Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

1st Semester, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

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

Course Name: Automotive Power Train, Chassis & Suspension

Max. Marks: 20

Instructions:

1. Answer all questions from **"Section-A"**, each question carries 01 mark.
2. Answer all questions from **"Section-B"**, each question carries 02 marks.
3. Answer all questions from "**Section-C**", each question carries 03 marks.

Section – A

Directions: Select any one correct answer from the given options: 05X01 = 05 Marks

1) The inside diameter of cylinder is called .....
   a) Stroke
   b) Radius
   c) Bore
   d) All of the above
2) When piston is at the top, the volume contained in the cylinder above the top of the piston is called.....
   a) Swept volume
   b) Clearance volume
   c) Total cylinder volume
   d) None of these
3) ..... is ratio of total cylinder volume to clearance Volume.
   a) Compression ratio
   b) Air fuel ratio
   c) Gear ratio
   d) Volume ratio
4) Which of the following is not present in petrol engine?
   a) Spark plug
   b) Fuel injector
   c) Carburetor
   d) Air filter
5) Which of the following is not an internal combustion engine?
   a) Petrol engine
   b) Diesel engine
   c) 4 stroke engine
   d) Gas turbine

Section – B

03X02 = 06 Marks

6) Define the term "Automobile".
7) List the major components of IC engine.
8) Draw a labelled diagram of 4WD.

Section – C

03X03 = 09 Marks

9) Discuss general service procedures of a vehicle.
10) Describe the working of an Otto Cycle with the help of P-V diagram.
11) Explain the process of 4-stroke diesel engine with the help of a diagram.

Registration No.: .....

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Solution Paper

School of Automotive Skills

1st Semester, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

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

Course Name: Automotive Power Train, Chassis & Suspension

Max. Marks: 20

Instruction: Attempt all questions.

Section – A

Directions: Select any one correct answer from the given options: 05X01 = 05 Marks

1) The inside diameter of cylinder is called as.....

a) Stroke
b) Radius
c) Bore
d) All of the above

Ans: c)

2) When piston is at the top, the volume contained in the cylinder above the top of the piston is called.....

a) Swept volume
b) Clearance volume
c) Total cylinder volume
d) None of these

Ans: b)

3) ..... is ratio of total cylinder volume to clearance Volume.

a) Compression ratio
b) Air fuel ratio
c) Gear ratio
d) Volume ratio

Ans: a)

4) Which of the following is not present in petrol engine?

a) Spark plug
b) Fuel injector
c) Carburetor
d) Air filter

Ans: b)

5) Which of the following is not an internal combustion engine?

a) Petrol engine
b) Diesel engine
c) 4 stroke engine
d) Gas turbine

Ans: d)

Section – B

03X02 = 06 Marks

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...

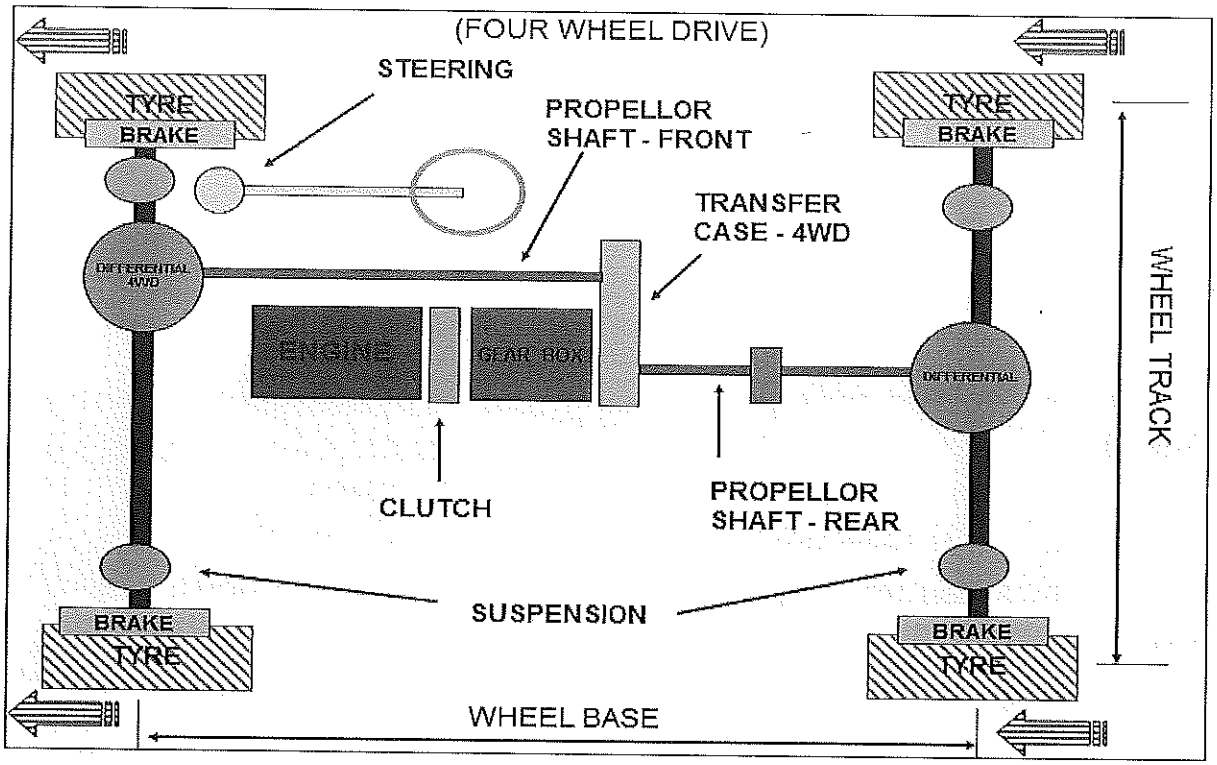
7) List out the major components of IC engine.

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

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

8) Draw a labeled diagram of 4WD.

Ans: -



Section – C

03X03 = 09 Marks

9) Discuss the general service procedures of vehicle.

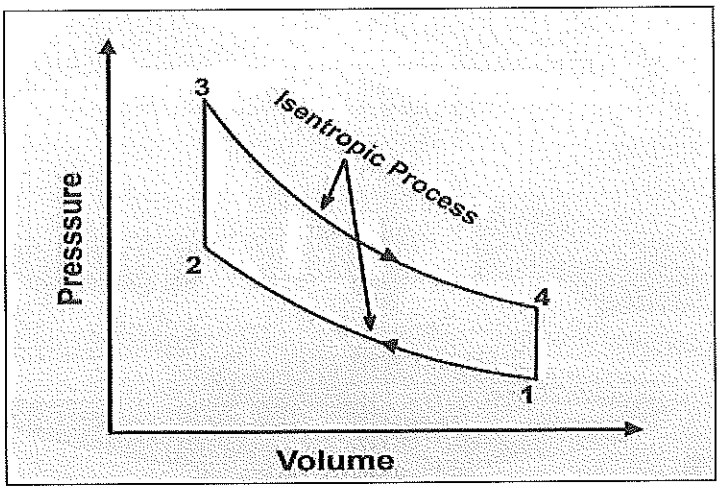
Ans: - The general service includes:

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.

10) Describe the working of an Otto Cycle with the help of P-V diagram.

Ans: -

- Process 1-2: Reversible adiabatic compression of air.
- Process 2-3: Heat addition at constant volume.
- Process 3-4: Reversible adiabatic expansion of air.
- Process 4-1: Heat rejection at constant volume.



11) 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.

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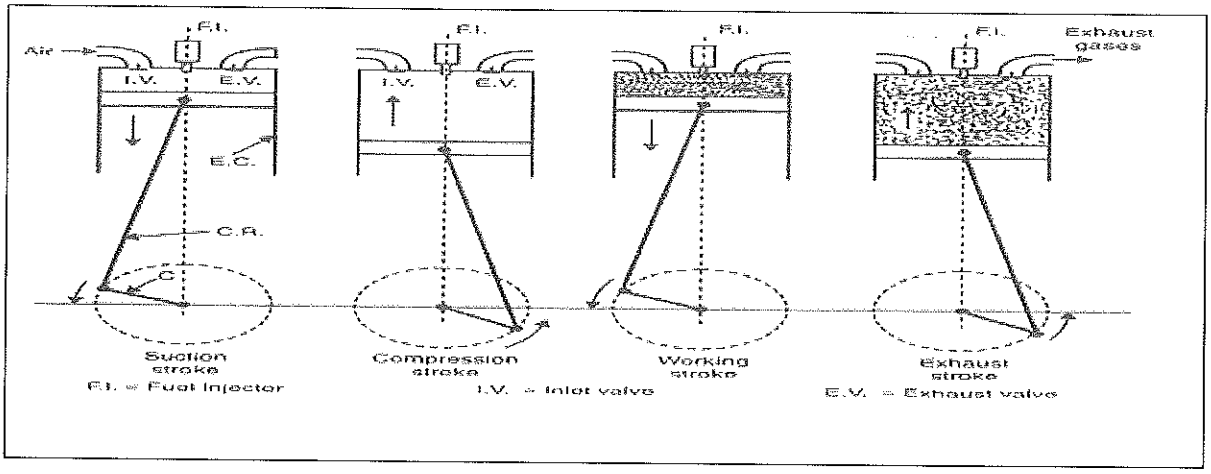

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Question Paper

School of Automotive Skills

1st Semester, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

Course Code: AUT1102 **Time: 1 Hour**

Course Name: Automotive Wheel Care and Steering 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. The purpose of wheel axle in a vehicle is:

A. To cool the engine.

B. To give power on fly-wheel.

C. To give structural support to wheels.

D. For air intake.

Q 2. What is Gerotor?

A. Negative displacement pump.

B. Positive displacement pump.

C. All of the above.

D. None of the above.

Q 3. Which component of an electric steering system differs from a hydraulic steering system?

A. Steering shaft.

B. Universal joint.

C. Rubber bush.

D. Reduction gear.

Q 4. Which material is used in manufacturing of wheel rims?

A. Plastic.

B. Fiber.

C. Pressed steel disc.

D. Copper.

Q 5. The hand tool required to pinch, cut or pull an object is known as:

A. Weight plier.
B. Pincers.
C. Needle-nose plier.
D. Lineman's plier.

Section – B

03X02 = 06 Marks

Q 6. What are the roles and responsibilities of a wheel care technician in an automotive workshop?

Q 7. Write four differences between tools and equipment used in automotive wheel care section.

Q 8. Define steering system of an automobile and also write down their types.

Section – C

03X03 = 09 Marks

Q 9. Explain the following equipment:

a) Wheel Balancer.
b) Tyre Changer.
c) Wheel Aligner.

Q 10. Explain any six tools used in wheel care section with their applications.

Q 11. Describe the components of a steering system with their functions.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills
1st Semester, 1st In-Sem. Examination
B. Voc. Program, Summer Semester (2018-19)

Course Code: AUT1102
Course Name: Automotive Wheel Care

Time: 1 hour
Max. Marks: 20

Section – A

Q 1. The purpose of wheel axle in a vehicle is:
Answer – C. To give structural support to wheels.

Q 2. What is Gerotor?
Answer – B. Positive displacement pump.

Q 3. Which component of an electric steering system differs from a hydraulic steering system?
Answer – D. Reduction gear.

Q 4. Which material is used in manufacturing of wheel rims?
Answer – C. Pressed steel disc.

Q 5. The hand tool required to pinch, cut or pull an object is known as:
Answer – B. Pincers.

Section – B

Q 6. What are the roles and responsibilities of a wheel care technician in an automotive workshop?
Answer – **Roles and responsibilities of technician in wheel care**

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

Q 7. Write four differences between tools and equipment used in automotive wheel care section.
Answer –

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 device	A equipment is a mechanical device
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.

Q 8. Define a steering system of an automobile and also write down their types?
Answer – Steering is the collection of components, linkages, etc. which allows any vehicle to follow the desired course. The primary purpose of the steering system is to allow the driver to guide the vehicle.

Types of steering system:

1. Hydraulic steering system.
2. Electric steering system.

Section – C

Q 9. Explain the following equipment:
a) Wheel Balancer.
b) Tyre Changer.
c) Wheel Aligner.

Answer a)–

Wheel Balancer

1. Wheel balancing, also known as Tyre balancing, is the process of equalizing the weight of the combined tire and wheel assembly.
2. Wheel balancing is the process of balancing the weight of a tire and wheel assembly so that it travels evenly at high speeds.
3. Balancing requires putting a mounted wheel and tire on a balancer, which centers the wheel and spins it to determine where the weights should go.
4. Every time a wheel is first mounted onto a vehicle with a new tire, it has to be balanced.
5. 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.
6. If there is even a slight difference in weight in the wheels, it will cause enough momentum to create a vibration in the car.

Answer b)-

Tyre Changer

1. Tyre changer is a machine which is used to change or replace the tyre.
2. Tyre changer is a machine used to help technicians dismount and mount tires with automobile wheels.
3. Different tire changers allow technicians to replace tires on automobiles, motorcycles and heavy-duty trucks.
4. New tire and wheel technology has improved certain tire changers performance.

Answer c)-

Wheel Aligner

1. 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.
2. The key to proper alignment is adjusting the angles of the tires which affects how they make contact with the road.
3. 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.

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Q 10. Explain any six tools used in wheel care section with their applications.
Answer –

1. **Open-end wrench:** This one-piece wrench is made double-ended with differing size openings for opposite faces of bolts or nuts. The U-shaped opening on each end provides grip for objects by flipping the wrench over to use the opposite side.
2. **Combination wrench:** The combination wrench is a multi-purpose tool with the open-end for tightening and loosening in small spaces and the box-end for leverage and a firm grip around nuts and bolts.
3. **Allen wrench:** These wrenches have L or T-shaped handles with hexagonal shaped ends matching openings to bolts or screws. Though they are small, they are typically used for pairing and holding objects together.
4. **Socket wrench:** Used to turn a fastener, a socket wrench has a socket (hollow cylinder) attached to the end of the handle that is fitted over nuts and bolts to tighten and loosen at many angle.
5. **Adjustable wrench:** If you don't have the right size of wrench for a project or repair, an adjustable wrench can save the day. Also known as a crescent wrench. It should only be used when necessary. Due to their versatility, they can tend to slip and slide along bolts when too much force is used.
6. **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.

Q 11. Describe the components of a steering system with their functions.
Answer –

1. **Steering Wheel -** Steering wheels are used in most modern vehicles like buses, light and heavy trucks, and tractors. The steering wheel is the part of the steering system that is manipulated by the driver the rest of the steering system responds to such driver inputs.

2. **Steering Column -** The automotive steering column is a device intended primarily for connecting the steering wheel to the steering mechanism or transferring the driver's input torque from the steering wheel.

3. **Universal Joint –**

    a. In most cars with an intermediate steering shaft, there are two U-Joint couplings.

    b. The top U-Joint connects the intermediate shaft to the steering column.

    c. The lower U-Joint connects the intermediate shaft to the steering rack.

4. **Steering Gear Box -** The steering gearbox contains the gears that transmit the driver's steering inputs to the steering linkage that turns the wheels, and it multiplies the driver's steering changes so that the front wheels move more than the steering wheel.

5. **Steering Pump -** The hydraulic power for the steering is provided by a rotary-vane pump. This pump is driven by the car's engine via a belt and pulley. It contains a set of retractable vanes that spin inside an oval chamber.

6. **Oil Reservoir -** The oil reservoir sends the oil to the power steering pump and receives the oil from the power steering gear.

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BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

I Semester, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

Course Code: AUT1103 **Time: 1 Hour**

Course Name: AUTOMOBILE BODY REPAIR **Max. Marks: 20**

Instruction:

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

Section – A

Directions: Select any one correct answer from the given options: 05X01 = 05 Marks

Q 1. What is the colour code of warning sign?

a) Blue
b) Green
c) Yellow
d) Red

Q 2. Which of the following is not a part of body section?

a) Bonnet
b) Fender
c) Spoiler
d) Wheel

Q 3. A structure design in which the frame and body are built as a single integrated structure is called.....

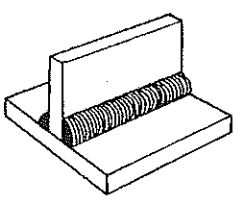
a) Backbone
b) Ladder
c) Monocoque
d) All of the above

Q 4. ..... is a device which reduces lift and increases downforce.

a) Windshield
b) Door
c) Spoiler
d) Bumper

Q 5. The diagram given below shows.....joint.

a) Butt Joint
b) I-Joint
c) Corner Joint
d) T-Join



Section – B

03X02 = 06 Marks

Q 6. Define welding.

Q 7. What are the safety equipment used in welding?

Q 8. What are the roles and responsibilities of body shop technician?

Section – C

03X03 = 09 Marks

Q 9. Discuss the types of car body pillar.

Q 10. What is the requirement of a Body Shop in an automotive workshop?

Q 11. Explain the different types of automotive body styles in India with examples.

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BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

I Semester, 1st/2nd/3rd In-Sem. Examination

B. Voc. Program, Summer/Winter Semester (2018-19)

Course Code: AUT1103 **Time: 1 Hour**

Course Name: AUTOMOBILE BODY REPAIR **Max. Marks: 20**

Instruction: Attempt all questions.

Section – A

Directions: Select any one correct answer from the given options: 05X01 = 05 Marks

Q 1. What is the colour code of warning sign?

a) Blue
b) Green
c) Yellow
d) Red

Answer: d

Q 2. Which of the following is not a part of body sections?

a) Bonnet
b) Fender
c) Spoiler
d) Wheel

Answer: d

Q 3. A structure design in which the frame and body are built as a single integrated structure is called.....

a) Backbone
b) Ladder
c) Monocoque
d) All of the above

Answer: c

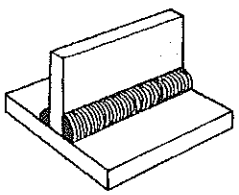
Q 4. ..... is a device which reduces lift and increases downforce.

a) Windshield
b) Door
c) Spoiler
d) Bumper

Answer: c

Q 5. The diagram given below shows.....joint.

a) Butt Joint
b) I-Joint
c) Corner Joint
d) T-Join



Answer: d

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Section – B

03X02 = 06 Marks

Q 6. Define welding.

Answer: Welding is the process of joining two similar or dissimilar metal with the help of heat. It is used to join parts permanently together with the help of heat.

Q 7. What are the safety equipment used in welding?

Answer:

1. King Shield
2. Hand Gloves
3. Welding Apron
4. Safety Shoes
5. Safety Goggle
6. Ear Plug

Q 8. What are the roles and responsibility of body shop technician?

Answer: Role of body shop technician:

- An auto body technician can repair most damage from everyday vehicle collisions and make vehicles look and drive like new.
- Damage may be minor, such as replacing a cracked windshield, or major, such as replacing an entire door panel.

They can do all body work

- Review damage reports, prepare cost estimates, and plan work.
- Remove damaged body parts, including bumpers, fenders, hoods, grilles, and trim.
- Realign car frames and chassis to repair structural damage.
- Hammer out or patch dents, dimples, and other minor body damage.
- Fit, attach, and weld replacement parts into place.
- Install and weatherproof windows and windshields.
- Grind, sand, buff, and prime refurbished and repaired surfaces.
- Apply new finish to restored body parts.

Section – C

03X03 = 09 Marks

Q 9. Discuss the types of car body pillar.

- **Answer:**

- A-pillar

A-pillar is the sloping pillar between which the windshield glass is fixed.

- B-pillar

B Pillar, onto which the front doors click shut. The rear doors are hinged to the B Pillar as well.

- C-pillar

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.

- D-pillar

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.

Q 10. What is the requirement of a Body Shop in an automotive workshop?

Answer: An auto body repairer can repair most damage from everyday vehicle collisions and make vehicles look and drive like new. Damage may be minor, such as replacing a cracked windshield, or major, such as replacing an entire door panel. Repair technicians use many tools for their work. To remove damaged parts, such as bumpers and door panels, they use pneumatic tools, metal-cutting guns, and plasma cutters. For major structural repairs, such as aligning the body, they often use heavy-duty hydraulic jacks and hammers. For some work, they use common hand tools, such as metal files, pliers, wrenches, hammers, and screwdrivers.

In some cases, repair technicians do an entire job by themselves. In other cases, especially in large shops, they use an assembly line approach in which they work as a team with each repair technician specializing. Although repair technicians sometimes prime and paint repaired parts, automotive painters generally perform these tasks. Auto body and related repairers, or collision repair technicians, straighten metal panels, remove dents, and replace parts that cannot be fixed. Although they repair all types of vehicles, most work primarily on cars, sport utility vehicles, and small trucks.

Q 11. Explain the different types of automotive body styles in India with examples.

Answer:

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 cut'. An example of a two-door coupe is the Audi A5.

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

Section 1.01 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.

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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.

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

1st Semester, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

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

Course Name: Automotive spray 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

Direction : Select the one correct option from the given options in the following questions : - **5x1=5 Marks**

Q-1. The substance used for quick drying of putty is...

a. Spray Gun
b. Hardener
c. Thinner
d. None of these

Q-2. The equipment used to spray the paint is...

a. Spray Gun
b. Dry sander
c. Sand Blocks
d. All of the above

Q-3. The equipment used to purify the breathing air in paint booth is...

a. Mask and respirator
b. Dry Sander
c. Hand gloves
d. All of the above

Q-4. The equipment used to remove the extra putty from the surface during surface preparation Process is...

a. Putty Spreader Sheet
b. Dry Sander
c. Spray gun
d. Plier

Q-5. The equipment used to spread putty on the surface during surface preparation is...

a. Sand blocks
b. Dent puller
c. Putty spreader sheets
d. None of these

Section-B

3x2=6 Marks

Q-6. What is meant by paint primer? Why do we use paint primer?

Q-7. Name any four tools used in paint shop.

Q-8. Name any four name of safety equipment which are used in paint shop.

Section-C

3x3=9 Marks

Q-9. Explain different types of spray gun used for painting application.

Q-10. Explain roles and responsibilities of paint shop technician.

Q-11. What are the nozzle sizes of Spray gun for primer application, base coat application and clear coat application?

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

1st Semester, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

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

Course Name: Automotive spray painting **Max. Marks: 20**

Instruction: Attempt all questions

Section-A

Direction : Select the one correct option from the given options in the following questions :-

5x1=5 Marks

Q-1. The substance used for quick drying of putty is...

a. Spray Gun

b. Hardener

c. Thinner

d. None of these

Q-2. The equipment used to spray the paint is...

a. Spray Gun

b. Dry sander

c. Sand Blocks

d. All of the above

Q-3. The equipment used to purify the breathing air in paint booth is...

a. Mask and respirator

b. Dry Sander

c. Hand gloves

d. All of the above

Q-4. The equipment used to remove the extra putty from the surface during surface preparation Process is...

a. Putty Spreader Sheet

b. Dry Sander

c. Spray gun

d. Plier

Q-5. The equipment used to spread the putty on the surface during surface preparation is...

a. Sand blocks
b. Dent puller
c. **Putty spreader sheets**
d. None of these

Section-B

3x2=6 Marks

Q-6. What is meant by paint primer? Why do we use paint primer?

Ans. . Primer paint is a preliminary layer of coating that is applied on the materials prior to the paint.

We use primer because: -

1. It increases the durability of paint.
2. It ensures that the paint adhesion to the surface is proper.

Q-7. Write any four name of tools and equipment which are used in paint shop.

Ans. Spray Gun
Putty Spreader Sheet
Compressor
FRL

Q-8. Write any four name of safety equipment which are used in paint shop.

Ans.
Mask respirator
Surgical Gloves
Googles
Safety Shoes

Section-C

3x3=9 Marks

Q-9. Explain different types of spray gun used for painting application.

Ans. **Spray guns**: - The spray gun is the most popular type of spray application equipment use

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A spray gun is a tool which uses compressed air to atomize 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.

Parts of spray gun:

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

Types of spray guns

1. **Cup spray guns**
2. **Air spray guns**
3. **Airless spray guns**
4. **HVLP spray gun**
5.

Q-10. Explain roles and responsibilities of paint shop 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-11. What are the nozzle sizes of Spray gun for primer application, base coat application and clear coat application?

Ans.

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Tip size	Commonly used for
0.8	Parting Films – PVA – very fine mist
1.2	Clear Coats – super fine finishes
1.4	Clear , base coats and single stage paints
1.6	General Purpose – light to heavy viscosity materials
1.8	Primers – will apply primer quickly
2.2-2.5	Gel Coats and Resins – for thick resins and not paints

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Question Paper

School of Automotive Skills

1st Semester, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

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

Course Name: Automotive Electrical Fundamentals & A.C. **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

Q 1. 45 K in ˚C is:

A. 308

B. 298

C. 318

D. 328

Q 2. Refrigerant used in the cars nowadays is:

A. R410.

B. R32.

C. R132a.

D. R134a.

Q 3. Evaporator in the car is located:

A. Under the deck dashboard.

B. In front of radiator.

C. Under the chassis.

D. In the trunk.

Q 4. If a gas is contained in an air-tight container what will happen to the pressure of the gas if heat is supplied to the container?

A. Decrease.

B. Increase.

C. Remains same.

D. None of the above.

Q 5. Change of state of material can be represented by:

A. Solid to liquid.
B. Solid to gas.
C. Liquid to vapor.
D. All of the above.

Section – B

03X02 = 06 Marks

Q 6. What is the working principle of a thermometer?

Q 7. Define the following:

1. Ozone depletion potential.
2. Global warming potential.

Q 8. Write the law of conservation of energy with suitable examples.

Section – C

03X03 = 09 Marks

Q 9. Differentiate between Heat Engine, Refrigeration and Heat Pump with a diagram, and write expressions for efficiency.

Q 10. Write three points each for the causes and consequences of global warming.

Q 11. Explain refrigeration cycle. Name components of refrigeration cycle and their functions.

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School of Automotive Skills

First Semester, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

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

Course Name: Automotive Electrical Fundamentals & A.C. **Max. Marks: 20**

Section – A

05X01 = 05 Marks

1. 45 K in °C is
   a) 308
   b) 318
   c) 319
   d) 328
2. Refrigerant used in the cars nowadays is
   a) R410
   b) R32
   c) R132a
   d) R134a
3. Evaporator in the car is located:
   a) Under the deck dashboard
   b) In front of radiator
   c) Under the chassis
   d) In the trunk
4. If a gas is contained in an air-tight container what will happen to the pressure of the gas if heat is supplied to the container?
   a) Decrease
   b) Increase
   c) Remains same
   d) None of the above
5. Change of state of material can be represented by:
   a) Solid to Liquid
   b) Solid to Gas
   c) Liquid to vapor
   d) All of the above

Registration No.: .....

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Section – B

03X02 = 06 Marks

6. What is the working principle of a thermometer?
   Answer: The thermometer is based on zeroth law of thermodynamics which states that if there are three bodies A, B and C & A is in thermal equilibrium with B and B is in thermal equilibrium with C Then A and C will also be in thermal equilibrium with each other.

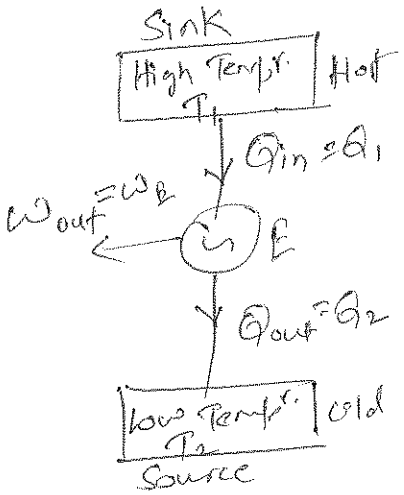
7. Define the following:
   a) Ozone Depletion Potential
      The Ozone Depletion Potential (ODP) is a number that refers to the amount of ozone depletion caused by a substance. The ODP is the ratio of the impact on ozone of a chemical compared to the impact of a similar mass of CFC-11. Thus, the ODP of CFC-11 is defined to be 1.0
   b) Global Warming Potential
      Global warming potential is a relative measure of how much heat a greenhouse gas traps in the atmosphere. It compares the amount of heat trapped by a certain mass of the gas in question to the amount of heat trapped by a similar mass of carbon dioxide.

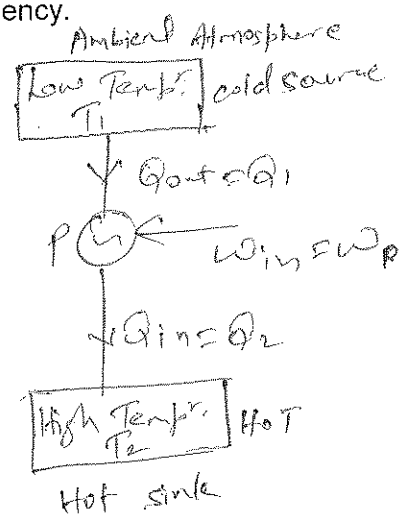
8. Write the law of conservation of energy. Give examples.
   The law of conservation of energy is also known as first law of thermodynamics which says that the energy can neither be created nor can be destroyed it only changes form from one type to another.
   Example: A ball at stationary position at a height have potential energy which is converted to kinetic energy while falling down.
   Chemical energy of fuel is converted into heat energy which in-turn is converted into mechanical energy which drives an engine.

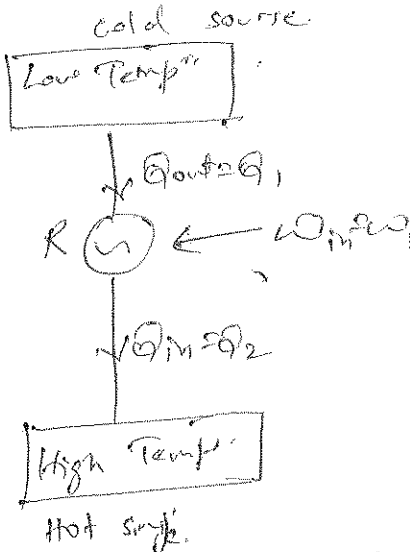
Section – C

03X03 = 09 Marks

9. Differentiate between heat engine, Refrigeration and Heat pump with a diagram and write expressions for efficiency.







Heat engine
$\eta_E = \frac{W_E}{Q_1} = \frac{Q_1 - Q_2}{Q_1}$

$\eta_P = \frac{Q_{in}}{W_{in}} = \frac{Q_2}{Q_2 - Q_1}$ = COP

$\eta_R = \frac{Q_1}{Q_2 - Q_1}$ = COP

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10. Write three points each for the causes and consequences of global warming.

Certain gases in the atmosphere block heat from escaping. Long-lived gases that remain semi-permanently in the atmosphere and do not respond physically or chemically to changes in temperature are described as "forcing" climate change.

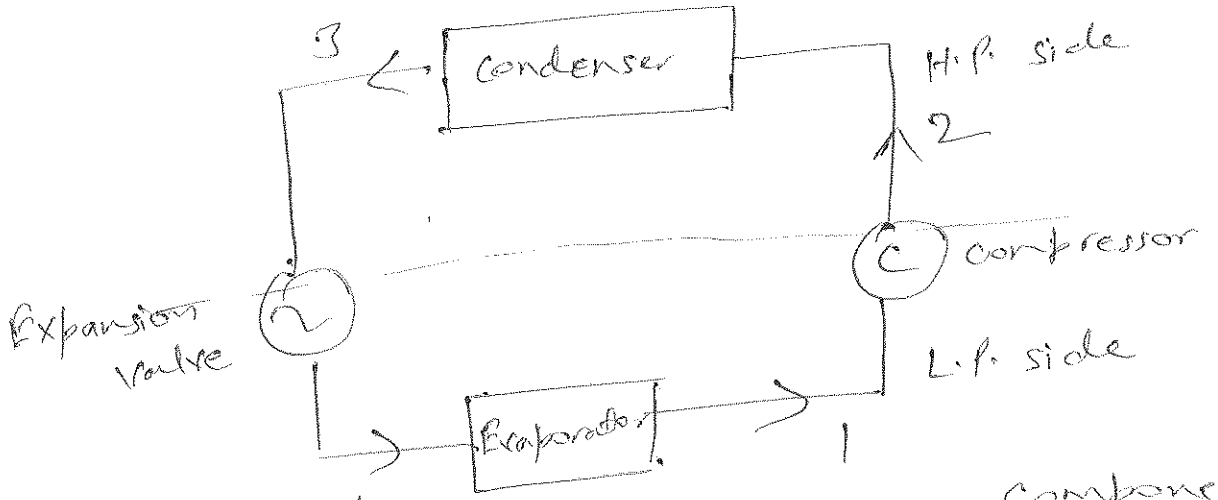
The gases causing global warming are:

- Chlorofluorocarbons (CFCs): Synthetic compounds entirely of industrial origin used in a number of applications.
- Carbon dioxide (CO2): A minor but very important component of the atmosphere.
- Methane: A hydrocarbon gas produced both through natural sources and human activities, including the decomposition of wastes in landfills, agriculture etc.

Consequences are:

- On average, Earth will become warmer. Some regions may welcome warmer temperatures, but others may not.
- Warmer conditions will probably lead to more evaporation and precipitation overall, but individual regions will vary, some becoming wetter and others dryer.
- A stronger greenhouse effect will warm the oceans and partially melt glaciers and other ice, increasing sea level.

11. Explain refrigeration cycle and also write components of refrigeration cycle and its functions.



cycle — component

1-2 — Isentropic compression — compressor

2-3 — Isobaric heat rejection — condenser

3-4 — Isenthalpic expansion — expansion valve / capillary tube

4-1 — Isobaric Heat absorption — Evaporator

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School of Automotive Skills

1st Semester, 1stIn-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

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

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

Instructions: 1. Attempt all questions from section-A and each question carries 1 mark.

2. Attempt all questions from section-B and each question carries 2 marks.

3. Attempt all questions from section-C and each question carries 3 marks.

Section – A

05X01 = 05 Marks

Q-1. The least count defines the.....

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

Q-2. Which type of measurement does not provide numerical values?

a. Gauging
c. Both (A) & (B)
b. Measuring
d. None of the above

Q-3. Why do not we use second angle and fourth angle projection?

a. Due to overlapping
c. Due to lacking
b. Due to complications
d. None of the above

Q-4. Which of the following ratios represents the reducing scale?

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

Q-5. Which value can be the reading of instrument having least count = 20μm ?

a. 20.05
c. 20.06
b. 20.062
d. 20.006

Section – B

03X02 = 06 Marks

Q-6. Mention the parameters required during selection of measuring tools.

Q-7. Differentiate between first angle and third angle projection?

Q-8. What is fit ? Name types of fit

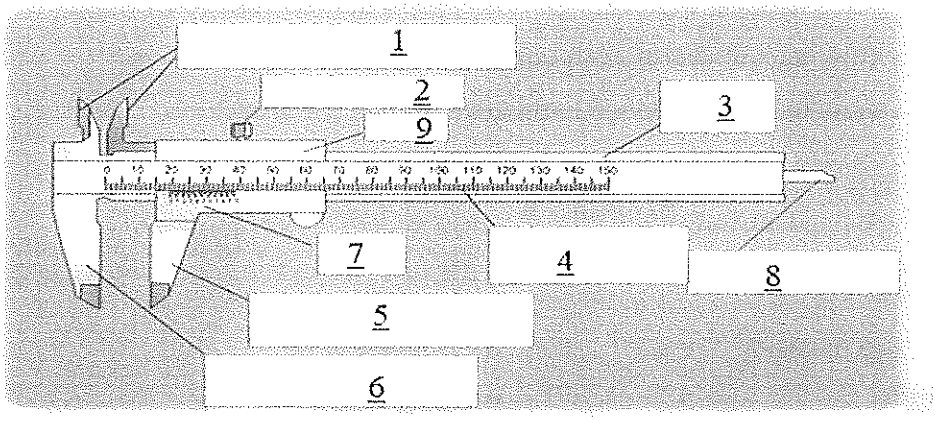
Section – C

03X03 = 09 Marks

Q-9. Calculate the least count of a Vernier caliper whose 50 division of Vernier scale is coinciding with 49 division of main scale. Apply both the methods for least count.

Q-10. Define calibration. Write down different types of error of Vernier caliper?

Q-11. Name the different parts of the following measuring instrument:



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School of Automotive Skills

1st Semester, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

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

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

Instruction: Attempt all questions.

Section – A

05X01 = 05 Marks

Q-1. The least count defines the.....

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

Answer- a

Q-2. Which type of measurement does not provide numerical values?

a. Gauging
b. Measuring
c. Both (A) & (B)
d. None of the above

Answer- a

Q-3. Why we do not use second angle and fourth angle projection?

a. Due to overlapping
b. Due to complications
c. Due to lacking
d. None of the above

Answer- a

Q-4. Which of the following ratios represents the reducing scale?

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

Answer- b

Q-5. Which value can be the reading of instrument having least count = 20μm?

a. 20.05
b. 20.060
c. 20.06
d. 20.006

Answer- b

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Section – B

03X02 = 06 Marks

Q-6. Mention the parameters required during selection of measuring tools.

Ans.1. Range of instrument.

2. Application of instrument.
3. Least count of instrument.
4. Calibration of instrument.

Q-7. 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

Q-8. What is fit? Name types of fit.

Ans The relation between tightness and looseness between two mating parts is called fit. Depending upon the actual limits of the hole or shaft sizes, fits may be classified as:-

1. Clearance fit
2. Interference fit
3. Transition fit

Section – C

03X03 = 09 Marks

Q-9. Calculate the least count of a Vernier caliper whose 50 division of Vernier scale is coinciding with 49 division of main scale. Apply both method for least count.

Ans Least count = Value of 1 division of main scale / No. of division on Vernier scale

= 1/50 mm = 0.02 microns

2nd method: -

Least count= 1- M.S.D / V.S.D

= 1-49/50 = 1/50mm = 0.02 microns

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Q-10. Define calibration. Write down different types of error of Vernier caliper?

Ans Calibration is a process of finding errors in the instrument with the help of some more accurate standards.

Errors in Vernier caliper: -

1. Parallax error
2. Cocking error
3. Tilt error
4. Random error
5. Systematic error

Q-11. Name the different parts of the following measuring instrument?

Ans