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[45]

SARDAR PATEL UNIVERSITY

S.Y. B.Sc. Industrial Chemistry SEMESTER – III
EXAMINATION -2022
Chemical Process Principles & Engineering Materials
SUB CODE: US03CICH51

DATE: 15/11/2022
DAY: Tuesday

TIME: 10.00 AM TO 01.00 PM
TOTAL MARKS: 70

Q. 1 Choose the correct answer. [10]

(1) For expressing trace amount of impurities in the system _____unit is preferable.
- (A) Percentag
- (B) parts per million (ppm)
- (C) Molarity.
- (D) Normality.

(2) ° API specific gravity scale is develop for
- (A) Polymer industry .
- (B) parts per million (ppm)
- (C) Petroleum industry.
- (D) Pharmacy industry.

(3) Total pressure in the system is equal to the sum of partial pressure is_____
- (A) Mole Percentage.
- (B) Dalton's law.
- (C) Amagat's law.
- (D) Barometric pressure

(4) The capacity of an object to do work is_____
- (A) Work.
- (B) Energy.
- (C) Heat.
- (D) Force.

(5) The properties which are dependent on mass are_____
- (A) Extensive properties.
- (B) Adiabatic process.
- (C) Energy balance.
- (D) Phase change.

(6) Which of the following is a type of energy _____
- (A) Work.
- (B) Heat.
- (C) Kinetic.
- (D) All of the above.

(7) In material science mainly refers to _____
- (A) Solid material
- (B) Fluid only
- (C) a & b both
- (D) none of the above

(8) Material science mainly deals with engineering science like _____
- (A) Metallurgy
- (B) ceramic
- (C) polymer science
- (D) all of the above

(9) Common glass, is called:
- (A) Soda glass
- (B) flint glass
- (C) hard glass
- (D) Pyrex glass.

(10) Annealing of glass is:____
- (A) Cooling glass articles rapidly
- (B) Passing molten glass between rollers
- (C) Allowing glass articles to cool gradually
- (D) Plunging glass

P.T.O.

Q.2 **Answer the following.(attempt ten)** [20]

(1) Write about average molecular weight.

(2) State: Dalton's low, Amagates low.

(3) Explain Average molar weight.

(4) Define Adsorption, Adsorbent, Adsorbate.

(5) Explain Gross colorific value

(6) List the example of Industrial adsorption.

(7) Write in brief about metal used to their mode of occurrence.

(8) Write the chart Interaction between materials and their application.

(9) Write the classification of engraining requirement of materials.

(10) What is the purpose of annealing of glass?

(11) What is the chemical difference between soft glass and hard glass?

(12) What will happen if gypsum is not added during grinding of clinkers

Q.3 (A) An aqueous solution of sodium chloride is prepared by dissolving 25 kg of NaCl in 100 kg of water. Find (a) weight % (b) mole % of the solution. [05]

(B) Find the equivalent weights of : (1) HCl (2) NaOH (3) Na_2CO_3 (4) H_2SO_4 [05]

OR

Q.3 (A) (I)Convert 88 kg of carbon dioxide into kgmole. (Atomic weight of C=12) [05]
(II) Find the moles of oxygen present in 500 gm. (Atomic weight of O=16)

(B) Define density and specific gravity also discuss about specific gravity scales. [05]

Q.4 (A) Differentiate between Physical Adsorption and Chemical Adsorption. [05]

(B) Write different step used to solve energy balance process. [05]

OR

Q.4 (A) Write notes on: Thermodynamic temperature scale [05]

(B) Discuss Langmuir adsorption isotherm. [05]

Q.5 (A) Explain Material science as a subject. What are its uses to an engineer? [05]

(B) How engineering materials are classified? Explain. [05]

OR

Q. 5 (A) Discuss the factors taken in account for selecting materials for engineering design. [05]

(B) Manufacturing of white ware. [05]

Q. 6 (A) Write the manufacturing of glass. [05]

(B) Manufacturing of Portland cement with wet process. [05]

OR

(A) Write about types of cement. [05]

(B) Write about type of glass. [05]