THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23 (SUMMER SEMESTER)			
B.Voc/M.Voc	**M. VOC**	**Semester**	1st
Course name / Module	AUTOMOTIVE SAFETY AND COMFORT SYSTEM		
Course code	AUT2107		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS

- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.
-

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

1. A passive safety system is there to:
   a. Avoid an accident from happening
   b. Protect and limit injury during an accident
   c. Passively do nothing during an accident
   d. Protect the car from damage.
2. An example of passive safety system is:
   a. Parking assist sensors
   b. ABS
   c. Crumple zone
   d. Adaptive cruise control
3. An example of active safety system is:
   a. Crumple zone
   b. Air bags
   c. Energy absorbing bumpers
   d. Park assist sensors
4. If a car system tries to prevent or avoid an accident from happening, what type of system is it called?
   a. Passive
   b. Response
   c. Inactive
   d. Active
5. What are the elements that contribute to vehicle skidding?
   a. The age of the vehicle
   b. Road visibility conditions
   c. Every elements that prevents direct contact between the tire and the roadway

d. Any element which affects the driver alertness.

2. Section B (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

1. Explain ABS system with neat sketch.
2. Explain crumble zone with sketch.
3. Explain traction control system.

3. Section C (03 long type questions, each question carries 03 marks)	**03×03 = 09**

1. Draw VCRS cycle used in automotive AC system with neat sketch.
2. Write various active safety system and passive safety system.
3. Explain electronic brake force distribution with neat sketch.

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23(SUMMER SEMESTER)			
B.Voc	**Semester**	5th	
Course name / Module	Paint Shop Management		
Course code	AUT1504		
Date	___ **Oct - 2022**		
Name of the Student		**Reg. No.**	

INSTRUCTIONS
• Maximum Marks: **20**
• Duration of Examination: **01 Hour**
• Attempt all questions.

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

Q. 1 What are the three things we need during color matching?

a. Sunlight, Object, Eye
b. Paint, hardener, clear
c. Plastic primer, Flexible additive, thinner
d. None of the mention

Q.2 Painter A says, mixing room must have flash proof lights.
Painter B Says, flash proof light is not mandatory for paint mixing room.
Who is correct?

a. Painter A
b. Painter B
c. Both (a) & (b)
d. None of the mentioned

Q. 3 Volatile Organic Compounds are found in:

a. Paint
b. Thinner
c. Catalyst and hardener
d. All of the above

Q.4 What is meaning of VOC?

a. Volatile organic compound
b. Volatile organic complaint
c. Volatile organic class
d. None of the mentiond

Q.5 The best light for color matching?

a. Natural day light
b. Fluorescent light
c. Sodium light
d. None of the mentioned

2. Section B (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

Q.6 What is transfer efficiency? How it can be calculated?

Q.7 Brief about the following:

a. Pot life
b. Shelf life

Q.8 Describe about different type of spray guns on the basis of paint supply method.

3. Section C (03 long type questions, each question carries 03 marks)	**03×03 = 09**

Q.9 What is colour matching, also write manual paint mixing procedure.

Q.10 Explain colour matching techniques.

Q.11 Write the factors which effect the transfer efficiency of a spray gun?

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23(SUMMER SEMESTER)			
B.Voc/M.Voc	**M.Voc**	**Semester**	1st
Course name / Module	Automotive Vehicle Service		
Course code	AUT2102		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS

- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

Q1.Which among the below is not a component of Steering System?

a. Tie-Rod
b. Lower Arm
c. Steering Gear
d. Steering Shaft

Q2._____ component in a steering system is responsible for setting the toe-in angle
a.Steering column
b.Steering gearbox
c.Tie-rods
d.Steering pump

Q3.Steering pumps are connected to _____
a.Crankshaft
b.Cam shaft
c.Electric motor
d.Hydraulic pump

Q4.Which of the following not a benefit of using a power steering?
a.More efficient
b.Less physical effort
c.Low maintenance
d.Both b & c

Q5.Which of the following not a benefit of using a power steering?

e. More efficient
f. Less physical effort
g. Low maintenance
h. Both b & c

2. Section B (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

Q6.What do you understand by tire rotation?
Q7.Explain Toe-in and camber angle
Q8.Why wheel balancing is needed.

3. Section C (03 long type questions, each question carries 03 marks)	**03×03 = 09**

Q9.Derive the relation for the necessary condition of correct steering
Q10.Explain the working of the rack and pinion steering System
Q11.Explain the procedure of wheel Alignment

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23(SUMMER SEMESTER)			
B.Voc/M.Voc	**B.Voc**	**Semester**	3rd
Course name / Module	Automotive Power Train-II		
Course code	AUT1301		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS

- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

Q1. The pipe which connects the intake system to the inlet valve of the engine and through which air or air-fuel mixture is drawn into the cylinder is known as _____

a)SparkPlug

b)Connecting-Rod

c)Camshaft

d) Inlet Manifold

Q2. The end of the connecting rod which fits over the gudgeon pin is known as _____ connecting rod.

a)Small-end

b)Big-end

c)Piston

d) Cylinder block

Q3.What is the firing order of a four-cylinder engine?

a)1-3-4-2

b)1-4-3-2

c)1-2-3-4

d) 4-3-2-1

Q4. The ratio of the actual weight of air induced by the engine in the intake stroke to the theoretical weight of the air that should have been induced due to piston displacement at intake temperature and pressure is known as _____

a)Efficiency-ratio

b)Volumetric-efficiency

c)Mechanical-efficiency

d) Indicated thermal efficiency

Q5. What is the compression ratio in SI engines?

a)6–10

b)3–5

c)1–2

d) 11 – 15

2. **Section B** (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

Q6. Explain the function of the Piston

Q7.Why valve clearance is provided in IC Engine

Q8.Write the sequence of valve train of OHC Engine

3. **Section C** (03 long type questions, each question carries 03 marks)	**03×03 = 09**

Q9.What is a firing order? Why firing order is provided?

Q10.Explain the working of Four stroke diesel engine.

Q11.Write the procedure of inspecting the piston ring and piston

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23(SUMMER SEMESTER)			
B.Voc/M.Voc	**B.Voc**	**Semester**	3rd
Course name / Module	Basics of AutoCAD and Solid works		
Course code	GEN1308		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS
• Maximum Marks: **20**
• Duration of Examination: **01 Hour**
• Attempt all questions.
• Any other instruction may be included, If required.

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

Q1. When drawing in 2D, what axis do you not work with?

a) X
b) Y
c) Z
d) None of the above

Q2. Which command covert discrete objects in polyline.

a) Union
b) Polyline
c) Join
d) None of the above

Q3. Fillet command can be used to obtain

a) chamfer corners
b) Round corners
c) Both of the above
d) None of the above

Q4. Scaling objects make them

a) Smaller
b) Bigger
c) Either smaller or bigger
d) None of the above

Q5. Which of the following file extensions cannot be open in Auto CAD.

a) .dwg
b) .dot
c) .dxf
d) .dws

2. **Section B** (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

Q6. What is the use of the MIRROR command?

Q7. What is an object snap mode?

Q8. What is the meaning of the array command?

3. **Section C** (03 long type questions, each question carries 03 marks)	**03×03 = 09**

Q9. Write brief introduction about Auto CAD and system requirement to run its latest version.

Q10. Write advantages and disadvantages of Auto CAD.

Q11. Write any six shortcut keys with their use for different 2D commands you used in Auto CAD that saves your time.

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23(SUMMER SEMESTER)			
B.Voc/M.Voc	**M.Voc**	**Semester**	1st
Course name / Module	Elements of Automotive Engineering		
Course code	AUT2101		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS

- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.
- Assume suitable data if required

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

Q1.In a diesel engine, the fuel is injected by.....

A.Spark

B.Injected fuel

C.Ignitor

D.Heat resulting from compression air that is supplied from combustion

Q2.The compression ratio of the I.C. engine is.....

A.The ratio of volumes of air in the cylinder before compression stroke and after compression ratio

B.Volume displaced by piston per stroke and clearance volume in the cylinder

C.Ratio of pressure after compression and before compression

D.None of the above

Q3.A theoretically correct mixture of air and petrol is .....

A.10:1

B.15:1

C.20:1

D.25:1

Q4.In a four-stroke engine, the working cycle is completed in.....

A.One revolution of the crankshaft

B.Two revolutions of the crankshaft

C.Three revolutions of the crankshaft

D.Four revolutions of the crankshaft

Q5.The power developed by the engine cylinder of an I.C. engine is known as.....

A.Indicated power

B.Break power

C.Actual power

D.None of the above

2. Section B (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

Q6.Draw PV and T-S Diagram for Carnot cycle
Q7.Why MPFI technology is used in current IC Engines
Q8.Define any three performance parameters of IC Engine

3. Section C (03 long type questions, each question carries 03 marks)	**03×03 = 09**

Q9. Derive the relation for efficiency for Otto Cycle
Q10.Explain the working of a four-stroke diesel engine with a suitable diagram
Q11. An ideal air-standard Otto cycle engine has a compression ratio of 8. At the beginning of the compression process, the working fluid is at 100 kPa, 27°C (300 K), and 800 kJ/kg heat is supplied during the constant volume heat addition process. Neatly sketch the pressure-volume [*P-v*] diagram for this cycle, and using the specific heat values for air at a typical average cycle temperature of 900K determine:
a) the temperature and pressure of the air at the end of each process
b) the network output/cycle [kj/kg], and
c) the thermal efficiency [η_{th}] of this engine cycle.

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THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23 (SUMMER SEMESTER)			
B.Voc/M.Voc	**B.VOC**	**Semester**	3rd
Course name	AUTOMOTIVE BODY WORKS		
Course code	AUT 1303		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS

- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.
-

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

Q1. ..... is a lightweight, extremely strong, and robust material.

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

Q2. ..... 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 seal

Q3. The gap between the electrode rod and the work piece should be about .....

a) The electrode diameter
b) The work piece thickness
c) 5 mm
d) the core wire diameter

Q4. .....is used to prevent moister from getting into seams of a car.

a) Degreaser
b) Putty
c) Body filler
d) Seam sealer

Q5. ..... 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) Nibbler

2. Section B (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

Q6. Explain the different categories of body filler used in workshop.

Q7. Write the names of different tools used in auto bodywork.

Q8. What are the advantages of using sanding blocks during dry sanding?

3. Section C (03 long type questions, each question carries 03 marks)	**03×03 = 09**

Q9. Write short notes on:

a) Epoxy Primer

b) Sand paper

Q10. Write tips and tricks to apply body filler.

Q11. Write short note on fiberglass and its applications.

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23 (SUMMER SEMESTER)			
B. Voc.	**Semester**	5th	
Course Name	Automotive Electrical System		
Course Code	AUT1502		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS

- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

1. Air consists of.....
    a. only Oxygen.
    b. Oxygen and CO2.
    c. mostly NOx and Oxygen.
    d. 78% Nitrogen, 21% Oxygen.
2. The two most important information for the fuel injection are.....
    a. temperature and load.
    b. load and rpm.
    c. fuel pressure and rpm.
    d. voltage and load.
3. A sensor.....
    a. receives orders from ECU.
    b. sends information to ECU.
    c. needs always 12 volts.
    d. sends orders to ECU.
4. What belongs to the MOST?
    a. Catalytic converter, Audio.
    b. Internet, Media, Graphics.
    c. OBD, ABS.
    d. The starter motor.
5. Current for a starter motor is about.....
    a. 350 A.
    b. 240 V.
    c. 1.75 A.
    d. 60 Ah.

2. Section B (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

1. What do you understand by an oscilloscope? Describe the use of oscilloscope in basic electrical measurements.
2. Name & briefly describe different types of pressure testing in a vehicle.
3. Give reason for what to check in an electric starter motor if it is not starting and creating a sound of clac...clac...clac.

3. Section C (03 long type questions, each question carries 03 marks)	**03×03 = 09**

1. Explain MOST (Media Oriented System Transport).
2. Describe the optimal system approach to the electrical fault diagnosis in a vehicle.
3. Explain the followings:
    a. Automotive Ethernet.
    b. Multiplexing.
    c. Emission Testing.

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23(SUMMER SEMESTER)			
B.Voc/M.Voc	**B.Voc**	**Semester**	5th
Course name / Module	Workshop Management		
Course code	AUT1503		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS

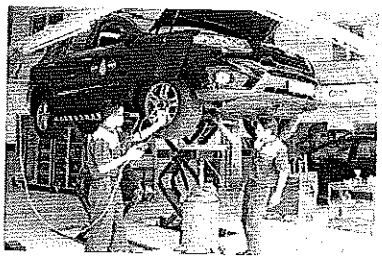
- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.

1. Section A (05 objective type questions, each question carries 01 mark) **05×1 = 05**

Q1.Who among below is the face of the Dealership for Customers?

a. Technician
b. Works Manager
c. Warranty In charge
d. Service Advisor

Q2.Identify the picture below:



a) Accident Repair Bay
b) Washing Bay
c) Quick Service Bay
d) PDI Bay

Q3.Arranging the necessary Items in place for easy access

a) SEIRI
b) SEITON
c) SEISO
d) SAIKETSU

Q4. What must you do when tidying up in the workshop?

a) Hang up the aprons correctly on the stand
b) Put the tools away in their places on the shadow board
c) Sweep up the dust on the floor
d) All of the above

Q5.Which is the best description of kaizen?

a) A slow process of continuous improvement
b) A quick process of continuous improvement
c) A process to re-engineer all company processes
d) A process to have outside consultants implement improved methods of production

2. Section B (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

Q6.Write the responsibilities and duties of the technician.
Q7. What is KAIZEN?
Q8.What are the various safety measures in the Automobile workshop

3. Section C (03 long type questions, each question carries 03 marks)	**03×03 = 09**

Q9. Explain ABC Analysis
Q10.Explain 5S Technique
Q11.Write the functions of the Workshop Manager

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23(SUMMER SEMESTER)			
B.Voc/M.Voc	**B.Voc** **Semester**	3rd	
Course name / Module	Automotive Refinish Painting		
Course code	AUT1304		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS

- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.
- Marks will be deducted if over writing is found in answer copy.

1. Section A (05 objective type questions, each question carries 01 mark) **05×1 = 05**

Q-1. What does 1-k represent?

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

Q-2. What defines the chroma of color

a. Brightness and dullness
b. Lightness and Darkness
c. Hue
d. None of the above

Q-3. What grade of sanding disc is used to remove Dual action sanding marks on bare metal?

a. P320
b. P120
c. P80
d. None of the above

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

a. Anti-Rust Coat
b. Adhesion promoter
c. Both (a) and (b)
d. None of the above

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

a. 100:2
b. 100:20
c. Depends on manufacturer
d. None of the above

2. **Section B** (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

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

Q-7. What are the difference between scuffing and sanding?

Q-8. What is the difference between Value and Chroma?

3. **Section C** (03 long type questions, each question carries 03 marks)	**03×03 = 09**

Q-9. Draw Color Sphere and define Hue, Value and Chroma.

Q-10. Write down the Steps for Standard Repair Process.

Q-11. Write the names of Primary and Secondary Color According to hue circle diagram.

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THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23 (SUMMER SEMESTER)			
B.Voc/M.Voc	**M. Voc** **Semester**	1st	
Course name	AUTOMOTIVE BODY REPAIRS		
Course code	AUT2103		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS

- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.
-

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

1. The color code of a warning sign is:

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

2. Which of the following options is not a body panel?

   a. Door
   c. Wheel
   b. Fender
   d. Bumper

3. The total number of Body Panel in a vehicle are: -

   a. 10
   c. 12
   b. 20
   d. 13

4. Which of the following options is a safety equipment?

   a. Shoes
   c. Goggles
   b. Gloves
   d. All of the above

5. What is the color code of a prohibition sign?

   a. Red
   c. Black
   b. Yellow
   d. Blue

2. Section B (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

1. Define auto body repairs
2. Write down different car body styles.
3. Name the different body parts of cars (Volkswagen, Honda) you found in the workshop and also write how many pillars it have?

3. Section C (03 long type questions, each question carries 03 marks)	**03×03 = 09**

1. Write down the tools and equipment used in auto body repairs.
2. Write down different car body section and explain all of them.
3. Define chassis of an automobile write down different types of chassis used in automobile.

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23 (SUMMER SEMESTER)			
B.Voc/M.Voc	**M. VOC** **Semester**	1st	
Course name	AUTOMOTIVE ELECTRICALS		
Course code	AUT2105		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS

- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

1. The capacity of 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. The output of an automobile alternator is controlled by:
   (a) Voltage regulator
   (b) Cut-out relay
   (c) Current regulator
   (d) None of these

5. Allow the current to flow from the alternator to the battery but not in the opposite direction by the use of:
   (a) Diode
   (b) Triode
   (c) Capacitor
   (d) Insulator

2. Section B (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

1. The charging and discharging of vehicle battery done through which electrical components? Name them.
2. Explain alternator function and working of an alternator.
3. Explain no charge, over charge and under charge condition of charging system.

3. Section C (03 long type questions, each question carries 03 marks)	**03×03 = 09**

1. Explain principal of operation, working and chemical reaction of lead acid battery.
2. Explain faraday law of electromagnetic induction and its application automotive.
3. Write down the needs of a charging system in automotive vehicle also write down charging sysyem components.

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23 (SUMMER SEMESTER)			
B.Voc/M.Voc	**B. VOC**	**Semester**	3rd-----
Course name	AUTOMOTIVE ELECTRICAL & A.C.		
Course code	AUT1305		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS

- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

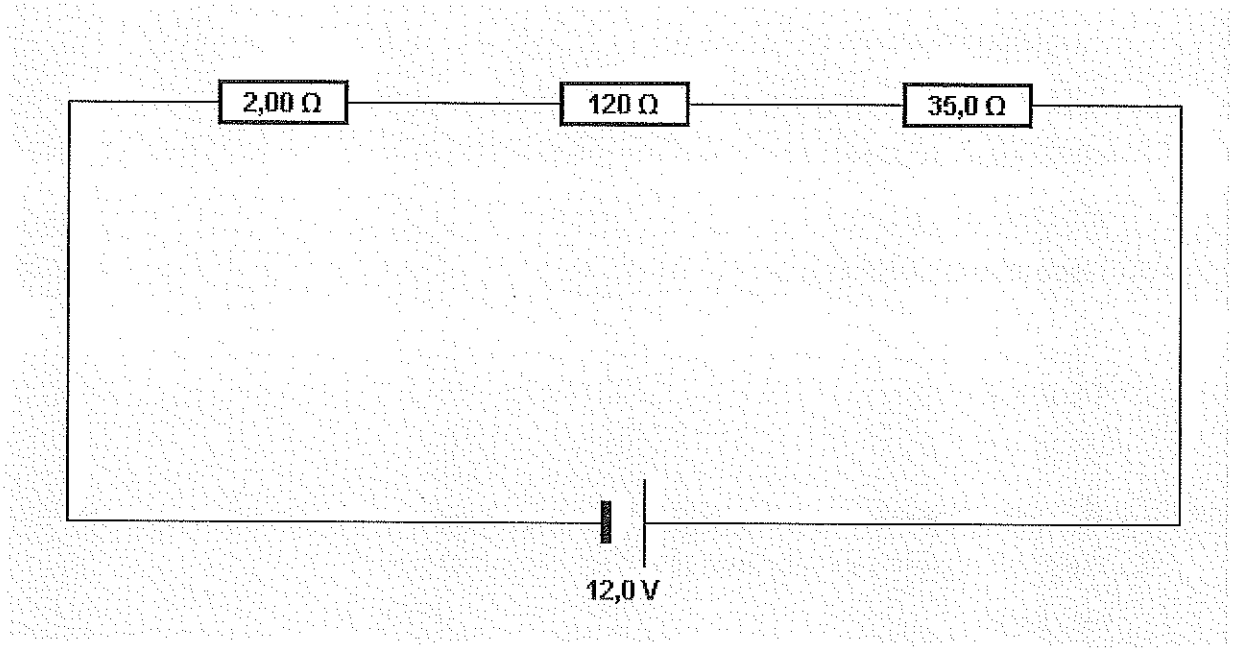
1. Ohm's law is applicable to:
   a) Semiconductors
   b) Vacuum tubes
   c) Carbon resistors
   d) None of these
2. Correct form of ohm's law:
   a) I = VR
   b) V ∝ I
   c) V = IR
   d) Above B and C
3. Electrical current can only flow in_____electric circuit.
   (A) closed (B) Open
   (C) Both A and B (D) None of these
4. Direction of magnetic field lines inside the magnet:
   (A) North pole to South pole (B) South pole to north pole
   (C) Both A and B (D) None of these
5. 1 microvolt is equal to:
   a) 1×10^{-3} V
   b) 1×10^{-4} V
   c) 1×10^{-5} V
   d) 1×10^{-6} V

2. **Section B** (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

1. Explain Ohms Law with neat sketch.
2. Draw series and parallel connection of circuit through 12-volt battery?
3. Define electricity and differentiate between AC and DC voltage/current.

3. **Section C** (03 long type questions, each question carries 03 marks)	**03×03 = 09**

1. Explain structure of atom.
2. Draw various electrical symbols.
3. Calculate total resistance, total current and voltage consumption in R1, R2 and R3 of below figure arrangement: R1= 350 ohm, R2= 120 ohm, R3= 200 ohm, voltage = 12 volt.



THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23(SUMMER SEMESTER)			
B.Voc/M.Voc	**B.Voc**	**Semester**	5th
Course name / Module	Automotive Mechatronics System		
Course code	AUT1501		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS
• Maximum Marks: **20**
• Duration of Examination: **01 Hour**
• Attempt all questions.

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

Q1.Which of the below is not a function of the Engine Management System?

a. Maximum Engine Power & Performance
b. Maximum Braking Performance
c. Lowest Exhaust Emissions
d. Lowest Fuel Consumption

Q2.The Engine Functions are controlled by_____

a) TCM
b) BCM
c) ECU
d) ICU

Q3.The Function of a Sensor is _____

a) To control the component
b) To give output signal to ECU
c) To give ground signal to Component
d) To give input signal to ECU

Q4.Hall effect sensors are employed as :

a) CKP sensor
b) Camshaft Position sensor
c) Oxygen Sensor
d) Both a & b

Q5.A change in the electrical resistivity of a semiconductor or metal when a mechanical strain is applied is described as :

a) Piezo - electric
b) Piezo - resistive
c) Inductive
d) None of the above

2. **Section B** (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

Q6.What is the purpose of the Engine Management System?

Q7.Give the classification of Sensors

Q8.What is the difference between a Mechanical and Mechatronics System?

3. **Section C** (03 long type questions, each question carries 03 marks)	**03×03 = 09**

Q9.Explain the engine Management system used in IC Engine

Q10.Explain ECU along with its Functions

Q11.What do you understand by open loop and closed loop systems? Explain with the help of a Block diagram.

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23 (SUMMER SEMESTER)			
B. Voc.	**Semester**	3rd	
Course Name	Automotive Braking, Suspension and Steering System		
Course Code	AUT1302		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS

- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.
-

1. Section A (05 objective type questions, each question carries 01 mark) **05×1 = 05**

1. What is TWI stands for?

a) Tire wear indicator
b) Tread value indicator
c) Tread wear indicator
d) None of the above

2. Which one of the following sensors in the electronic steering system is used to change the output to the steering motor as per real-time conditions?

a) Steering angle sensor
b) Torque sensor
c) Vehicle speed sensor
d) All of the mentioned

3. Which one of these is not part of the hydraulic steering system?

a) Hydraulic Pump
b) Electric Motor
c) Steering wheel
d) Rack and pinion

4 If a person turns the steering wheel 450 degrees then how much should the wheel turns while having a steering ratio of 40:4?

a) 11 degrees
b) 120 degrees
c) 45 degrees
d) None of the above

5. Which of the following steering system works on the turning and sliding mechanism?

a) Ackermann
b) a & b
c) Davis
d) None of the above

2. **Section B** (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

1. Write down the name of components in a hydraulic electirc steering system?
2. What do you understand by sliding and turning pair?
3. Write down the major fucntions of a tyre.

3. **Section C** (03 long type questions, each question carries 03 marks)	**03×03 = 09**

1. Write down the working of a electric steering system, explain the procedure by utilising the sensor used in the system.
2. Write down the condition after which tyre repair is not recommended.
3. Explain four wheel steering system, what can be the maximum angle till which the rear tyre can be steered?

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23 (SUMMER SEMESTER)			
B.Voc/M.Voc	**B.Voc** **Semester**	3rd and 5th	
Course name / Module	Basics of Automobile		
Course code	AUT1115 (OPEN ELECTIVE)		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS
• Maximum Marks: **20**
• Duration of Examination: **01 Hour**
• Attempt all questions.

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

1. Piston's top most position during the piston movement inside the cylinder block is called_____
    a. BDC
    b. Bore
    c. TDC
    d. Stroke
2. Horse power is_____
    a. Ability of horse to run
    b. Unit of Power
    c. Unit of Torque
    d. None of above
3. Correct sequence for engine four stroke cycle is:
    a. Power > Compression > Intake > Exhaust
    b. Intake > Power > Compression > Exhaust
    c. Compression > Intake > Exhaust > Power
    d. Intake > Compression > Power > Exhaust
4. Diesel engine and Petrol engine can be classified under which following category:
    a. Layout
    b. Fuel
    c. Fuel injection system
    d. Based on stroke
5. Petrol engine are mostly found in applications where high engine:
    a. Torque is required
    b. Power is required
    c. Both
    d. None of the above

2. **Section B** (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

Q6. Write application of any four components of IC Engine

Q7. What do you understand by FWD and RWD in Vehicle.

Q8. Difference Between Petrol and Diesel Engine.

3. **Section C** (03 long type questions, each question carries 03 marks)	**03×03 = 09**

Q9. Explain the working of four stroke engine used in Automobiles

Q10. Write the Classification of Automobile.

Q11. What do you understand by Chassis? Draw layout of Chassis.

Ans Key

School of Automotive skills

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23(SUMMER SEMESTER)			
B.Voc/M.Voc	**B.Voc** **Semester**	3rd	
Course name / Module	Automotive Power Train-II		
Course code	AUT1301		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS
• Maximum Marks: **20**
• Duration of Examination: **01 Hour**
• Attempt all questions.

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

Q1. The pipe which connects the intake system to the inlet valve of the engine and through which air or air-fuel mixture is drawn into the cylinder is known as _____

a)SparkPlug

b)Connecting-Rod

c)Camshaft

d) Inlet Manifold

Q2. The end of the connecting rod which fits over the gudgeon pin is known as _____ connecting rod.

a)Small-end

b)Big-end

c)Piston

d) Cylinder block

Q3.What is the firing order of a four-cylinder engine?

a)1-3-4-2

b)1-4-3-2

c)1-2-3-4

d) 4-3-2-1

Q4. The ratio of the actual weight of air induced by the engine in the intake stroke to the theoretical weight of the air that should have been induced due to piston displacement at intake temperature and pressure is known as _____

a)Efficiency-ratio

b)Volumetric-efficiency

c)Mechanical-efficiency

d) Indicated thermal efficiency

Q5. What is the compression ratio in SI engines?

a)6–10

b)3–5

c)1–2

d) 11 – 15

2. Section B (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

Q6. Explain the function of the Piston

Ans: Pistons play a vital role in an automobile engine including the spark ignition gasoline engine and compression ignition diesel engine. These two internal combustion engine process is different but they utilize piston for their processes. Below are the functions of the piston on an automobile engine:

- The major function of the piston is to transfer the force output of a small gas explosion in the cylinder to a crankshaft. This provides rotational momentum to a flywheel.
- It moves forward so that gases can be compressed and an explosion can occur for the backward movement.
- The piston contains a pin called a piston pin, it allows the gas in the chamber from escaping.
- A connecting rod attached to the piston's bottom allows the mechanical work to be transferred.
- Pistons help to carry the air-fuel mixture within the period of the combustion cycle.
- Pistons aid the control of oil flow in the cylinder walls using the oil control ring.

Q7.Why valve clearance is provided in IC Engine

Ans: Valve clearance is the gap between the rocker arm and the head of the exhaust and inlet valves. It is provided to mitigate the thermal expansion of the valves. If the tappet clearance isn't appropriate, positive seating of valves is affected leading to leakage and if the clearance is large it could lead to the late opening of the valves. Tappet clearance is measured when the engine is cooled and the piston is at TDC. It is measured using a feller gauge. Suction valve clearance is measured to be 0.35 mm and exhaust valve clearance should be near about 0.45 mm.
It is adjusted by tightening or loosening the lock nut in the rocker's arm

Q8.Write the sequence of valve train of OHC Engine

Ans: Timing Belt-Cam Gear-Camshaft- Rocker Shafts- Rocker Arms- Valve Springs- Valves

3. Section C (03 long type questions, each question carries 03 marks)	**03×03 = 09**

Q9.What is a firing order? Why firing order is provided?

Ans: Engines cylinders don't fire in the sequence of 1-2-3-4-5-6 and so on. It could cause the crankshaft to deform or break. So, manufacturers shuffle the combustion in such a way that it creates power balance in the engine. The order or sequence in which the engine cylinders fire or generate & deliver power is called the engine firing order.

Firing order in an engine is important because a correct firing order can cause minimum vibrations in the system. Minimum vibration in automobiles is desired as the ride can become smooth and the driver and passengers won't feel the vibrations being transmitted by the engine as it is very less.

At the same time, correct firing order can lead to a reduction in overheating and the engine runs cool due to the non-continuous firing of adjacent cylinders

Also firing order helps in proper and easy removal of exhaust gases,which in turn improves the volumetric efficiency of the engine

Q10.Explain the working of Four stroke diesel engine.

Ans: **Working principle of CI engine:**

1. Suction stroke: During this stroke, the inlet valve is open and the exhaust valve is closed. Only air is sucked into the cylinder during this stroke. The piston moves from TDC to BDC and the crankshaft rotates through 180°.

2. Compression Stroke: The air inducted in the cylinder is compressed to the clearance volume. Both valves are closed during this stroke. The piston moves from BDC to TDC and the crankshaft rotates through 360°.

3. Power stroke or Working stroke: At the end of the compression stroke the fuel (diesel) is injected into the hot compressed air. The rate of injection is such that pressure remains constant instead of the change in the piston position. After injection of the fuel is complete the hot gases expand. The piston moves from TDC to BDC position and the crankshaft rotates through 540°.

4. Exhaust Stroke: The inlet valve remains closed and the exhaust valve opens. The piston moves from BDC to TDC position which pushes the burnt gases outside the combustion chamber. The crankshaft rotates by two complete revolutions through 720°.

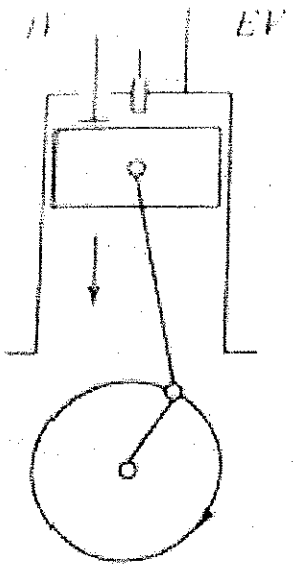


Figure: Working principle of four – stroke C. I. engine

Q11.Write the procedure of inspecting and replacing the piston ring and piston

Ans: The following are general procedures for inspections, maintenance, and replacement of piston rings and pistons.

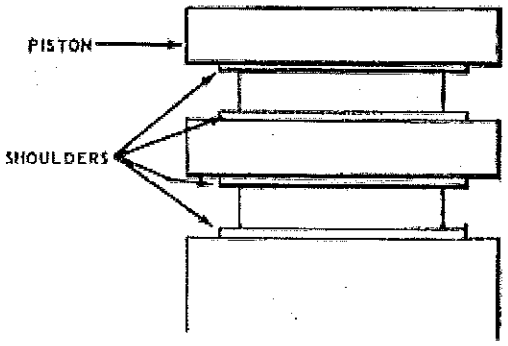
Over a period of time all piston rings wear. Some stick and may even break. While you may be able to free stuck rings and make them serviceable, you must replace excessively worn or broken rings with new ones. The installation of a new set of rings in an engine requires great care. Most of the damage that is done occurs when the rings are placed in the grooves of a piston or when the piston is inserted into the cylinder bore.

Be very careful when you remove the piston and connecting rod from the cylinder. In most engines, you should not remove a piston from a cylinder until you have scraped the cylinder surface above the ring travel area. In addition to removing all carbon, you must remove any appreciable ridge before removing the piston.

Do not remove a ridge by grinding, as this will allow small abrasive particles from the stone to enter the engine. Use a metal scraper and place a cloth in the cylinder to catch all metal cuttings. You can usually scrape enough from the lip of a cylinder to allow the piston assembly to slide out of the liner. After removing the piston, you can make a more detailed inspection of the ridge.

With the piston and connecting rod removed, check the condition and wear of the piston pin bushing, both in the piston and in the connecting rod. After removing the rings, thoroughly clean the piston with special attention to the ring grooves.

Make another complete inspection after cleaning the piston. Check all parts for any defects that could require the replacement of the piston. Give particular attention to the ring grooves, especially if the pistons have been in service for a long period of time. A certain amount of enlargement of the width of the grooves is normal, and SHOULDERING of the groove may occur.



Shouldering usually requires the replacement of the piston since the shoulders prevent the proper fitting of new rings. When installing rings, measure the gap with a feeler gauge. To measure the gap, place the new rings inside the cylinder liner or in a ring gauge. When the gap is measured with the ring, two measurements are necessary one just below the upper limit of ring travel, and the other within the lower limit of travel. These measurements are necessary because the liner may have a slight amount of taper caused by wear. The ring gap must be within the limits specified in the manufacturer's technical manual. If the gap of a new ring is less than specified, file the ends of the ring with a straight-cut mill file to obtain the proper gap. If the gap is more than specified, install oversized rings. To measure the ring gap of used rings, hold the rings in place on the piston with a ring compressing tool. But before you measure the ring gap with the ring on the piston, first measure the piston for wear and out-of-roundness.

After ensuring the proper gap clearance, you can reinstall the piston pin and connecting rod. When installing piston rings, spread them as little as possible to avoid breaking the rings. Insert the lowest ring first. When all the rings have been installed, check the ring-to-land clearance. If the clearance is too small, the ring may bind or seize, allowing improper sealing and blowby to occur. If the clearance is excessive, the ring may flutter and break itself, or the piston land.

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23 (SUMMER SEMESTER)			
B. Voc.	**Semester**	3rd	
Course Name	Automotive Braking, Suspension and Steering System		
Course Code	AUT1302		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS

- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

1. What is TWI stands for?

a) Tire wear indicator
b) Tread value indicator
c) Tread wear indicator
d) None of the above

2. Which one of the following sensors in the electronic steering system is used to change the output to the steering motor as per real-time conditions?

a) Steering angle sensor
b) Torque sensor
c) Vehicle speed sensor
d) All of the mentioned

3. Which one of these is not part of the hydraulic steering system?

a) Hydraulic Pump
b) Electric Motor
c) Steering wheel
d) Rack and pinion

4 If a person turns the steering wheel 450 degrees then how much should the wheel turns while having a steering ratio of 40:4?

a) 11 degrees
b) 120 degrees
c) 45 degrees
d) None of the above

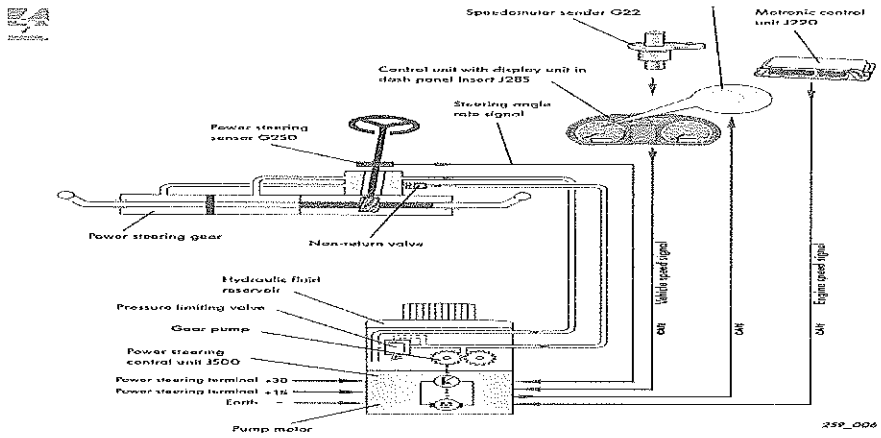
5. Which of the following steering system works on the turning and sliding mechanism?

a) Ackermann
b) a & b
c) Davis
d) None of the above

2. Section B (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

1. Write down the name of components in a hydraulic electirc steering system?

Ans.



2. What do you understand by sliding and turning pair?

Ans. Sliding Pair: This consists of two components connected in such a way that one is constrained to have a sliding motion relative to another component, Then the pair is known as sliding pair.
Example: Rectangular bar in a rectangular hole, Square bar in a square hole, Piston and cylinder of an IC engine, and Tail- Stock and lathe bed, etc.
Turning Pair: This consists of two components connected in such a way that one is constrained to turn or revolve about a fixed axis of another element, Then the pair is known as the turning pair.
Example: Shaft with a collar at both ends revolving in a circular hole, The crankshaft of an IC engine turning in a bearing, Cycle wheels revolving about their axles, etc.

3. Write down the major fucntions of a tyre.

Ans. 1. Holding air to carry the vehicle's load (i.e. the amount of weight the vehicle can support) – Cus-tomers should select a tire that is recommended for their vehicle and that has the appropriate load rating to avoid premature wear, damage and, most importantly, tire overload.
2.Responding to road hazards such as potholes, debris, etc. – Depending on the environment, these hazards can cause minimal to severe damage to your customers' vehicles. Tires get the brunt of the impact – making tire quality, durability and strength crucial.
3.Responding to the vehicle's steering – A vehicle's steering, handling and braking is directly related to the tread on the tires, which is covered in more detail below.
4.Stopping and accelerating a vehicle – The vehicle can't move without the tires!

3. Section C (03 long type questions, each question carries 03 marks)	**03×03 = 09**

1. Write down the working of a electric steering system, explain the procedure by utilising the sensor used in the system.

Ans. Power steering systems supplement the torque that the driver applies to the steering wheel. Traditional power steering systems are hydraulic systems, but electric power steering (EPS) is becoming much more common. EPS eliminates many HPS components such as the pump, hoses, fluid, drive belt, and pulley. For

this reason, electric steering systems tend to be smaller and lighter than hydraulic systemsHow the system works:

The EPS electronic control unit (ECU) calculates the assisting power needed based on the torque being applied to the steering wheel by the driver, the steering wheel position and the vehicle's speed.
The EPS motor rotates a steering gear with an applied force that reduces the torque required from the driver.

2. Write down the condition after which tyre repair is not recommended.

- Ans. **Inspect the tire:** Do not repair a tire with any of the following defects, signs of damage, or excessive wear.

1. Tires with the wear indicators showing.
2. Tires worn until the fabric or belts are exposed.
3. Bulges or blisters
4. Ply separation
5. Broken or cracked beads
6. Cuts or cracks anywhere in the tire

3. Explain four wheel steering system, what can be the maximum angle till which the rear tyre can be steered?

Ans. Four-wheel steering technology is beneficial because it increases the vehicle's steering response time and helps keep the vehicle stable at higher speeds. With all four wheels steering, instead of only the front two, this technology offers unprecedented control and maneuverability. That being said 4 wheel steering takes some getting used to.

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23(SUMMER SEMESTER)			
B.Voc/M.Voc	**B.VOC**	**Semester**	3rd
Course name / Module	AUTOMOTIVE BODY WORKS		
Course code	AUT1303		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS

- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.
-

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

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

2. Section B (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

1. Body fillers are generally polyester resin based filler with a cream hardener that can be used to even out dents and cover blemishes on vehicles.
   Body fillers all fall into three general categories: standard, mid-range, and premium, and are generally available in a two-part material consisting of a polyester resin and a cream hardener.
   The filler grade you select will depend on the scope of the project and the size of the damaged spots needing to be repaired.
   Standard grade is a great option for minimal hail damage and small rust spots, while premium grade should be used for actual tears or a large surface area.
2. Basic tools like hammers, mallets, dollies, sanding blocks, spoons, portable grinders and sanders, stud welders and slide hammers, panel flangers, pneumatic tools, chisel, nibblers, clamps, etc.
3. Sanding blocks are commercially available in a wide variety of shapes, styles, size, and materials. Sanding can help you to get the best results, but without a sanding block you'll be wasting your time. Sanding blocks help you to exert even pressure on the sandpaper, while minimizing waves in the panel being sanded.

3. Section C (03 long type questions, each question carries 03 marks)	**03×03 = 09**

1. **Etching or Epoxy Primer**

- Paint applied with no primer after finishing bodywork will most likely peel off in large sections. Many American automobiles manufactured in the late 1980s and early 1990s are common examples of this effect: these vehicles were primered before paint was applied, but the primer was not compatible with the surface. Vehicles from this era saw paint peeling off in sheets, exposing the surface below to the weather.
- The main purpose for primer is to promote adhesion between the surface repaired and the subsequent top coats, whether body filler or paint. No one universal primer product will adequately prepare every surface for paint. Choose primer for the material that it is intended to cover. Fiberglass call for different primer than aluminum, which require different primer than galvanized steel. Some material can be primed with regular primer, while other are better suited for epoxy primer.
  Two main reasons for using epoxy primer are its superior corrosion protection and excellent adhesion qualities, yet epoxy primer cannot be used for every application. Consult your local pain jobber for recommendations on the best primer for your particular needs. Any time a sheet metal panel is stripped (whether chemically or mechanically) to bare metal, it should be clean and coated with etching or epoxy primer as soon as possible, to avoid the formation of surface rust. Most body fillers can be applied over etching or epoxy primer, so there will be no reason to go back to bare metal during the repair process.

Sand Paper

- Sandpaper and Glass-paper are names used for a type of coated abrasive that consists of sheet of paper or cloth with abrasive material glued to one face.
- Despite the use of names sand or glass, they have been replaced by other abrasives such as aluminium oxide or silicon carbide.
- Sandpaper is produced in a range of grit sizes and is used to remove material from surfaces, either to make them smoother (for example, in painting and wood finishing), to remove a layer of material (such as old paint), or sometimes to make the surface rougher (for example, as a preparation for gluing).
- A small number such as 20 or 40 indicates a coarse grit, while a large number such as 1500 indicates a fine grit.

2. Always combine the exact amounts of filler and creme hardener as instructed on the packaging to achieve the best results. Too much hardener to filler ratio and the filler will be brittle and crack, and too little will delay drying and hardening almost indefinitely.

Use a non-cardboard mixing board when combining the filler and hardener. Because of its absorbent properties, cardboard can affect the chemistry of the filler. Auto Body Toolmart sells disposable mixing boards that are designed specifically for mixing body filler. Completing any filler projects on a warm dry day, as opposed to a humid day, will help the filler cure faster.
NEVER use filler over an area that has pre-existing rust. When rusty spots are not removed first, there is higher potential for staining and discoloration, and the filler will not adhere completely. For best results, remove the rust and then proceed. Filler adheres best to non-smooth surfaces, so sanding the area that needs improvement
to roughen the surface is essential to achieving the best results possible.
Because of its chemical make-up, make sure you're in a well-ventilated area when using filler. Wearing a dust mask is recommended.

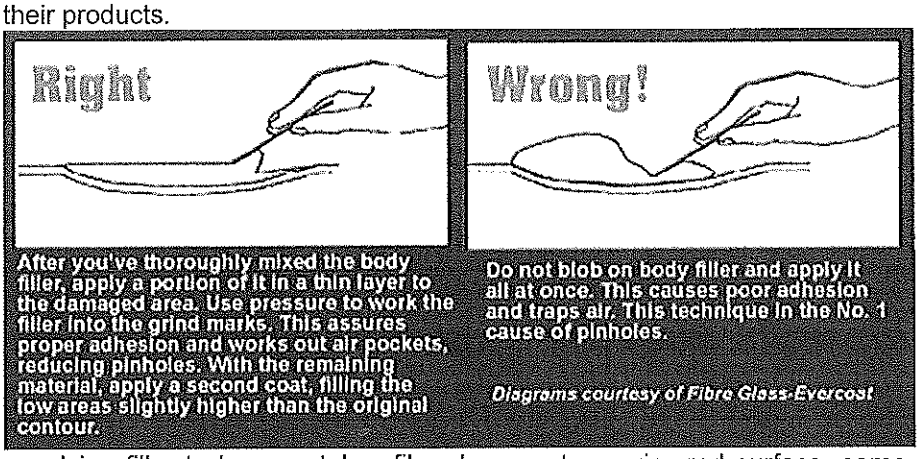
Occasionally, your filler will feel as if it's hardening too quickly during the application process. You avoid this problem by having a filler thinner on hand. Sometimes called "Honey", Ever-coat's filler thinner is fiberglass-reinforced — much like a medium grade filler — and helps keep the filler spreading evenly and smoothly.
No matter how good you may be with a body hammer, if you may have straightened any sheet metal or installed patch panels, you will probably need to apply at least a skim coat of body filler. True, there are some craftsmen who can finish metal on a vehicle so perfectly that they don't need filler. However, you probably aren't working at that level of expertise yet. Before applying any filler, take the time to consult an expert and verify that you are using compatible materials. You'll be much better off if you determine the appropriate filler product for your use before starting work.

Consider the material to which you're applying the body filler: sheet metal, galvanized steel, fiberglass, or aluminum. It's always better to do the work correctly the first time than have to do it a second (or third) time or have to live with results that leave a lot to be desired.

If you purchase your bodywork suppliers at a dealer who sells to professionals, the person behind the counter most likely knows which product are best for your particular application. However, if you look for body filler at the local discount retailer, you may be hard-pressed to find someone who even knows how to use this product. While the label of most body fillers will indicate how they are used on bare metals, that information will probably not explain how to apply the product on your particular project.

Plastic body fillers have evolved greatly since they appeared on the market as an alternative to lead. Several different companies now make plastic body filler, and most offer a variety of products to choose from, depending on your application. Some fillers are designed for use over fiberglass, while other are designed for sheet metal; still other call for an undercoat of epoxy primer to increase adhesive or an application performed directly on bare metal. Like many primer products, some fillers smooth out rough bodywork, while others are used for finish coats. Put simply, not all body fillers are created equal or even to perform the same task. If you use the wrong type of filler, this will show soon after the vehicle is parked in the sun. And I doubt you plan on keeping your car parked in the garage forever.

Nearly all the body fillers require the same method for application, but you should read the directions for the particular product to be sure. Typically, the surface to be filled is sanded down to bare metal before applying filler. Some fillers suggest that the surface be stripped of any paint and a coat of epoxy primer applied before starting with filler. Most auto body paint and supply stores can provide printed information that indicates the compatibility of their products.



Whether you're applying filler to bare metal or fiberglass, or to a primered surface, some amount of filler material is spread onto a mixing board or mixing sheet and then mixed thoroughly with a proportionate amount of hardener, using a flexible spreader. The amount of hardener needed depends on your shop conditions, such as the temperature and humidity. Practice is the best way to determine how much to use. As a start, though, add a proportionate amount of hardener to the filler (i.e., a quarter tube of hardener to a quarter of the container of filler). Use too little hardener sand it will not set up properly, while too much hardener will set up right on your mixing board. Don't be surprised if it takes the entire project before you get the amounts right. If it gets a little too cool as you mix it, speed the curing process slightly by placing a portable heater or heat lamp nearby. If the filler begins to "kick" before you have it spread out, scrape it off the mixing board and throw it away: you won't be able to spread it properly.

Most body fillers use a hardener that is distinctly different in colour that the filler itself: this make it easy to tell when the two are mixed thoroughly. When the mix is the same color throughout, it is well mixed; if there are streaks of color, keep on mixing. Once the filler and the hardener are mixed thoroughly (i.e., the material is all one color), scoop some filler onto a flexible spreader and spread the filler on the target area, then make a couple of light passes with an empty spreader to even out the filler.

For best results, don't apply body filler more than 1/8 inch thick total. If you need more than this, try to metalwork the area being repaired slightly more before applying any filler. If the hammer and dolly work isn't feasible, and the area to be filled is deeper than 1/8 inch, use two applications of filler rather than attempting to fill it all at one time. Like most auto body repair products, filler cures as its various chemical components react and escape from the remaining material. Too thick an application will often cure on the outside before the chemical reaction takes place on the inside, trapping uncured material inside the repair. When this happens, the repair won't be durable and will ultimately show up in the finished paint job.

Some older types of filler require initial smoothing, with a cheese-grater type file, while most newer products can be smoothed initially with 80-grit sandpaper. Check with the person behind the counter where you purchase your products to determine the best method for smoothing. If you are using any type of filler that requires a cheese-grater, initially smoothing should take place right before the filler cures completely. Watch the edge of the filler to get a feel for whether it has cured enough. If the filler starts breaking away at the edges, or if the sandpaper starts loading up, the filler has not cured sufficiently.

While it's hard to say what the correct time for curing will be, a little practice will reveal how long you need to wait. Knock off the height spots before the filler gets rock-hard, but don't try this too soon or you'll likely gouge out more material than desired. As you begin working the filler, sand the entire filled area first with 80-or 100-grit sandpaper, then switch to 200- or 240-grit to blend the filler into the surrounding area. Once you're finished sanding with 240-grit, you will have a good idea if you need more filler before you apply primer.
When you finish sanding, blow all of the dust away with an air nozzle. If there are still low spots, rough up the area lightly with the previous grit of sandpaper, then mix an appropriate amount of body filler and apply as before. Work the second and successive layers of filler (if required) just as the first, until all low areas are filled.

3. FIBERGLASS

Fiberglass is a lightweight, extremely strong, and robust material. Fiberglass combines its light weight with an inherent strength to provide a weather resistant finish with a variety of surface textures.
Fiberglass really is made of glass, similar to windows or the drinking glasses in the kitchen. The glass is heated until it is molten, then it is forced through superfine holes, creating glass filaments that are very thin. fiberglass itself may be manufactured from recycled glass Originally, fiberglass was a glass wool with fibers entrapping a great deal of gas, making it useful as an insulator, especially at high temperatures.
The basic raw materials for fiberglass products are a variety of natural minerals and manufactured chemicals. The major ingredients are silica sand, limestone, and soda ash. Silica sand is used as the glass former, and soda ash and limestone help primarily to lower the melting temperature Waste glass, also called cullet, is also used as a raw material. The raw materials must be carefully weighed in exact quantities and thoroughly mixed together (called batching) before being melted into glass.
For custom work or bodywork repair, you can easily learn to work with fiberglass, a material doesn't require specialized equipment. Obviously, fiberglass can be used to repair components made of the same material, but it can also be used as an alternative to welding in sheet metal patch panels.
Fiberglass mat is commonly used when repairing holes or anywhere you need to build up bulk. Composed of short stands of glass fibers bound together, not woven, the mat is saturated with fiberglass resin, making it quite pliable and easy to form into complex shapes. As each layer of fiberglass mat is added, the laminate becomes thicker and stiffer.
Fiberglass cloth is more suitable to repairing cracks, breaks, or holes where there are few complex shapes. Since fiberglass cloth is made of woven glass thread, it is difficult to mold to curved shapes without wrinkling. To get the cloth to lie flat on a curved surface, several small cuts can be made in the cloth before the resin is applied. Fiberglass cloth is thinner than fiberglass mat, so avoid using cloth when your goal is to build up bulk in the repair area. However, a repair made with cloth will be stronger than a repaired area made with an equal thickness of mat, since the cloth contains a larger amount of glass.

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23(SUMMER SEMESTER)			
B.Voc/M.Voc	**B.Voc**	**Semester**	3rd
Course name / Module	Automotive Refinish Painting		
Course code	AUT1304		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS

- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.
- Marks will be deducted if over writing is found in answer copy.

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

Q-1. What does 1-k represent?

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

Q-2. What defines the chroma of color

a. Brightness and dullness
b. Lightness and Darkness
c. Hue
d. None of the above

Q-3. What grade of sanding disc is used to remove Dual action sanding marks on bare metal?

a. P320
b. P120
c. P80
d. None of the above

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

a. Anti-Rust Coat
b. Adhesion promoter
c. Both (a) and (b)
d. None of the above

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

a. 100:2
b. 100:20
c. Depends on manufacturer
d. None of the above

2. **Section B** (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

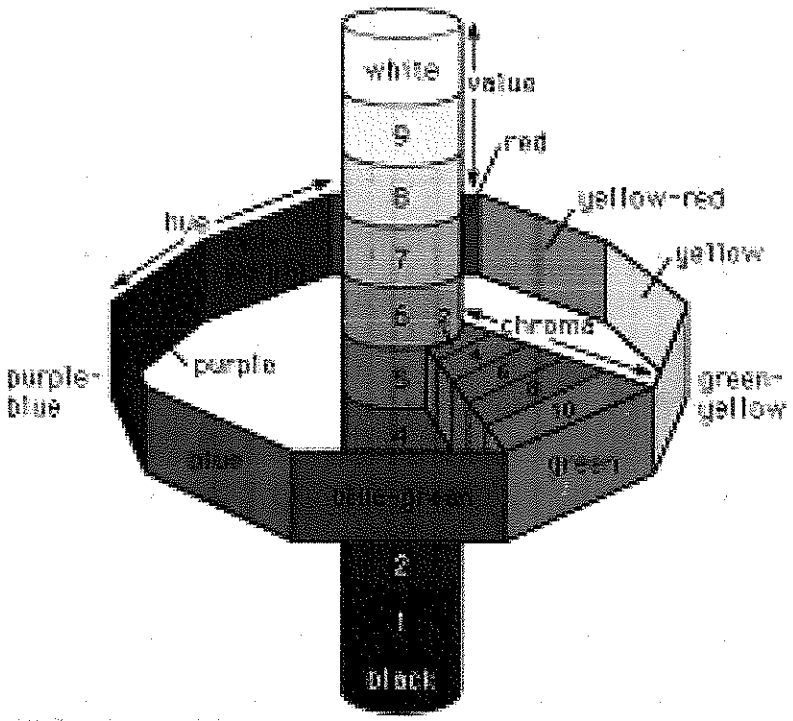
Q-6. What are the difference between body filler and putty?
Ans. Putty is essentially a thick paint with a filler material - it's generally used for very small scratches where the metal is not exposed. Air hardening. Body filler is a polyester resin suitable for small dents. Chemical hardening, a cheap and easier (by a long way) substitute for body solder. The car putty or bodywork putty is one of the most commonly used items in the process of preparing and painting bases in any body shop. It is a very thick paint that is easy to handle, and it comes in paste or cream format.

Q-7. What are the difference between scuffing and sanding?
Ans. Scuffing is a process in which we do the roughness on surface for better adhesion without removing layer or coat on the material whereas sanding is the process to remove layer from the surface for re work and re-process.

Q-8. What is the difference between Value and Chroma?
Ans. Value (lightness) describes overall intensity to how light or dark a color is. It is the only dimension of color that may exist by itself. Chroma (Saturation) may be defined as the strength or dominance of the hue. On the outer edge of the hue wheel are the intensely saturated hues.

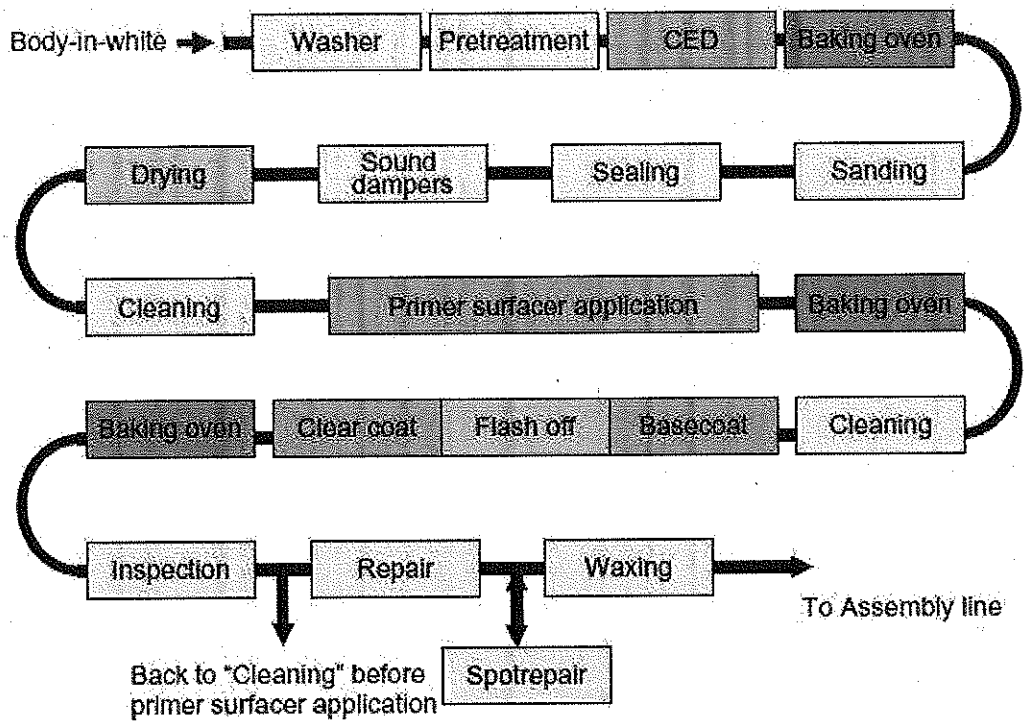
3. **Section C** (03 long type questions, each question carries 03 marks)	**03×03 = 09**

Q-9. Draw Color Sphere and define Hue, Value and Chroma.



Ans.

Q-10. Write down the Steps for Standard Repair Process.



Ans.

Q-11. Write the names of Primary and Secondary Color According to hue circle diagram.

Ans.Primary colors: - **Red, Yellow, Green, Blue.**

Secondary Color: - **Purple, Orange, Pink, Violet**