



AQ-003-047102

Seat No. _____

BVOC (PHAR ANA) (Sem. I) (CBCS) Examination

March/April - 2016

BVPAQA - 102 : Core Unit Operation - I

Faculty Code : 003

Subject Code : 047102

Time : 3 Hours]

[Total Marks : 70

Instructions : (1) All questions are **compulsory**.
(2) Draw diagram and/or scheme wherever necessary.

1 (a) Answer the following multiple choice questions : 10

- (1) Distillation method used to remove _____.
- (a) Total hardness
 - (b) Permanent hardness
 - (c) Temporary hardness
 - (d) Remove Ca^+ and Mg^+
- (2) Sodium hexameta phosphate is known as _____.
- (a) Synthetic resin (b) Calgon
 - (c) Permutit (d) Versene
- (3) Laundry water should be relatively soft and free from _____.
- (a) Iron and Manganese
 - (b) Hydrogen and Carbon
 - (c) Calcium and Magnesium
 - (d) Salt
- (4) Combustion is a chemical reaction between _____.
- (a) Fuel and Oxygen
 - (b) Oxygen and Carbon dioxide
 - (c) Fuel and Carbon
 - (d) Carbon dioxide and Fuel

- (5) Temporary hardness is removed by _____.
- (a) Distillation (b) Boiling
(c) Clark's method (d) None of these
- (6) A safety valve usually employed with stationary boilers is _____.
- (a) Dead weight safety valve
(b) High steam and low water safety valve
(c) Level safety valve
(d) All of these
- (7) As per laboratory batch settling test, zone B is known as _____.
- (a) Uniform concentration
(b) Non-uniform concentration
(c) Clear zone
(d) Solid particles
- (8) Which is one of the type of furnace ?
- (a) Dry bottom furnace
(b) Oil fuel furnace
(c) Wet dry bottom furnace
(d) All of these
- (9) _____ is used to transfer heat energy from hot fluid to cold fluid in industry.
- (a) Heat exchanger (b) Thermometer
(c) Pressure gauge (d) All of these
- (10) Cooling tower is an example of which of the following heat exchanger ?
- (a) Direct contact type
(b) Indirect contact type
(c) Both (a) and (b)
(d) None of these

(b) Answer the following multiple choice questions : **20**

- (1) In Clark's method soluble _____ are converted in to insoluble _____.
- (a) Carbonates, bicarbonates
(b) Bicarbonates, carbonates
(c) Salt, carbonates
(d) Calcium, bicarbonates

- (2) Coke is _____ and coal is _____ fuels.
- (a) Primary, secondary
 - (b) Primary, natural
 - (c) Secondary, primary
 - (d) Artificial, secondary
- (3) Advantages of liquid fuels are _____ and _____.
- (a) Easy to transport, low cost
 - (b) Easy to transport, high ash content
 - (c) High calorific value, without foaming dust
 - (d) Easy to store, high cost
- (4) Disadvantages of solid fuels are _____ and _____.
- (a) Easy to transport, low cost
 - (b) High ash content, thermal efficiency
 - (c) High calorific value, low cost
 - (d) Easy to store, high cost low
- (5) As per laboratory batch settling test, zone A is _____ and zone D is _____.
- (a) Uniform, non-uniform
 - (b) Non-uniform, clear
 - (c) Clear zone, solid particles
 - (d) Solid particles, Non uniform
- (6) The rate of sedimentation can be artificially increased by adding _____ and which causes the precipitation of _____.
- (a) Coagulating agent, colloidal particles
 - (b) Solid particles, reducing agent
 - (c) Reducing agent, colloidal particles
 - (d) Slurry, non uniform concentration
- (7) _____ and _____ gaseous fuels are used in boiler.
- (a) Oxygen, Carbon monoxide
 - (b) Nitrogen gas, Bio gas
 - (c) Carbon dioxide, Bio gas
 - (d) Water gas, argon

- (8) In industries compressed air is so used that is _____ utility after _____.
- (a) Fourth, water (b) Second, water
(c) Third, reagents (d) Fifth, boiler
- (9) Generally _____ fluid is passed through shell side and _____ fluid is passed through tube side.
- (a) Cleaner, dirty (b) Dirty, cleaner
(c) Cleaner, cleaner (d) Dirty, dirty
- (10) 1–2 Pass heat exchanger consist of tube passing _____ times through _____ shell.
- (a) Two, one (b) One, two
(c) Two, two (d) One, one

2 Answer any **four** questions : **20**

- (1) Describe water treatment with different methods and diagram.
- (2) Explain bomb calorimeter in detail.
- (3) Explain function, quality, key components, advantages and disadvantages of boiler.
- (4) Explain compressor in detail.
- (5) Explain thickener and door thickener with diagram.
- (6) Write a short note on direct contact heat exchanger and indirect contact heat exchanger.

3 Answer any **four** questions : **20**

- (1) Define sedimentation, thickener, rapid sand filter, pressure sand filters and coagulants.
- (2) Explain boiling, Clark's method, sodium carbonate method, crude caustic soda method and distillation method.
- (3) Describe air, compressed air and important uses of air in industries.
- (4) Explain construction and working of reciprocating pump in detail.
- (5) Discuss measurement of humidity from humidity chart.
- (6) Write a short note on design of tubes in shell and tube heat exchanger.