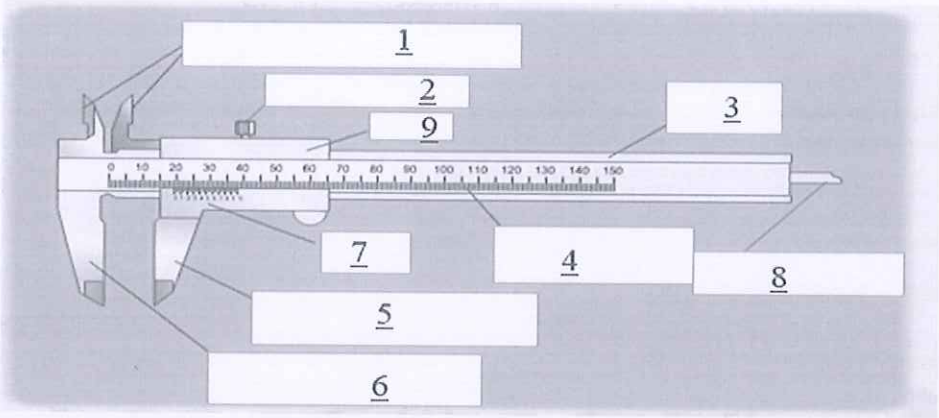
Reducing scaling

Enlarge scaling

Q10. Write down the points to be remembered for using spanners in safe way.

- Ans. Use open end and ring spanners by pulling on the shank it is safest to pull as there is less chance of hitting you if spanner nut slips suddenly.
- If you are forced to push spanner use base of your hand and keep your hand open
- Use both hands for large spanners
- Keep yourself balanced and firm to avoid slipping yourself if spanner slips suddenly
- Use both hands when using tubular box spanner
- Use two spanners to stop head of bolt rotating as the nut is operated
- Socket spanner may be turned by accessories which have square driving ends

Q11. Name the different parts of the following measuring instrument:



Ans.

1. Internal jaw
2. Retaining screw
3. Main scale
4. Main scale in mm
5. Movable jaw
6. Fix jaw
7. Vernier scale
8. Depth stick