Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, 3rd Semester,

2nd In-Sem. Examination

Course Code: AUT1301 **Time: 1 Hour**

Course Name: Automotive Power Train **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 reconditioning process used to give cylinder bore surfaces a crosshatch pattern, is known as

A. Honing

B. Porous plating

C. Boring

D. Shot peening

Q 2. The materials used for cylinder block are

A. Cast iron and steel

B. Cast iron and aluminum alloy

C. Steel and aluminum alloy

D. Brass and steel.

Q 3. The condition that results in large quantities of HC emission is

A High temperature combustion

B Incomplete combustion

C Low temperature combustion

D High atmospheric temperature combustion

Q 4. The exhaust gas from petrol engine contains

A Petrol vapours
B Water vapours
C Carbon monoxide
D All of these

Q 5. The main function of a resonator is that it

A Regulates the intake air flow rate
B Reduces the intake air noise
C Enhances intake efficiency
D Regulates the intake air temperature

Section – B

03X02 = 06 Marks

Q 6. What is the function of air induction system?

Q 7. Write different components of EVAP System.

Q 8. What is the purpose of EVAP System?

Section – C

03X03 = 09 Marks

Q 9. Explain the working of throttle body.

Q.10 What are the various Types of air-induction system

Q 11. Explain the standard operating procedure of checking piston rings.

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Section – A

05x01 = 05 Marks

Q 1. The reconditioning process used to give cylinder bore surfaces a crosshatch pattern, is known as

A. **Honing**

Q 2. The materials used for cylinder block are

B. Cast iron and aluminum alloy

Q 3. The condition that results in large quantities of HC emission is

B Incomplete combustion

Q 4. The exhaust gas from petrol engine contains

D All of these

Q 5. The main function of a resonator is that it

B Reduces the intake air noise

Section – B

03X02 = 06 Marks

Q 6. What is the function of air induction system?

Ans: Following are the function of air induction system

1. Supply the filter air to combustion chamber
2. Meter the amount of air entering.
3. muffles induction noise

Q 7. Write different components of EVAP System.

Ans: Following are the components of EVAP system

1. Charcoal canister
2. Purge Valve

3. Fuel Separator
4. Vapor vent pipeline

Q 8. What is the purpose of EVAP System?

Ans: Evaporative emissions are raw gasoline vapors that can escape from a vehicle under several different circumstances. Evaporative emissions are in addition to those released from the tail pipe. Gasoline fuel molecules are large and heavy and stay close to the ground. They contribute significantly to urban smog. The whole idea of evaporative emissions controls is to trap these fuel vapors before they can escape to the atmosphere

Section – C

03X03 = 09 Marks

Q 9. Explain the working of throttle body.

Ans: The amount of air that enters a spark ignition engine is primarily controlled by the driver moving the accelerator pedal. The foot-operated pedal connects through linkage or cable to the throttle valve in the throttle body.This is air-control device for all spark ignition engines.

Depressing the accelerator pedal opens the throttle valve. This allows fresh air from the air cleaner to enter the intake manifold. The throttle valve controls only air if the engine has port (multipoint) or throttle body injection.

Throttle valve is fitted with following sensors and actuator

MAP Sensor: It is Manifold Absolute pressure sensor, which checks the vacuum pressure developed in the intake and thereby helps in calculating the amount of air entering.

TPS Sensor: Throttle position sensor, which tells exact position of throttle vale in real time

IAC Valve: This is a solenoid based actuation valve, which provide the path for air during idling.

Q.10 What are the various Types of air-induction system

Ans: Following type of air induction system is commonly used in ICE

Cold Air Intake Systems: Cold air intake assemblies feature a longer tube with an air filter positioned on the front end. Because this filter is mounted further away from the engine block itself, it can draw air that's actually cooler in temperature. The filter is often positioned near the front corner of the vehicle or even directly behind a bumper or grille. The benefit of drawing in cooler air is that it's denser and packed with more oxygen - allowing more fuel to be burned for increased power. In fact, engineers estimate that every 10-degree F drop in intake air temperature increases power by one percent. It is conventional type of air

induction system, which uses small length air pipe and Filter is installed very near to the engine block making air heated up due to the heat of engine itself.

Hot Air Intake system: A heated air inlet or warm air intake is a system commonly used on the original air cleaner assemblies of carbureted engine to increase the temperature of the air going into the engine for the purpose of improving the consistency of the air/fuel mixture to reduce engine emissions and fuel usage

Ram Air Intake system: Another method of channeling cooler air into the engine is the "ram air" intake design. In this setup, a longer tube scoops up air from high-pressure areas at the front of the vehicle. But unlike cold air intakes which have the air filter positioned at the front of the tube, ram air assemblies have air filters mounted in a traditional location back by the engine. Ram air intakes may be equipped with additional pre-filters at the front for protection against splash-up and dust from the road.

Q 11. Explain the standard operating procedure of checking piston rings.

Ans: Following procedure is adopted while checking piston rings

Push a compression ring down to the bottom of ring travel in the cylinder. Measure the ring end gap. Typical end gap is 0.25 to 0.51mm.

If the gap is too small, the ring diameter is too large. A smaller diameter ring set is needed. Some rings can be filed to get the proper end gap

If the end gap is with in specification, check the fit of each compression ring in its piston groove. Roll the ring in the groove, if the fit is tight, the groove probably needs cleaning.

Check the ring side clearance between ring and groove. Measure the clearance between ring and groove, it should be at least .025mm.

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BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, 3rd Semester,

2nd In-sem. Examination

Course Code: AUT 1302 **Time: 1 Hour**

Course Name: Automotive Breaking, Suspension and Steering System **Max. Marks: 20**

Instruction:

1. All the questions are compulsory to attend.
2. Students are not allowed to bring any smart device or cell phone in the exam hall.
3. Marks will be deducted if any overwriting in words will be found.

Section – A

05X01 = 05 Marks

1. The assembly of coil spring and damper is called...

   a) Shock absorber b) Strut

   c) a & c d) None of the above

2. Vulcanizing liquid is being used in the process of.....

   a) Tire patch repair b) Hot re-treading

   c) a & b d) None of the above

3. Does the spring rate change as the vehicle gets older?

   a) Yes b) No

   c) Depends upon the diameter of coil d) Depends upon the number of coil

4. What is Macpherson strut system?

a) Steering system
b) Suspension system
c) Braking system
d) None of these

5. Which parts of an automobile is first suspension for the vehicle?

a) Leaves of leaf spring
b) Coil Spring
c) Tires
d) None of the above

Section – B

03X02 = 06 Marks

6. What is tire wear? How can we check the tire wear?
7. Write a short note on MacPherson strut suspension system?
8. What is the requirement of tire rotation? Write down the procedure of tire rotation for a front wheel drive passenger car.

Section – C

03X03 = 09 Marks

9. What is a shock absorber? Explain the operation of shock absorber.
10. What is re-treading process? Briefly explain types of re-treading process.
11. Explain the process for inspection and rectification of faulty suspension system?

Registration No.: .....

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Section – A

05X01 = 05 Marks

1. The assembly of coil spring and damper is called...

   a) Shock absorber
   b) Strut
   c) a & c
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5. Which parts of an automobile is first suspension for the vehicle?

a) Leaves of leaf spring
b) Coil Spring
c) Tires
d) None of the above

Section – B

03X02 = 06 Marks

6. What is tire wear? How can we check the tire wear?

Ans.

- As tires are used, it is normal for the tread to gradually become shallower and overall tire performance to change. The depreciation of tread depth is what is referred to as tyre wear. In addition, irregular tread wear may occur for a variety of reasons that may lead you to have to replace a tire sooner rather than later.

Ways to check tire wear:

- If you have a tire tread depth gauge, use it to measure the tread depth. Insert the probe bar into the groove and push the shoulders flush with the tread. Check the top of the gauge to see the measurement. Alternately, a small ruler can be used.

7. Write a short note on MacPherson strut suspension system?

Ans.

MacPherson Sturt:

The **MacPherson strut** is a type of automotive **suspension** system that uses the top of a telescopic damper as the upper steering pivot. It is widely used in the front **suspension** of modern vehicles and is named for American automotive engineer Earle S. **MacPherson**, who originally invented and developed the design.

- A MacPherson strut includes the suspension spring that transfers the weight of the body to the wheel. A MacPherson strut is the main, load-carrying suspension spring.
- A MacPherson strut typically incorporates an upper and a lower spring seat, a shock absorber mounts and dust cap, a dust cover for the piston rod, and a bump stop.

- The upper mount secures the upper spring seat to the strut tower. A rubber bushing at the top of the strut absorbs vibrations. In most applications, a bearing on the top of a front-wheel strut allows it to rotate on the vertical steering axis without rubbing against the strut tower when the steering knuckle turns.
- The lower spring seat is attached to the strut casing. The piston rod dust cover is similar to the dust cover on a conventional shock absorber, and a bump stop at the top of the piston rod keeps the strut from bottoming out during suspension jounce.

8. What is the requirement of tire rotation? Write down the procedure of tire rotation for a front wheel drive passenger car.

Ans.

Need for Tyre Rotation:

- In general terms, a car has a front axle, and a rear axle, both of these have a set of tyres under their control and have a specific role to play. It is known that the tyres at the front axle wear faster than the tyres at the rear axle.
- This is because the front carries more than 60% of the weight and have exponentially greater tasks to perform like steering, braking, accelerating etc. Meanwhile, the rear ones only undergo wear and tear due to traction and braking.

Tyre Rotation:

- Tyre rotation is the process of changing the position of the tyres on your vehicle, often done by swapping front and rear car tyres. Ideally, tyres should be rotated at intervals of 6000 miles for cars and around 4000 miles for 4x4 vehicles, unless the manufacturer states otherwise.

Section – C

03X03 = 09 Marks

9. What is a shock absorber? Explain the operation of shock absorber.

SHOCK ABSORBER OPERATION:

The hydraulic shock absorber operates on the principle of fluid being forced through a small opening (orifice). Besides small openings, pressure relief valves are built into most shock absorbers to control vehicle ride under all operating conditions. The greater the pressure

drop of the fluid inside the shock and the greater the amount of fluid moved through the orifice, the greater the amount of dampening; therefore, larger shock absorbers can usually provide better dampening than smaller units.

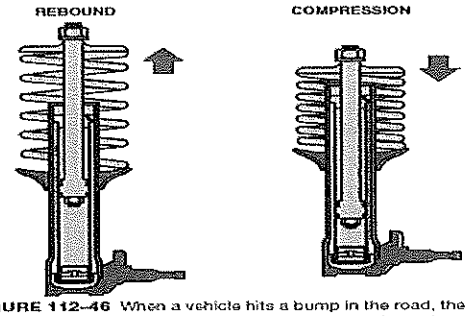

FIGURE 112–46 When a vehicle hits a bump in the road, the suspension moves upward. This is called compression or jounce. Rebound is when the spring (coil, torsion bar, or leaf) returns to its original position.

10. What is re-treading process? Briefly explain types of re-treading process.

Re-treading:

Re-tread is a re-manufacturing process for tires that replace the tread on worn tires. Re-treading is applied to casings of spent tires that have been inspected and repaired. It preserves about 90% of the material in spent tires and the material cost is about 20% compared to manufacturing a new one.

1. **Hot Re-treading:** Hot re-treading involves the vulcanisation of a tyre in a mould at a temperature of around 150 °C. The tread and the sidewall veneer of the tyre are made up of non-vulcanised rubber compounds. The shape and tread of the tyre are created in the heating press.

2. **Cold Re-treading:** Precure or "cold" re-treading involves vulcanisation without a mould at a temperature of between 95 °C and 110 °C. The tyre is put together using a pre-vulcanised tread liner (= new tread) and a non-vulcanised bonding gum layer. The bond between the carcass, the bondung gum and the pre-cured tread is created in an autoclave. Precure re-treading has become fully established in the truck tyres sector since the introduction of radial tyres in the mid-1960s.

11. Explain the process for inspection and rectification of faulty suspension system?

Ans.

VISUAL INSPECTION: All suspension components should be carefully inspected for signs of wear or damage. A thorough visual inspection should include checking all of the following:

- Shock absorbers or struts.
- Springs
- Stabilizer bar links
- Stabilizer bar bushings
- Upper and lower shock absorber mounting points
- Bump stops
- Body-to-chassis mounts
- Engine and transmission (transaxle) mounts
- Suspension arm bushings

ROAD TEST DIAGNOSIS: If possible, perform a road test of the vehicle with the owner of the vehicle. It is also helpful to have the owner drive the vehicle. While driving, try to determine when and where the noise or problem occurs, such as the following:

1. In cold or warm weather

2. With cold or warm engine/vehicle

3. While turning, left only, right only

- A proper road test for any suspension system problem should include the following:

1. Drive beside parked vehicles
2. Drive into driveways.
3. Drive in reverse while turning
4. Drive over a bumpy road

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BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

3rd Semester, 2nd In-Sem. Examination

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

Course Code: AUT1303 Time: 1 Hour

Course Name: Automotive Body Works Max. Marks: 20

Instruction:

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

05X01 = 05 Marks

Q1. What is the first step in preparing a bare metal surface from corrosion protection?

a) Clean with lacquer thinner
b) Clean with soap and water
c) Sand with coarse sand paper
d) Clean with wax and grease removal

Q2. ..... is the event in which two or more bodies exert forces on each other in about a relatively short time.

a) Denting
b) Bending
c) Clamping
d) Collision

Q3. ..... is an essential tool for the quick removal of paint, primer and old body filler from an area being repaired?

a) Sliding hammers
b) Sander
c) Shears
d) Nibblers

Q4. Which of the following would you use first when preparing bare metal surface for corrosion protection?

a) Sand with coarse sand paper
b) Clean with wax and grease remover
c) Clean with lacquer thinner
d) Clean with soap and hot water

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Q5. A stamping tool is used for .....the dented panel.

a) Restoring Bodyline
b) Making Holes
c) Pulling out dents
d) Pressing

Section – B

03X02 = 06 Marks

Q6. Mention the differences between dolly-on and dolly-off hammering.

Q7. What are the advantages and disadvantages of chemical stripping?

Q8. Write short note on sanding and grinding.

Section – C

03X03 = 09 Marks

Q9. How to repair rusted Panels?

Q10. Write steps to remove front bumper assembly.

Q11. Explain window mechanism with diagram

A·S.

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BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

3rd Semester, 2nd In-Sem. Examination

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

Anwersheet

Course Code: AUT1303 Time: 1 Hour

Course Name: Automotive Body Works Max. Marks: 20

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2. Answer all questions from **"Section-B"**, each question carries 02 marks.
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Section – A

05X01 = 05 Marks

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a) Clean with lacquer thinner
b) Clean with soap and water
c) Sand with coarse sand paper
d) Clean with wax and grease removal

Q2. ..... is the event in which two or more bodies exert forces on each other in about a relatively short time.

a) Denting
b) Bending
c) Clamping
d) Collision

Q3. ..... is an essential tool for the quick removal of paint, primer and old body filler from an area being repaired?

a) Sliding hammers
b) Sander
c) Shears
d) Nibblers

Q4. Which of the following would you use first when preparing bare metal surface for corrosion protection?

a. Sand with coarse sand paper
b. Clean with wax and grease remover

c. Clean with lacquer thinner d. Clean with soap and hot water

Q5. A stamping tool is used for .....the dented panel.

a) Restoring Bodyline
b) Making Holes
c) Pulling out dents
d) **Pressing**

Section – B

03X02 = 06 Marks

Q6. Mention the differences between dolly-on and dolly-off hammering.

Ans. **Dolly- on hammering**

- Hold dolly against back of damage and hammer right over to of dolly.
- Repeatedly move point of hammer impact and dolly slightly, each blow overlapping.
- Start at outside and work towards center.
- Shapes of dolly and hammer must match desired shape of panel.
- Start with light hammer blows, and work up to stronger blows.

Dolly-off hammering

- It is used to raise low spots and lower high sport simultaneously.
- The hammer hits the panel slightly to one side of where the dolly is being held.
- It is often used to rough out or shape large areas of damage during initial straightening.

Q7. What are the advantages and disadvantages of chemical stripping?

Ans: -

Advantages

- It is used to remove all types of liquid as well as powder paints, lacquers, enamels & polyurethanes from the metal surface.
- It reduces the cleaning effort.
- It saves time.
- It strips large area like doors, panel, bonnet, etc.
- Capability to strip tough configurations.

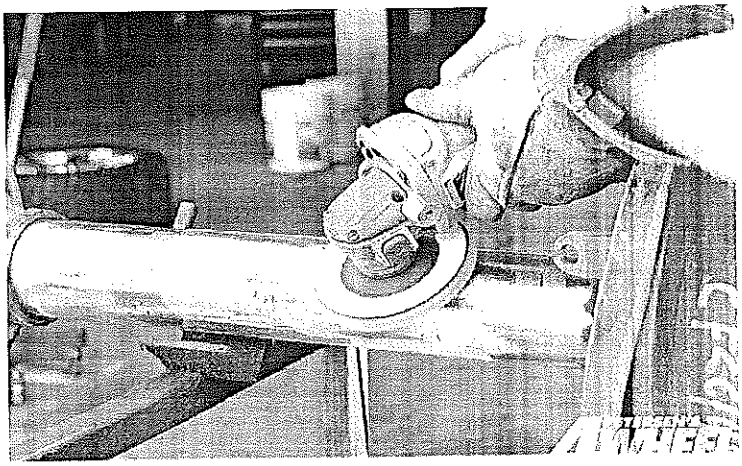
Disadvantages

- It couldn't be applicable for plastic materials like front and rear bumper.
- Waste could be hazardous.
- It causes irritation while contact to our skins.
- Slow stripping rate.

Q8. Write short note on sanding and grinding.

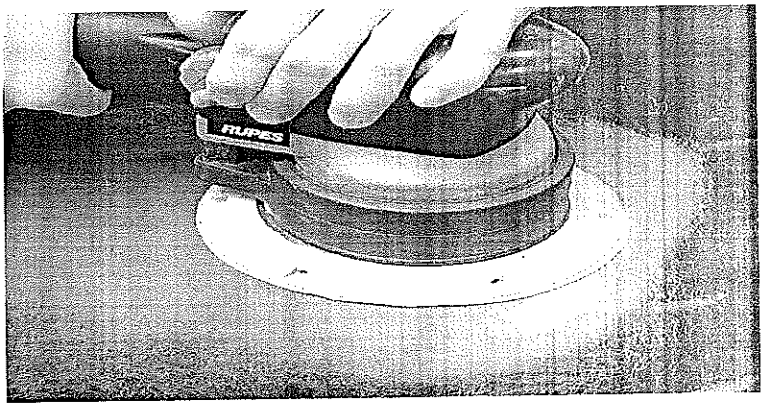
Ans. Grinding

A grinder is a power tool with a spinning abrasive disc, used for grinding, smoothing, and shaping materials, usually metal.



Sanding

Sanding is the process of smoothing or polishing a surface with sandpaper.



Section – C

03X03 = 09 Marks

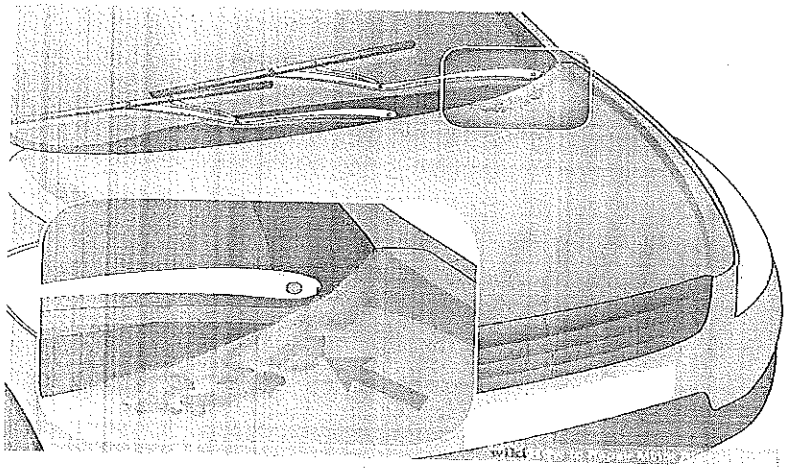
Q9. How to repair rusted Panels?

Ans: -

Although we usually envision collision repair whenever we think of automotive bodywork, rust repair is often just as common. Rust may be rare in some regions. but it is all too common in the rest of the world.

Anywhere that humidity meets unprotected sheet metal, rust is hard at work eating its way through your automobile's sheet metal. Sadly, you may not even know that the rust is present, as it tends to do its damage to area of your vehicle that you don't normally see

during everyday operation. When you dealing with rust, you should determine whether it is just surface rust or a rust-through.



MINOR SURFACE RUST REMOVAL

1) Mask off the affected area with paint-appropriate tape. You want a few inches of protection surrounding the rust spot.
2) Follow the directions on the rust remover, usually spraying or brushing it onto the rust and letting it sit for a few minutes. Then, wipe off any residue with a clean rag. Remember that rust remover is nasty stuff, so be sure to wear the appropriate protective gear when handling it.
3) The rust should be gone, but remove any leftover rust with sandpaper.
4) Clean with a grease and wax remover soap, then air dry.
5) Spray primer in a light-to-medium coat, and allow an hour to dry. Spray three coats.
6) Spray the color base coat, going thinner than the primer. You may have to do five or six coats for complete coverage. Give it plenty of time between coats to prevent drips.
7) Spray the clear coat. Wait two or 3 days before washing, and wait a minimum of two months (some body shops suggest waiting for six) before waxing.

MAJOR RUST REMOVAL

1) Mask off the affected area. If sanding through paint and primer, cover the rest of the vehicle to protect it from the super-fine dust.
2) Use a grinder with a sanding wheel to remove as much surface rust as you can. When removing the rust, remember not to bear down any heavier than you absolutely need to.
3) Clean the work area with grease remover.
4) Use a fiberglass-reinforced body filler for holes and depressions left over after digging out the rust. Allow it to cure completely. This could take quite some time, and shouldn't be done at all if it's any cooler than about 65 degrees outside.
5) Sand the filler with progressively finer grit sandpaper, and then clean with wax and grease remover.

6) Tape off the area to be painted.
7) Use the self-etching primer and wait the required drying time.
8) Spray several light coats of paint.
9) Finish with a coat or two of clear. Like above, hold off on washing and waxing.

Q10. Write steps to remove front bumper assembly.

Ans: -

Step 1- Remove Front Beauty Cover

- Remove plastic push-pins holding the top plastic shroud that rests on top of the front clip and extends around the engine bay, including the weather-stripping used to seal out water.
- Once all pins are removed, peel back the weather stripping to loosen the cover.
- Pins locations shown with arrows in the photo below. Once free, set the cover aside.

Step 2- Remove Plastic fasteners

- Remove the plastic fasteners on the upper portion of the front bumper on each side.
- Use a flathead screw driver or the appropriate removal tool and pry upward.

Step 3 - Remove Upper portion bolts

- Remove the 10mm Bolts on the upper portion of the bumper as pictured.

Step 4 - Remove Clips from Under Bumper

- Remove push pin clips from the bottom side of the bumper which hole the splash shield in place.
- Use a flathead screw driver or the appropriate removal tool and pry away.

Step 5 - Remove Clips from the fender areas

- Use a flathead screw driver or the appropriate removal tool and pry away.

Step 6 - Remove Front Clip

- Pull sides of front bumper outward until retention clips release on driver and passenger side.
- See photo below for arrows showing location of retention clips.
- After each side is successfully released, remove front bumper by pulling forward from the grill area. You will not be fully removing the bumper from the car at this moment.

Step 7 - Remove Fog Light Clips and Head Lamp Washer

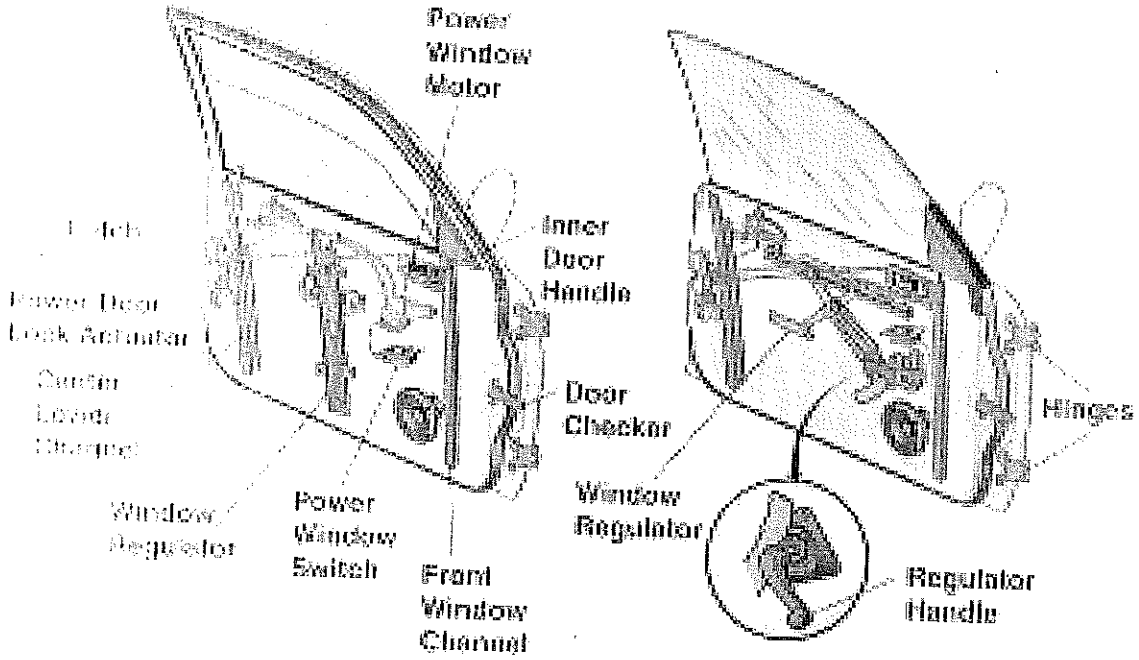
Step 8 - Complete Removing the Front Bumper

- Fully remove the front bumper by continuing to pull forward in a slow motion.
- If removing the bumper yourself, its recommended to place a towel/blanket on the ground so that you do not scrape anything if dragged or dropped on the ground.

Q11. Explain window mechanism with diagram

Windows Mechanisms

Among the items in the door that that can be damaged, other key areas include the window glass, the window riser mechanism (manual or electric), and the window channel in which the glass slides. If they are damaged, these items are most likely to require replacement, rather than repair. Anything that cause glass to be misaligned or in a bind will eventually lead it to break, so it is better to replace the necessary parts now while the vehicle is disassembled, instead of waiting until later, when you will have to disassemble and reassemble the door again.



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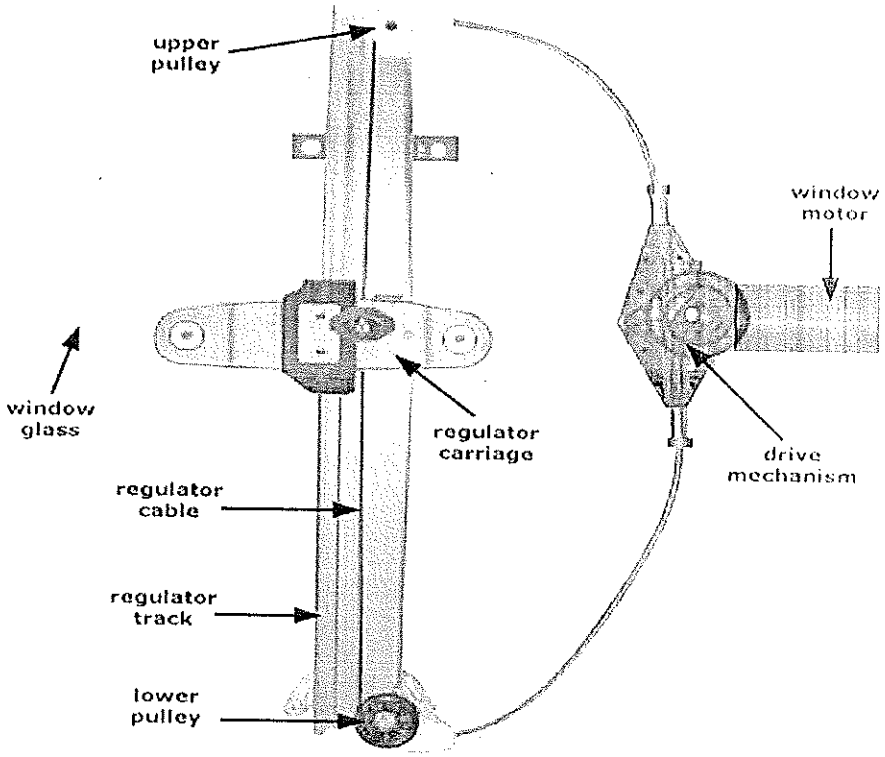

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BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, 3rd Semester,

2nd In-Sem. Examination

Course Code: AUT1304 **Time: 1 Hour**

Course Name: Automotive Refinish Painting **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. What does 1-k represent?

a. 1000
b. Product with hardener
c. Product without hardener
d. None of these

Q-2. Wash primer is a.....primer?

a. 1 K
b. 2 K
c. Both A & B
d. None of the above

Q-3. What is the best way of removing the dust particles after putty dry sanding?

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

Q-4. What is the mixing ratio (in gram) of polyester putty & hardener?

a. 100: 2
b. 100:10
c. 100:12
d. As per manufacturer

Q-5. Which of the following paint layer is not a part of refinish painting?

a. Electro Phosphating
b. Epoxy primer
c. Polyester putty
d. Body filler

Section – B

03X02 = 06 Marks

Q-6. What is the difference between body filler and putty?

Q-7. Write down the SOP of Minor Repair?

Q-8. What is the difference between wash Primer and Surfacer?

Section – C

03X03 = 09 Marks

Q-9. What are the factors that influences the colors?

Q-10. What are the causes of runs on the panel? Expalin its precaution and remedies.

Q-11. Explain at least three different types of paint defects and its causes.

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BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, 3rd Semester,

2nd In-Sem. Examination

Course Code: AUT1304 **Time: 1 Hour**

Course Name: Automotive Refinish Painting **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. What does 1-k represent?

a. 1000
c. Product without hardener
b. Product with hardener
d. None of these

Q-2. Wash primer is a.....primer?

a. 1 K
c. Both A & B
b. 2 K
d. None of the above

Q-3. What is the best way of removing the dust particles after putty dry sanding?

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

Q-4. What is the mixing ratio (in gram) of polyester putty & hardener?

a. 100: 2
c. 100:12
b. 100:10
d. As per manufacturer

Q-5. Which of the following paint layer is not a part of refinish painting?

a. Electro Phosphating
c. Polyester putty
b. Epoxy primer
d. Body filler

Section – B

03X02 = 06 Marks

Q-6. What is the difference between body filler and putty?

Ans. Body filler is used when the size of dent is large because the density of body filler is lesser than the putty due to bigger grain size.
Putty is used to finish the layer of body filler and to fill the scratches and small dents as the density of putty is more than body filer due to smaller grain size.

Q-7. Write down the SOP of Minor Repair?

Ans.
Step 1: Pre-Cleaning
Step 2: Initial Prep Sand
Step 3: Mix and Apply Filler
Step 4: Sand Filler
Step 5: Mix and Apply Glaze
Step 6: Sand Glaze
Step 7: Final Sand and Inspect

Q-8. What is the difference between wash Primer and Surfacer?

Ans. The wash primer is a specific type of primer designed to protect metal and allow good adhesion of paint. So when you are painting metal, it's essential to use this product to prevent the material itself from causing the paint to deteriorate and peel off. The wash primer is applied using a paint spray gun and the film thickness is usually 0.3-0.5 mils. The acid etches the metal surface and provides for good adhesion. A conversion coating is a slightly acidic aqueous solution (water-based) of chemicals.

Objects such as stainless steel and anodized parts should be sanded to loosen the anodized portion and promote adhesion of the wash primer. For anodized aluminum of architectural grade, the surface should be sanded using 40-80 grit sandpaper until the profile of the surface can be seen

Section – C

03X03 = 09 Marks

Q-9. What are the factors that influences the colors?

Color influencing factors are:

Ans. Environment

- Product
- Application
- Equipment

Q-10. What are the causes of runs on the panel? Expalin its precaution and remedies.

- Ans.

Causes:

- Incorrect spraying viscosity, spraying technique.
- Defective spray gun set up.
- Incorrect spraying pressure.

- Temperature of paint, substrate or spray booth too low.
- Incorrect choice of hardeners and thinners.

Prevention:-

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

Remedies:-

- Sand and polish.
- Sand and repaint.

Q-11. Explain at least three different types of paint defects and its causes.

Ans.

- Clouding:

Causes: -

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

- Solvent popping:

Causes: -

- Insufficient drying of primer filler in corners, edges, and below decorative strips.
- Incorrect choice of hardeners and thinners.
- Film build too high.
- Wrong spraying technique.

- Orange peel

Causes: -

- Unsuitable combination of solvents or low quality solvents.
- Insufficient sanding of substrate.
- Incorrect spray gun set up.
- Excessive temperature.

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School of Automotive Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, 3rd Semester,

2nd In-Sem. Examination

Course Code: AUT1305 **Time: 1 Hours**

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

Instruction:

1. Attempt all the questions.
2. Draw neat and clean diagram.

Section – A

5X01 = 5 Marks

1. The capacity of vehicle battery is expressed in terms of:
   a) Current rating
   b) Voltage rating
   c) Ampere hour rating
   d) None of the above
2. If a battery is to be charged at a much higher rate as compared to normal charging rate, the charging should be restricted to:
   a) 95% of the capacity of battery
   b) 80% of the capacity of battery
   c) 55% of the capacity of battery
   d) 35% of the capacity of battery
3. The process of producing electric current through the variable magnetic field is called.....
   (a) Electrification
   (b) Patience
   (c) Electromagnetic induction
   (d) Parabolic
4. A transformer transform:
   (a) Current
   (b) Voltage
   (c) Both A and B
   (d) frequency
5. The property of materials in which the application of mechanical stress generates electricity is called:
   a) Static electricity
   b) Piezoelectricity
   c) Conductivity
   d) None of the above

Section – B

02X03 = 06 Marks

1. Define transformer and function of a transformer.
2. Explain voltage generation through piezoelectric effect.
3. The charging and discharging of vehicle battery done through which internal electrical components? Name them.

Section – C

03X03 = 09 Marks

1. Explain principal of operation, working and chemical reaction of lead acid battery.
2. Explain faraday law of electromagnetic induction with neat sketch and the parameters on which its value depends.
3. A multimeter is used for measurement of various electrical properties, name them all.

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School of Automotive Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, 3rd Semester,

2nd In-Sem. Examination

Course Code: AUT1305 **Time: 1 Hours**

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

Instruction:

1. Attempt all the questions.
2. Draw neat and clean diagram.

Section – A

5X01 = 10 Marks

1. C
2. B
3. C
4. C
5. B

Section – B

02X03 = 6 Marks

1. Transformers are electrical devices consisting of two or more coils of wire used to transfer electrical energy by means of a changing magnetic field. Function of a transformer is to transform alternating current energy from one voltage to another voltage.

2. Piezoelectric Effect is the ability of certain materials to generate an electric charge in response to applied mechanical stress.

3. Alternator and startor motor

Section – C

03X03 = 09 Marks

1. Principal and working: When the sulfuric acid dissolves, **its molecules break up into positive hydrogen ions ($2H^+$) and sulphate negative ions (SO_4^-) and move freely**. ... The SO_4^- ions being negatively charged moved towards the electrodes connected to the positive terminal of the supply main (i.e., anode).

At the anode: $Pb + HSO_4^- \rightarrow PbSO_4 + H^- + 2e^-$

At the cathode: $PbO_2 + 3H^- + HSO_4^- + 2e^- \rightarrow PbSO_4 + 2H_2O$

Overall: $Pb + PbO_2 + 2H_2SO_4 \rightarrow 2PbSO_4 + 2H_2O$

2. It is a basic law of electromagnetism predicting how a magnetic field will interact with an electric circuit to produce an electromotive force (EMF). This phenomenon is known as electromagnetic induction.

3. Multimeter measures: current, voltage, continuity, resistance, capacitance etc.

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Registration No.: .....

School of Automotive Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, 3rd Semester,

2nd In-Sem. Examination

Course Code: GEN1308 **Time: 1 Hour**

Course Name: Basics of AutoCAD & SolidWorks **Max. Marks: 20**

Instruction:

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

Section – A

05X01 = 05 Marks

Q1. A Polyline can be broken into individual lines and arcs using which of the following command?

a) TRIM.
b) EXPLODE.
c) BREAK.
d) OVERKILL.

Q2. Find the false statement in regards with "If an array is made associative".

a) You can't use Boolean operations on the array elements.
b) To make the array non associative you need to use explode command on it.
c) The array can be edited again by selecting it.
d) The array can't be modified in any way once it is made associative.

Q3. The shortcut to start a table is .....

a) T.
b) TA.
c) TBL.
d) TABLE.

Q4. A line 4mm in length inclined at 75 degrees to the x- axis can be represented as .....

a) @ 4 < 75
b) @ 0 < 15
c) @ 4 < 15
d) @ 0 < 75

Q5. The command used to convert separate entities into a polyline .....

a) Union.

b) Subtract.

c) Join.

d) Polyline.

Section – B

03X02 = 06 Marks

Q6. What do you understand by Array command in AutoCAD? Write down the types of Arrays.

Q7. What do you understand by using Match Properties in AutoCAD?

Q8. Why do we make isometric drawings in AutoCAD? What does it specify in terms of 3D?

Section – C

03X03 = 09 Marks

Q9. Explain the following:

a) BLOCKS.

b) GROUPS.

c) ATTRIBUTES.

Q10. What do you understand by parametric constraints?

Q11. What do you understand by 3D operation in an AutoCAD? Explain about rotating, aligning & mirroring an object in AutoCAD 3D.

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Answer Key

School of Automotive Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, 3rd Semester,

2nd In-Sem. Examination

Course Code: GEN1308 **Time: 1 Hour**

Course Name: Basics of AutoCAD & SolidWorks **Max. Marks: 20**

Section – A

05X01 = 05 Marks

Q1. A Polyline can be broken into individual lines and arcs using which of the following command?
Answer: b) EXPLODE.

Q2. Find the false statement in regards with "If an array is made associative".
Answer: d) The array can't be modified in any way once it is made associative.

Q3. The shortcut to start a table is .....
Answer: d) TABLE.

Q4. A line 4mm in length inclined at 75 degrees to the x- axis can be represented as .....
Answer: c) @ 4 < 15

Q5. The command used to convert separate entities into a polyline .....
Answer: c) Join.

Section – B

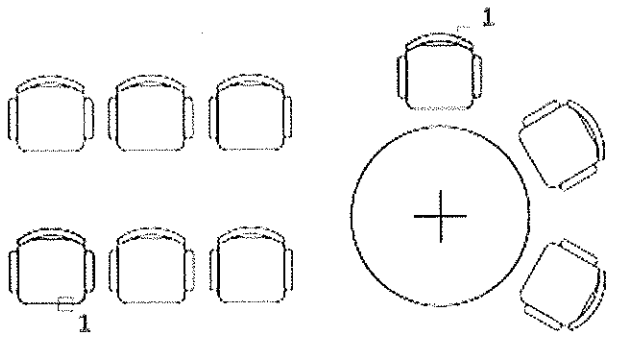
03X02 = 06 Marks

Q6. What do you understand by Array command in AutoCAD? Write down the types of Arrays.

Answer:

Creates copies of objects arranged in a pattern.

You can create copies of objects in a regularly spaced rectangular, polar, or path array.



The following prompts are displayed.

Select objects

Specifies the object to be arrayed.

Note: Attribute objects cannot be arrayed and are automatically filtered from the selection set.

Rectangular

Distributes copies of the selected object into any combination of rows, columns, and levels (same as the ARRAYRECT command).

Path

Evenly distributes copies of the selected object along a path or a portion of a path (same as the ARRAYPATH command).

Polar

Evenly distributes copies of the object in a circular pattern around a centre point or axis of rotation (same as the ARRAYPOLAR command).

Q7. What do you understand by using Match Properties in AutoCAD?

Answer: AutoCAD users are likely to be familiar with the Match Properties command (MATCHPROP), which allows you to quickly copy properties such as layer, colour, and linetypes from one AutoCAD entity and apply them to another.

When you match properties between style-based AEC objects, both the style properties and the display properties of the selected source object are applied to one or more selected destination objects. For non-style-based objects, only display properties are matched. In either case, the display properties are applied to all display representations of the destination object.

Q8. Explain Solid Primitives of AutoCAD 3D?

Answer:

Solid Primitives are the 3D objects which are easily draw by modelling panel.

Shape	Command	Description
Box	Box	Creates a solid box after you provide 2 opposite corners.
Sphere	Sphere	Creates a solid sphere from a centre point and radius.
Cylinder	Cylinder	Creates a straight cylinder from a centre point, radius and height.
Cone	Cone	Creates a tapered cone from a centre point, radius and height.
Wedge	Wedge	Creates a triangular wedge from 2 opposite points.
Torus	Torus	Creates a torus (donut shape) based on centre point, radius and tube radius.

Section – C

03X03 = 09 Marks

Q9. Explain the following:

a) BLOCKS.

b) GROUPS.

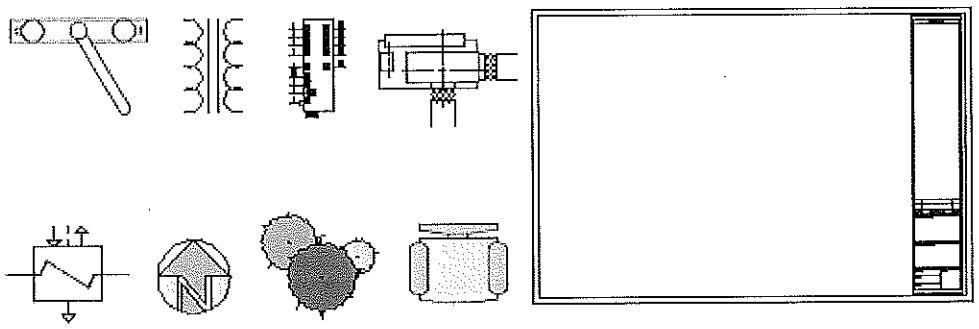
c) ATTRIBUTES.

Answer:

a. Blocks:

Insert symbols and details into your drawings from commercial online sources or from your own designs.

In AutoCAD, a *block* is a collection of objects that are combined into a single named object. The following are some sample blocks at various scales.



Create a Block Definition

Instead of creating a drawing file to be inserted as a block, you might want to create a block definition directly in your current drawing. Use this method if you do not plan to insert the block into any other drawing. In that case, use the BLOCK command to create the block definition.

b. Groups:

Working with groups Blocks have lots of features, such as allowing you to resize blocks while inserting, make modifications in blocks that are transferred to all its references in the drawing, use blocks from other drawings, and so on.

Creating groups

Group Objects (Unnamed Group)

The fastest way to group objects is to create an unnamed group.

1. Select the objects you want to group.
2. Click Home tab ➢ Groups panel ➢ Group.

The selected objects are grouped together into an unnamed group, which is assigned a default name such as *A1.

Create a Named Group

1. Click Home tab ➢ Groups panel ➢ Group.
2. At the prompt, enter **n** and type a name for the group.
3. Select the objects to group and press Enter.

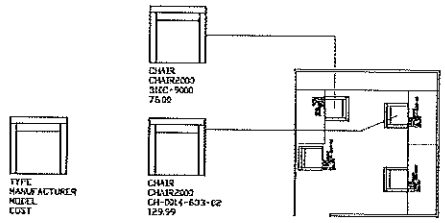
Rename a Group

1. Click Home tab ➢ Groups panel ➢ Group Edit.
2. Select the group you want to rename.
3. At the prompt, enter **ren** (rename).
4. Enter a new name.

c. Attributes:

An attribute is a label or tag that attaches data to a block. Examples of data that might be contained in an attribute are part numbers, prices, comments, and owners' names.

The following illustration shows a "chair" block with four attributes: type, manufacturer, model, and cost. Because the tags were set up as variables, specific information about each instance could be added for each inserted block reference.



Attribute information extracted from a drawing can be used in a spreadsheet or database to produce a parts list or a bill of materials. You can associate more than one attribute with a block, provided that each attribute has a different tag.

When you define an attribute, you specify

- A unique tag that identifies the attribute by name
- A prompt that can be displayed as the block is inserted
- A default value that is used if a variable value is not entered at the prompt

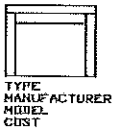
If you plan to extract the attribute information for use in a parts list, you might want to keep a list of the attribute tags you create. You will need this tag information later when you create the attribute template file.

Note: It is important to make sure that attribute tags have unique names. The Enhanced Attribute Editor will display any duplicate tags in red. Duplicate tags will cause problems when extracting data or if you use them in dynamic blocks.

Attach Attributes to Blocks

After you create one or more attribute definitions, you attach them to a block by including them in the selection set when you define or redefine that block.

To use several attributes together, define them and then include them in the same block. For example, you can define attributes tagged "Type," "Manufacturer," "Model," and "Cost," and then include them in a block called CHAIR.



Usually, the order of the attribute prompts is the same as the order in which you selected the attributes when you created the block. However, if you used crossing or window selection to select the attributes, the order of the prompts is the reverse of the order in which you created attributes. You can use the Block Attribute Manager to change the order in which you are prompted for attribute information when you insert the block reference.

When you open a block definition in the Block Editor, you can use the Attribute Order dialog box (BATTORDER command) to change the order in which you are prompted for attribute information when you insert the block reference.

Use Attributes Without Attaching Them to Blocks

Stand-alone attributes can also be created. Once attributes have been defined, and the drawing is saved, this drawing file can be inserted into another drawing. When the drawing is inserted, you are prompted for the attribute values.

Q10. What do you understand by parametric constraints?

Answer:

Parametric drawing can be defined as a technology that is used for designing with constraints. Constraints are defined as restrictions and associations that are applied to 2D geometry. There are two types of constraints: **geometric and dimensional**. Geometric constraints are used to control the relationships of objects in respect to each other. Dimensional constraints are used to control the distance, angle, radius and length values of objects.

A blue cursor icon will always display when you move your cursor over an object that has constraints applied to it. Constraints provide a way to enforce requirements when looking at different designs or when making changes in the design phase of a project. With constraints you can:

- Include formulas and equations within dimensional constraints
- Maintain design requirements and specifications by constraining the geometry within a drawing
- Instantly apply multiple geometric constraints to objects
- Change the value of a variable to make design changes quickly.

Q11. What do you understand by 3D operation in an AutoCAD? Explain about rotating, aligning & mirroring an object in AutoCAD 3D.

Answer:

Three-Dimensional model that displays a picture or item in a form that appears to be physically present with a designated structure. Essentially, it allows items that appeared flat to the human eye to be display in a form that allows for various dimensions to be represented. These dimensions include width, height & depth.

3D Rotate: to rotate 3D objects. By this command you can rotate 3D objects around all three axes (X, Y, Z). 3D rotates depend upon right hand thumb rule.

3D Align: to align two 3D objects to each other. You can specify one, two or three points for the source object. Then, you can specify one, two, or three points for the destination.

3D Mirror: to make mirror copy of 3D objects.