



C20-MET-303

7289

BOARD DIPLOMA EXAMINATION, (C-20)  
OCTOBER/NOVEMBER—2023

DMET - THIRD SEMESTER EXAMINATION

FUELS, REFRACTORIES AND PYROMETRY

Time : 3 Hours ]

[ Total Marks : 80

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**PART—A**

3×10=30

- Instructions :** (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Define the terms (a) flash point and (b) fire point.
2. List any six characteristics of metallurgical coke.
3. Define gasification.
4. Write the composition and uses of producer gas.
5. List the applications of wind energy.
6. Classify the non-conventional energy resources.
7. Define the term refractory and classify them.
8. List any three applications of silica refractories.
9. State the different modes of heat transfer.
10. Define the Stefan-Boltzmann law of radiation.

**PART—B**

8×5=40

- Instructions :** (1) Answer **all** questions.  
(2) Each question carries **eight** marks.  
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

**11.** (a) Explain the merits and demerits of solid, liquid and gaseous fuels.

**(OR)**

(b) Explain the manufacturing of metallurgical coke by beehive process.

**12.** (a) Explain the manufacturing process of water gas with a sketch.

**(OR)**

(b) Explain the necessity of pulverization and also state the advantages and disadvantages of pulverization.

**13.** (a) Explain the use of solar energy as non-conventional resource.

**(OR)**

(b) Explain the merits and demerits of wind energy as non-conventional resource.

**14.** (a) Explain the causes of refractory failures and mention the remedies.

**(OR)**

(b) Explain the manufacturing process of silica refractories with a flow sheet.

**15.** (a) Explain the working principle of thermocouple and state its advantages and limitations.

**(OR)**

(b) Describe the working principle of optical pyrometer with a diagram.

**PART—C**

10×1=10

- Instructions :** (1) Answer the following question.  
(2) The question carries **ten** marks.  
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

- 16.** The volumetric analysis of blast furnace gas is  $\text{CO}_2$  - 17%,  $\text{CO}$  - 22.1%,  $\text{H}_2$  - 4.9%,  $\text{N}_2$  - 55.8% and  $\text{O}_2$  - 0.2%. Convert this volumetric analysis to percentage analysis by weight.

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