

Easy

Deputy Executive Engineer (Electric)

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ports Authority of Gujarat / Assistant Engineer (E)

Consider the following statements regarding "Waste Heat Recovery" (WHR):

- 1. It involves capturing heat from industrial exhaust gases to generate steam or power.**
- 2.**

A

1 and 2 only

Correct

B

2 and 3 only

C

1 only

D

1, 2 and 3

Correct Answer: A

Full Detailed Explanation

Correct Answer: A - 1 and 2 only

Quick Concept Explanation Waste-heat recovery captures thermal energy that would otherwise leave through exhaust gases or hot process streams and uses it for feedwater heating, steam generation, process heating or power generation. Boiler economizers are a classic example because they use flue-gas heat to preheat feedwater, reducing fuel requirement and emissions for the same useful output.

Exam focus: Economizer = flue-gas heat recovery to feedwater. Common trap: WHR generally reduces, not increases, carbon intensity.

Statement-wise Verification

Statement 1 - Correct. It involves capturing heat from industrial exhaust gases to generate steam or power. Waste-heat recovery captures thermal energy that would otherwise leave through exhaust gases or hot process streams and uses it for feedwater heating, steam generation, process heating or power generation.

Statement 2 - Correct. Economizers in boilers are a common example of WHR. Boiler economizers are a classic example because they use flue-gas heat to preheat feedwater, reducing fuel requirement and emissions for the same useful output.

Statement 3 - Incorrect. WHR increases the carbon footprint of the industry. Recovering otherwise wasted heat generally reduces fuel use and emissions for the same useful output.

Core Concept Waste-heat recovery captures thermal energy that would otherwise leave through exhaust gases or