Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

3rd Semester, 2nd In-Sem. Examination

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

Course Code: AUT-1301 **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. Density of cast iron is:

A. 7.45 kg/dm^3

B. 7.35 kg/dm^3

C. 7.25 kg/dm^3

D. 7.30 kg/dm^3

Q 2. What is the technological property of material?

A. Elasticity.

B. Ductility.

C. Electric conductivity.

D. Castability.

Q 3. If a cylinder head has 5 number of valves, then how many of them are inlet valves (IV) and exhaust valves (EV)?

A. 2 IV, 3 EV.

B. 3 IV, 2 EV.

C. 1 IV, 4 EV.

D. None of the above.

Q 4. When engine is running how much oil pressure is indicated by the pressure gauge?

A. 0.2 to 0.4 bar.

B. 0.3 to 0.5 bar.

C. 0.1 to 0.6 bar.

D. 0.3 to 0.6 bar.

Q 5. Vehicle engines usually run at a coolant temperature of:

A. 50 ℃ to 60 ℃
B. 60 ℃ to 70 ℃
C. 70 ℃ to 80 ℃
D. 80 ℃ to 90 ℃

Section – B

03X02 = 06 Marks

Q 6. Calculate the least count of Vernier Caliper by both methods.

Q 7. What is the tensile strength of workpiece, if the tensile force is 3.7 KN and initial section is of 100 mm^2?

Q 8. What are the sensors used in CRDi engines? Explain any two of them.

Section – C

03X03 = 09 Marks

Q 9. Explain the following properties for materials:

a) Physical properties (any two).
b) Technological properties (any two).
c) Chemical properties (any two).

Q 10. What is MPFI engines? Draw the block diagram of MPFI engine including all sensors.

Q 11. Explain the functions and material properties of piston, connecting rod and crankshaft.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills
3rd Semester, 2nd In-Sem. Examination
B. Voc. Program, Summer Semester (2018-19)

Course Code: AUT-1301 **Time: 1 hour**
Course Name: Automotive Power Train **Max. Marks: 20**

ANSWER KEY

Section – A

Q 1. Density of cast iron is:
Answer – C. 7.25 kg/dm^3

Q 2. What is the technological property of material?
Answer – D. Castability.

Q 3. If a cylinder head has 5 number of valves, then how many of them are inlet valves (IV) and exhaust valves (EV)?

Answer – B. 3 IV, 2 EV.

Q 4. When engine is running how much oil pressure is indicated by the pressure gauge?

Answer – D. 0.3 to 0.6 bar.

Q 5. Vehicle engines usually run at a coolant temperature of:
Answer – D. 80°C to 90°C

Section – B

Q 6. Calculate the least count of Vernier Caliper by both methods.

Answer – The total reading of any body is calculated using the formula:

$$TR = MSR + CVD \times LC$$

Where MSR is the main scale division, CVD is the coinciding Vernier division and LC is the least count.

Least count = Least count of main scale/Number of divisions on Vernier scale
Least Count of Vernier calipers = 0.0110cm0.0110cm
= 0.001 cm

Q 7. What is the tensile strength of workpiece, if the tensile force is 3.7 KN and initial section is of 100 mm^2?
Answer – 37 N/mm^2.

Q 8. What are the sensors used in CRDi engines? Explain any two of them.

Answer – Sensors:

- Injection pump speed sensor - monitors pump rotational speed
- Fuel rack position sensor - monitors pump fuel rack position
- Charge air pressure sensor - measures pressure side of the turbocharger
- Fuel pressure sensor

- Air cleaner vacuum pressure sensor
- Engine position sensor
- Temperature sensors - measure various operating temperatures
  - Intake temperature
  - Charge air temperature
  - Coolant temperature
  - Fuel temperature
  - Exhaust temperature (Pyrometer)
  - Ambient temperature
- Vehicle speed sensor - monitors vehicle speed
- Brake pedal sensor - operates with cruise control, exhaust brake, idle control
- Clutch pedal sensor - operates with cruise control, exhaust brake, idle control
- Accelerator pedal sensor
- Driver input switches - cruise control, idle increase /decrease, engine/exhaust brake
- Injector needle movement sensor - monitors the actual injection time and feeds the information to the ECU (as used on VM Motori 2.5 and 3.1 engines)

Section – C

Q 9. Explain the following properties for materials:

a) Physical properties (any two).

b) Technological properties (any two).

c) Chemical properties (any two).

Answer- a) Physical properties:

i. Density (rho): this is determined by the ratio of the mass m to the volume V of a substance.
ii. Ductility: this is the ability of a substance or material to be plastically deformed by external forces without breaking in the process.

b) Technological properties:

i. Castability: a material has good Castability properties if, during melting, it becomes liquid and absorbs hardly any gas, does not shrink excessively when it solidifies.

ii. Machinability: this is the ability of materials to be machined by means of machining/cutting, such as e.g. turning, drilling, grinding.

c) Chemical properties:

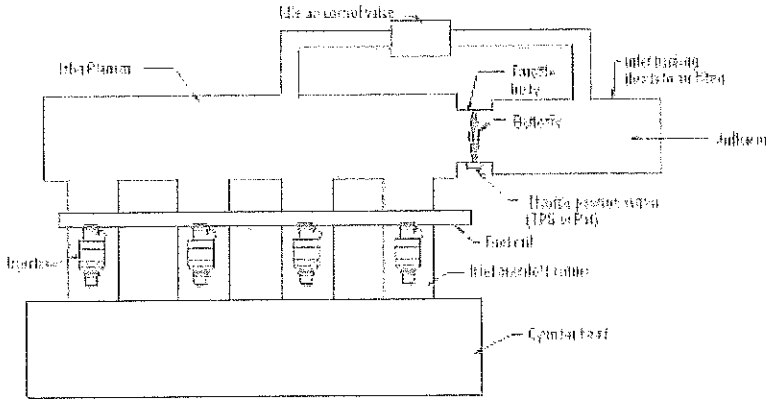
i. Corrosion Resistance: This is the resistance to aggressive media, the influence of which must not result in any measurable changes.

Q 10. What is MPFI engines? Draw the block diagram of MPFI engine including all sensors.
Answer – The MPFI is a system or method of injecting fuel into internal combustion engine through multi ports situated on intake valve of each cylinder. It delivers an exact quantity of fuel in each cylinder at the right time. There are three types of MPFI systems – Batched, Simultaneous and Sequential.

In the batched MPFI system fuel is injected to the groups or batches of the cylinders without bringing their intake stroke together. In the simultaneous system, fuel is inserted to all cylinders at the same time, while the sequential system injection is timed to overlap with intake stroke of each cylinder.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Multiple point injection with pressure



MPFI includes a fuel pressure regulator, fuel injectors, cylinders, pressure spring and a control diaphragm. It uses multiple individual injectors to insert fuel in each cylinder through intake port situated upstream of cylinder's intake value. The fuel pressure regulator, connected to the fuel rail by means of an inlet and outlet, directs the flow of the fuel. While the control diaphragm and pressure spring controls the outlet valve opening and the amount of fuel that can return. The pressure in the intake manifold significantly changes with the engine speed and load.

Q 11. Explain the functions and material properties of piston, connecting rod and crankshaft.
Answer – The connecting rod helps to change the reciprocating motion of a piston into a revolving motion at the crankshaft. Pistons are commonly made of a cast aluminum alloy for excellent and lightweight thermal conductivity. (Thermal conductivity is the ability of a material to conduct and transfer heat).

- A piston is cylindrical in shape and forms the movable portion of the combustion chamber.
- A piston is a component of reciprocating engines, reciprocating pumps, gas compressors, and pneumatic cylinders among other similar mechanisms.
- In an engine, it's purpose is to transfer force from expanding gas in the cylinder to the crankshaft via a piston rod and connecting rod. or
- The force due to this pressure is transmitted to the connecting rod via the piston.
- The below diagram or GIF showed that how the piston works in the cylinder.

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

III Semester, 2nd In-Sem. Examination

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

Course Code: AUT1302 **Time: 1 Hour**

Course Name: Automotive Braking, Suspension & steering **Max. Marks: 20**

Instructions:

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

Section – A

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

Q 1. What is the full form of ABS system?

a) anti-lock braking system
b) anti-lock blocking system
c) auto-lock braking system
d) none of the above

Q 2 What is the main function of shock absorber?

a) reduce speed
b) stability of vehicle
c) support the vehicle weight
d) all of the above

Q 3. What is the full form of ESP?

a) electronic stability program
b) electrical stability program
c) electric steering system
d) none of the above

Q 4. Spring rate in suspension can be expressed as.....

a) $K = \underline{Gd4/8ND3}$
b) $K = \underline{Gd4/8ND^3}$
c) $K = \underline{Gb4/8ND3}$
d) $K = \underline{Gd4+8ND3}$

Q 5. What is the function of coil spring?

a) Carrying load of vehicle
b) Push the vehicle
c) Control skidding
d) Locking of wheel

Section – B

03X02 = 06 Marks

Q 6. Is the Spring Rate Changes in a Vehicle? Explain.

Q 7. Write the functions & purposes of shock absorber.

Q 8. Differentiate between dependent & independent suspension systems.

Section – C

03X03 = 09 Marks

Q 9. Explain dry park test of suspension system.

Q 10. Explain components of braking system.

Q 11. Explain steering pull & tire conicity.

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

III Semester, 2nd In-Sem. Examination

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

Course Code: AUT1302 **Time: 1 Hour**

Course Name: Automotive Braking, Suspension & steering **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 full form of ABS system?

a) anti-lock braking system
b) anti-lock blocking system
c) auto-lock braking system
d) none of the above

Answer: a

Q 2 What is the main function of shock absorber.

a) reduce speed
b) stability of vehicle
c) support the vehicle weight
d) all of the above

Answer: b

Q 3. What is the full form of ESP?

a) electronic stability program
b) electrical stability program
c) electric steering system
d) none of the above

Answer: a

Q 4. Spring rate in suspension can be expressed as.....

a) $K = \underline{Gd4/8ND3}$
b) $K = \underline{Gd4/8ND^3}$
c) $K = \underline{Gb4/8ND3}$
d) $K = \underline{Gd4+8ND3}$

Answer: a

Q 5. What is function of coil spring?

a) Carrying load of vehicle
b) Push the vehicle
c) Control skidding
d) Locking of wheel

Answer: a

Section – B

03X02 = 06 Marks

Q 6. Is the Spring Rate Changes in a Vehicle? Explain.

Answer:

No, the spring rate of a spring does not change, but the spring load can change due to fatigue. The spring rate is the amount of force it takes to compress the spring 1 inch. The spring load is the amount of weight that a spring can support at any given compressed height. When a spring fatigues, the spring's load capacity decreases and the vehicle will sag.

Q 7. Write function & purpose of shock absorber.

Answer:

PURPOSE AND FUNCTION: The major purpose of any shock or strut is to control ride and handling. Standard shock absorbers do not support the weight of a vehicle. The springs support the weight of the vehicle; the shock absorbers control the actions and reactions of the springs. Shock absorbers are also called dampers.

Q 8. Write difference between dependent & independent suspension system.

Answer: Rigid Suspension system: Rigid Suspension system has both right and left wheel attached to the same solid axle.

When one wheel hits a bump in the road, its upward movement causes a slight tilt of the other wheel.

Example: Used for heavy duty vehicles. Construction is simple. Comfort is not great due to low sprung & high unsprung weight. Used in Truck's Front and rear axle both & in Car's Rear Suspension (Mostly Leaf Spring rear suspension).

Independent suspension system: Allows one wheel to move up and down with minimum effect to the other.

Independent suspension system is divided into 2 parts

1) MacPherson Sturt

2) Wish Bone

Section – C

03X03 = 09 Marks

Q 9. Explain dry park test of suspension system.

Answer:

DRY PARK TEST (SUSPENSION): A dry park test can also be used to help locate worn or defective suspension components. The dry park test is performed by having an assistant move the steering wheel side to side while feeling and observing for any free play in the steering or suspension.

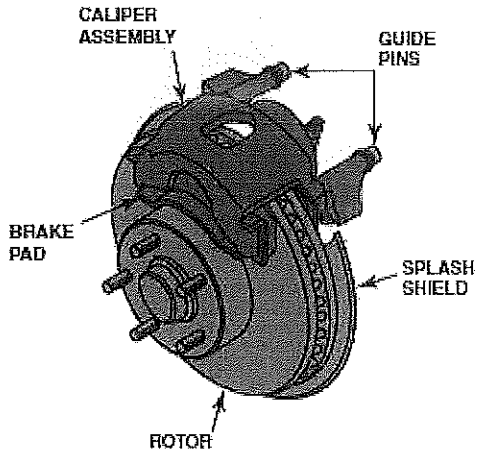
1. Front wheel bearings
2. Control arm bushing wear or movement.
3. Ball joint movement.

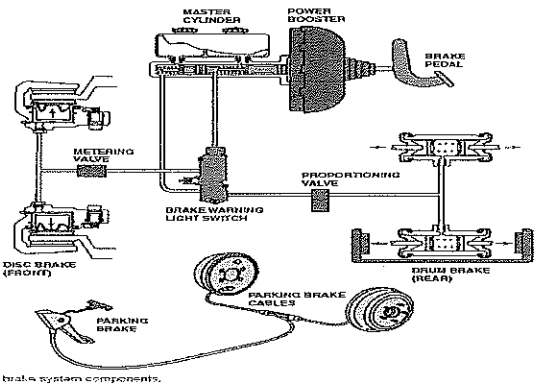
NOTE: The dry park test (and many other chassis system tests) relies on the experience of the technician to be able to judge normal wear from abnormal wear. It is extremely important that all beginning technicians work closely with an experienced technician to gain this knowledge.

Q 10. Explain components of braking system.

Answer:

BRAKE SYSTEM PARTS Most vehicles built since the late 1920s use a brake on each wheel. To stop a wheel, the driver exerts a force on a brake pedal. The force on the brake pedal pressurizes brake fluid in a master cylinder. This hydraulic force (liquid under pressure) is transferred through steel lines and flexible brake lines to a wheel cylinder or caliper at each wheel. Hydraulic pressure to each wheel cylinder or caliper is used to force friction materials against the brake drum or rotor. The friction between the stationary friction material and the rotating drum or rotor (disc) causes the rotating part to slow and eventually stop. Since the wheels are attached to the drums or rotors, the wheels of the vehicles also stop. The heavier the vehicle and the higher the speed, the more heat the brakes have to be able to absorb. Long, steep hills can cause the brakes to overheat which results in the brakes not being able to produce the friction necessary to slow or stop a vehicle. **DRUM BRAKES. Drum brakes** are used on the rear of many rearwheel- drive, front-wheel-drive, and four-wheel-drive vehicles. When drum brakes are applied, brake shoes are moved outward against a rotating brake drum. The wheel studs for the wheels are attached to the drum. When the drum slows and stops, the wheels also slow and stop. Drum brakes are economical to manufacture, service, and repair. Parts for drum brakes are generally readily available and reasonably priced. On some vehicles, an additional drum brake is used as a parking brake on vehicles equipped with rear disc brakes.





12-4 Typical brake system components.

Q 11. Explain steering pull & tire conicity.

Answer:

- Steering Pull: is the tendency of the steering to gradually pull to the right or left when the vehicle is driven straight ahead on a reasonably smooth, straight road.
- Tires of different types, sizes, designs, or inflation pressures on opposite sides of a vehicle cause steering pull.
- Sometimes a tire manufacturing defect occurs in which the belts are wound off centre on the tire. This condition is referred to as tire conicity.
- What is tire conicity?
- Tire conicity is where a properly inflated tire causes a vehicle to pull to the right or left when driven. Tires do not get conicity. They manufacture them with the tendency. It is considered a defect and tire manufacturers cover tire conicity under their warranty, if we diagnose it properly and promptly.

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

3rd Semester, 2nd In-Sem. Examination

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

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

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

1) Square head hammers are used for.....
   a) shrinking metal
   b) Panel flattening
   c) Restoring Bodylines
   d) All of the above
2) A stamping tool is used for .....the dented panel.
   a) Restoring Bodyline
   b) Making Holes
   c) Pulling out dents
   d) Pressing
3) ..... remover is essential for cleaning the surface prior to sanding or spraying undercoats or to coats.
   a) Wax and grease
   b) Putty
   c) Body filler
   d) Seam sealer
4) ..... is a lightweight, extremely strong, and robust material.
   a) Sheet metal
   b) Diamond
   c) Chassis
   d) Fiberglass
5) ..... 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

Section – B

03X02 = 06 Marks

6) What are the advantages and disadvantages of chemical stripping?
7) Where do we use plug weld in a car body?
8) Give the reasons for hammer having serrated faces.

Section – C

03X03 = 09 Marks

9) Discuss the windshield replacement procedures in an automobile.

10) Describe the door skins replacement procedures.

11) Explain a repair situation where body spoon may be used instead of a panel dolly.

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

3rd Semester, 2nd In-Sem. Examination

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

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

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

1) Square head hammers are used for.....

a) shrinking metal
b) Panel flattening
c) Restoring Bodylines
d) All of the above

Ans: - c)

2) A stamping tool is used for .....the dented panel.

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

Ans: - d)

3) ..... remover is essential for cleaning the surface prior to sanding or spraying undercoats or to coats.

a) Wax and grease
b) Putty
c) Body filler
d) Seam sealer

Ans: - a)

4) ..... is a lightweight, extremely strong, and robust material.

a) Sheet metal
b) Diamond
c) Chassis
d) Fiberglass

Ans: - d)

5) ..... 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

Ans: - b)

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Section – B

03X02 = 06 Marks

6) What are the advantages and disadvantages of chemical stripping?

Ans: - The chemical removal of paint and rust can be done at home or you can have it done commercially. The amount of stripping and the availability of a chemical stripper in your area will most likely be the key points to consider when considering this type of work. If you have several parts or a number of large pieces to be stripped, it will be more practical to strip them commercially. If you simply need to strip one or two pieces or just one salvage yard fender, for instance, you can do this yourself.

Chemical stripping doesn't work well on thick plastic body filler, so if you have a panel that you know conditions body filler, remove as much of it as you can before attempt to strip it chemically. This can be accomplished simply using a 36-grit disc on an orbital sander. If thick body filler is not removed before the panel is chemically stripped, the filler will begin to peel but not come off completely. The body filler will prevent the stripper from actually stripping the surface beneath the filler, making the entire process a waste of time.

7) Where do we use plug weld in a car body?

Ans: - After the sales the vehicle may falls into the accident and caused body damage. Most of the body parts are spot welded and we use the plug weld in the area where the spot welding is not applicable or not reachable.

8) Give the reasons for hammer having serrated faces.

Ans: - The hammer having serrated faces use to shrink the sheet metal during dent repair. The serrated face is same as in the file.

Section – C

03X03 = 09 Marks

9) Discuss the windshield replacement procedures in an automobile.

Ans: -

- There are basically two types of windows in an automobile: fixed glass and opening glass. Fixed glass is used in windows that do not open, such as the windshield, back window, and rear quarter windows.
- Glass from fixed windows is taken out by first removing any trim around the window seal, removing the rubber by using a special tool designed for the task, then pushing the window glass outward. Any residual window caulk or sealant must be removed from the sheet metal around the window opening. Some of these windows are glued in place, while others are held in place by rubber weather strip. For the type that is glued in place, the sheet metal window opening must be free or debris or broken glass and clean and free of contaminants; this can be ensure by cleaning with wax and grease remover, then applying the glue to the flange in the windows opening.

10) Describe the door skins replacement procedures.

Ans: -

Since automobile doors consist of two basic components- a mostly hollow inner panel and an outer skin- some door repairs can be made by simply re-skinning the door. Before you attempt these repairs, consider the following:

- First and foremost, this repair will be beneficial only if the original inner panel is still undamaged (or at least straight). If the collision impact cause damage to the inner panel, which cannot be easy repaired, you should consider finding a replacement door. Likewise, if the outer skin is damaged due to rust, you should verify that the inner panel is still structurally round. It may be usable, but it might be actually being in worse shape than the outer skin.
- If the inner panel is still usable, you should determine if an outer skin is available for your vehicle's make and model. If it is, you are in luck, as a door skin will be considerably less expensive than replacement door. Of course, if this is your daily driver, you may choose to replace the entire door while you're at it.
- If you decide to replace the door skin, the following steps should be taken. First remove the door from the vehicle, the internal components from the inside of the door, and then set the door atop a pair of sawhorses or other suitable work stand.
- The original door is secured by the edges wrapping around the flange of the inner door panel. To remove it, use a grinder along with the edge of door to separate the main part of the door skin from the part that flaps over. When this is completed, you should be able to remove the skin. If it can't be removed, there may be spot welds around the flange that must be drilled out. Once you have done this, you should have able to remove the part that flaps over from the inside of the inner door panel.
- To install a new skin, first double-check to make sure that no fragments of the previous door skin, any spot welds, or panel adhesive remain on the surface to which the new skin will be applied. Then positioned the new skin so that the excess "skin" is centered front to back and to top to bottom. Using a permanent marker or a scribe, make some positioning reference marks on the inside of the door skin so that it can be placed in this position again. Then remove the door skin, apply a bead of panel adhesive to get slightly tacky, then press the door skin into position. Use clamp to secure the door skin in place. You can use C-clamp, clamping pliers (vise-grips), or other types of clamps. However, be sure to take appropriate precautions to avoid damaging the new door skin or inner panel. After the two panels are clamped togethe wipe away any excess panel adhesive that oozes from inside the door.
- After the panel adhesive has set (refer to the product label for the time this will take), the edges of the door skin still need to be folded over the edge of the inner door panel. There are several ways to do this and even more tool available to do it. Some body men use door-skinning pliers to fold the edge over, while others are duckbill locking pliers. After the edge is folded over somewhat, it must be pressed down flat against the inside of the door panel. Some use a light door-skinning hammer, while others use mallet or a smooth-faced body hammer and a dolly. This is one of those cases where there are several ways to perform the same task, depending on what tools you have available and how they are use them. The main this to remember is that the edge of the door skin must be flat against the inner panel, but you don't want to do any damage to the outer side.

11) Explain a repair situation where body spoon may be used instead of a panel dolly.

Ans: -

- Designed for used inside hard-to-reach areas.
- Spoons function like a body dolly with a handle.
- Often smaller and thinner than a dolly, they can be used inside of doors, fenders, hoods, or other double wall panels.
- They can also be used for prying panels outward from behind.

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

3rd Semester, 2nd In-Sem. Examination

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

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

Course Name: Automotive Refinish Painting **Max. Marks: 20**

Instruction: 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. What does 1-k represent ?

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

Q-2. We always start the formulation of color with.....

a. Binder
b. Hardener
c. Tinter
d. None of the above

Q-3. What is the role of flexible additive?

a. Increases flexibility of paint
b. Increases flexibility of plastic
c. Reduces flexibility of paint
d. None of the above

Q-4. Wash primer is a.....primer?

a. 1k
b. 2k
c. Both (a) and (b)
d. None of the above

Q-5. How much hardener is mix in 100 gm of polyester putty?

a. 100:5 gm
b. 100:20 gm
c. 100:2 gm
d. None of the above

Section – B

03X02 = 06 Marks

Q-6. What is Metamerism?

Q-7. What are the factors involved in colour matching?

Q-8. What is the difference between body filler and putty?

Section – C

03X03 = 09 Marks

Q-9. Explain Hue, Value and Chroma.

Q-10. Explain the different types of angles used for inspection of panels.

Q-11. Explain shade card used during formulation of colour.

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

3rd Semester, 2nd In-Sem. Examination

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

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

Course Name: Automotive Refinish Painting **Max. Marks: 20**

Instruction: 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. What does 1-k represent?

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

Ans Product with hardener

Q-2. We always start the formulation of color with.....

a. Binder
b. Hardener
c. Tinter
d. None of the above

Ans Binder

Q-3. What is the role of flexible additive?

a. Increases flexibility of paint
b. Increases flexibility of plastic
c. Reduces flexibility of paint
d. None of the above

Ans Increases flexibility of paint

Q-4. Wash primer is a.....primer?

a. 1k
b. 2k
c. Both (a) and (b)
d. None of the above

Ans 1k

Q-5. How much hardener is mix in 100 gm of polyester putty?

a. 100:5 gm
b. 100:20 gm
c. 100:2 gm
d. None of the above

Ans 100:2 gm

Section – B

03X02 = 06 Marks

Q-6. What is Metamerism?

Ans Metamerism is the change of colour influenced by another light source (esp. during darkness).

Metamerism can be avoided by adjusting colors with their "proper" tinting's.

Q-7. What are the factors involved in colour matching?

- Ans:- Environment- Temperature,weather and air velocity
- Product- Hardener and thinner
- Application- Distance , overlapping etc.
- Equipment- Spray gun , compressor etc

Q-8. 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.

Section – C

03X03 = 09 Marks

Q-9. Explain Hue, Value and Chroma.

Ans Hue: - Hue is the most important property of colour as it simply described by simply names of colour. Colour names like red, blue, yellow etc. all are hue names.

Value: - The attribute with which we can classify color on the basis of their lightness and darkness is called value.

Chroma: - The attribute with which we can classify color on the basis of their Brightness and dullness is called Chroma.

Q-10. Explain the different types of angles used for inspection of panels.

Ans

- Environment- Temperature,weather and air velocity
- Product- Hardener and thinner
- Application- Distance , overlapping etc.
- Equipment- Spray gun , compressor etc.

Q-11. Explain shade card used during formulation of colour.

Ans Shade cards are used during the colour matching of car and then we can also prepare the colour by using the data provided on shade card.
Shade cards are available with every paint manufacturer and we ca formulate every colour with the help of shade cards.
Shade cards have the details of amount of binder and tinter which has to be mixed for the given shade and we can mix that amount of tinter with the help of weighing balance.

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Automotive Skills

3rd Semester, 2nd In-Sem. Examination

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

Course Code: AUT 1305 **Time: 1 Hour**

Course Name: Automotive electrical and air conditioning **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. How much current is required for the ignition in vehicle?

A. Approx. 2 amperes.
B. Approx. 3 amperes.
C. Approx. 2.5 amperes.
D. none of above.

Q 2. Speed of the alternator in comparison to engine speed is?

A. 2-3 times.
B. 3-4 times.
C. Both A & B.
D. Same as engine speed.

Q 3. Induction current is taken from which part:

A. Stator.
B. Rotor.
C. Armature.
D. All of the above.

Q 4. Alternator produces which voltage?

A. Constant DC.
B. A.C. voltage.
C. Pulsating DC voltage.
D. Both B & C.

Q 5. Partial current is taken from each phase and rectified by:

A. Stator.
B. P-N diodes.
C. Exciter windings.
D. None of the above.

Section – B

03X02 = 06 Marks

Q 6. What are the components of three phase generator? Describe in brief?

Q 7. Why do we use diodes in the alternator?

Q 8. Write down the name of parts of the alternator.

Section – C

03X03 = 09 Marks

Q 9. Describe one-way rectification, bridge rectification and full wave rectification with diagrams.

Q 10. Draw a circuit diagram of charging circuit.

Q 11. Why do we use excitation windings in alternator?

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Question Paper

School of Automotive Skills

3rd Semester, 2nd In-Sem. Examination

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Course Name: Automotive electrical and air conditioning **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. How much current is required for the ignition in vehicle?

Answer: Approx. 2 ampere

Q 2. Speed of the alternator in comparison to engine speed is?

Answer: 2-3 times.

Q 3. Induction current is taken from which part

Answer: stator

Q 4. Alternator produces which voltage?

Answer: A.C. voltage.

Q 5. Partial current is taken from each phase and rectified by...

Answer: None of the above.

Section – B

03X02 = 06 Marks

Q 6. What are the components of three phase generator?

Answer:

1. fan prop

2. drive end shield
3. stator, stand
4. field winding
5. rotor
6. slip ring bearing shield
7. diode plate
8. slip rings
9. control

Q 7. Why we use diodes in the alternator?

Answer: diodes are used for rectification of positive or negative waves of the electrical signal. It works as a filter for the electrical signals

Q 8. Write the parts name of the alternator.

Answer:

1. fan prop
2. drive end shield
3. stator, stand
4. field winding
5. rotor
6. slip ring bearing shield
7. diode plate
8. slip rings
9. control

Section – C

03X03 = 09 Marks

Q 9. Describe one-way rectification, bridge rectification and full wave rectification with diagram.

Answer:

a) one-way rectification

This circuit is used for rectifying single-phase alternating current. The induced current can only flow in one direction because of the diode. This means that only half the wave of alternating current is used. The second half-wave is suppressed (locked).

b) Bridge rectification (Graetz circuit)

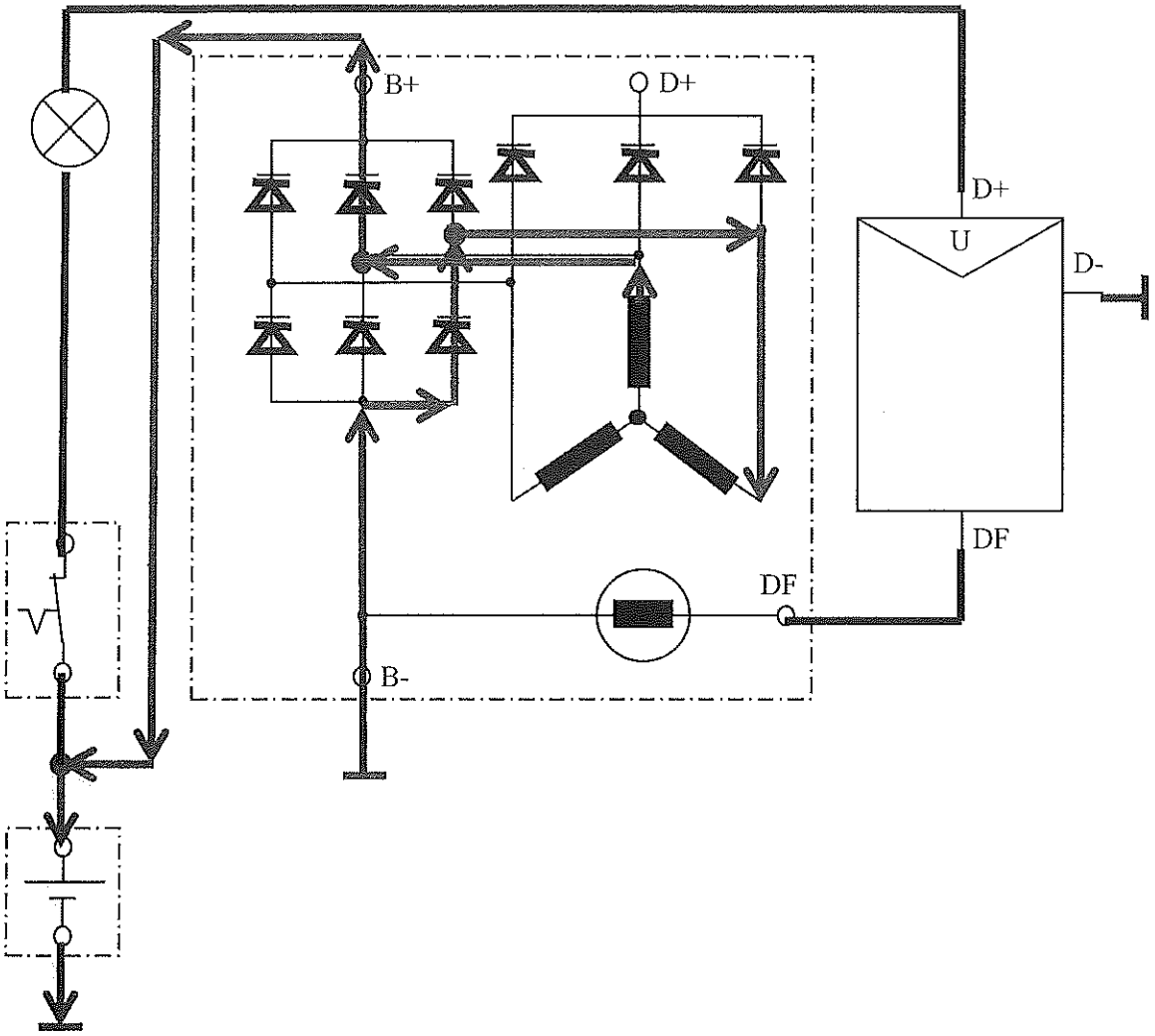
In this circuit there are two diodes for each pole conductor. The negative Half waves can thus be routed to the positive output of the circuit. This means that both half-waves of the alternating current. This circuit is used in most alternators are used.

Mandatory

c) Full-wave rectification (bridge rectification) For bridge rectification, the star point is normally not led out. The return is via the negative diodes and the other phases

Q 10. Draw the circuit diagram of charging circuit?

Answer:



Q 11. Why we use excitation windings in alternator?

Answer:

At low speed, the residual magnetism usually undersized is that the generator can excite itself. This is because the voltage generated by the residual magnetism by induction is too low to reach the threshold voltage of the two diodes connected in series 1.4 v

So that the generator starts charging immediately after the engine has been started, even when idling, it must be started with external voltage pre-excited (separate excitation). The pre-excitation current flows from the battery+ via the switched on ignition switch, the charging control lamp, for connection D+ to the regulator, through the regulator to connection DF and through the excitation winding (rotor) of the generator to ground and to the battery