

Set - 1

Model Answer

Automobile

Paper Title: **Pollution and Quality Check**

Paper Code: **402106**

Q.1.(a)

- i. c
- ii. c
- iii. d
- iv. d
- v. d

Q.1.(b)

- i. TRUE
- ii. TRUE
- iii. FALSE
- iv. TRUE
- v. TRUE

Group - A

Q.2

(a) What are the major sources of air pollution?

Ans:-

1. Flue gases
2. Emission from refineries
3. Emission from factories
4. Exhaust from automobiles.

(b) What are the methods of controlling the oxides of nitrogen present in an IC engine?

Ans:-

1. By controlling the formation of  $\text{NO}_x$  itself by changing the operating parameters
2. By using a catalyst in the exhaust system to reduce  $\text{NO}_x$  and oxygen after its formation.

(c) Enlist the defects during paint storage.

Ans:-

1. Settling : Settlement of pigment to the bottom and **failure to re-disperse**.
2. Skinning: Formation of a layer of skin on the container
3. Gelling: Decreasing viscosity caused by bacterial degradation of the protein binder of other thickening agents.

Q. 3.

(a) What are the factors affecting <sup>diesel</sup> ~~design~~ smoke?

Ans:-

1. Cetane number
2. Volatility
3. Viscosity
4. Chemical composition

(b) What are the main factors increasing NO<sub>x</sub> emission?

Ans:-

1. Air fuel ratio
2. Engine rpm
3. Engine temperature
4. Compression ratio
5. Engine load
6. Quality of fuel

(c) How does CNG bring out reduction in auto-emission?

Ans:-

Methane constitutes 85 to 99% of natural gas and it is the lightest hydrocarbon. This makes natural gas inherently clean burning fuel, reducing the auto-emission.

#### Group - B

Q4. Mention the causes of white and black smoke exhaust.

Ans:-

White smoke may be due to

1. Plugged fuel valves

2. Excessive fuel pressure
3. Improper setting of fuel valves
4. Too much lubricating oil
5. Water in cylinders and exhaust

Cause of black smoky exhaust

1. Too light fuel or low density fuel
2. Over load
3. Plugged spray nozzle valves
4. Very high fuel pressure.

Q5. Write a short note on reduction of formation of pollutants.

Ans:-

This is achieved by the following:

1. Closed crankcase ventilation.  
There are two variations of this system, viz, the positive crankcase ventilation and the Fixed orifice system. In the former, filtered air from the carburettor air cleaner is introduced in the crankcase from where it carries away the blow-by gases and the gasoline vapours to the engine inlet manifold through a special PCV valve.
2. Reducing evaporative emissions.  
The petrol vapours from the fuel tank escape into the atmosphere by evaporation or 'breathing'. With the increase of temperature, the air inside the fuel tank which carries petrol vapours, expands and is thus forced out through either the filter cap vent of the tank vent tube.
3. Redesigning the engine;
  - (i) Combustion chamber
  - (ii) Cooling system
  - (iii) Valve timing
  - (iv) Fuel supply system
  - (v) Ignition system
4. Improving vehicle efficiency
5. Use of HCCI engine
6. Use of hybrid vehicles
7. Improving driving efficiency and traffic conditions
8. Improving on-board diagnostic systems.

Q6. Briefly describe the causes of loss of gloss in painting.

Ans:-

Reduction of lustre on drying caused by severe absorption of undercoat.

Possible Causes	Preventive Measures	Remedial Methods
Application on rough or unclean surfaces	Increase frequency of painting in thin film	Remove paint film. Sand, clean and re-paint as in "Preventive Measure"
Inadequate or excessive	Paint adequate thickness of film	

dilution		
Use of unsuitable thinner	Use appropriate thinner as recommended by manufacturer	
Application of excessively thin film	Avoid painting at high humidity	
Result as blushing occur	Prepare receiving surface and apply appropriate sealer	
Drying occurs in the presence of excessive moisture and pollutant		

... which is connected to the air blowers supplying the requisite air to the tuyeres. A little above the charging part of the furnace lining above the charge door need not necessarily be closed and a sand bed with a gentle bed of suitable height is prepared above the sand bottom. When the coke bed is properly ignited, alternate layers of coke and iron ore are introduced through the charge door maintaining the necessary prop...

FACULTY, AUTOMOBILE

1929

$$x = \frac{1.5 \times 10^3}{0.0003} = 5 \times 10^6$$

$$y = \frac{1.5 \times 10^3}{0.0003} = 5 \times 10^6$$

... in the ...

$$z = \frac{1.5 \times 10^3}{0.0003} = 5 \times 10^6$$

$$w = \frac{1.5 \times 10^3}{0.0003} = 5 \times 10^6$$

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