P P SAVANI UNIVERSITY

Fifth Semester of B.Sc. Examination

Dec.-Jan.-2020-2021

SSES3210–Waste Utilization

06.01.2021, Wednesday Time: 10:00 am. to 12:30p.m. Maximum Marks: 60

Section-A (Total Marks - 20)

Q.1 Objectives (20 MCQ Compulsory-1 mark each) **(20)**

1 When a product is recycled into something of lower quality than its original form, it is called _____.

- **A** Recycling
- **B** Up-cycling
- **C** Down cycling
- **D** None of the above

2 What is include in poisonous waste?

- **A** Sulphides
- **B** Cynides
- **C** Chloride
- **D** Ammonia

3 In secure landfill, the sides of designed pit are lined with an _____.

- **A** Semipermeable membrane
- **B** Impermeable membrane
- **C** Permeable membrane
- **D** All of the above

4 A plastic bottle that is recycled into a fleece sweater would be example of which cycling?

- **A** Up- cycling
- **B** Down cycling
- **C** Linear cycling
- **D** None

5 Which treatment option is LEAST effective in treating sugar industry wastewater?

- **A** Anaerobic digestion + lagoon
- **B** Anaerobic lagoon + stabilization pond
- **C** UASB reactor + Waste stabilization
- **D** Activated sludge process + Trickling filters

6 Which of the following is the correct sequence of processing stages in textile manufacturing industry?

- **A** Sizing - desizing - scouring - bleaching
- **B** desizing – sizing - scouring - bleaching,
- **C** scouring - desizing - sizing - bleaching
- **D** Bleaching - desizing – sizing - scouring

7 Ultra-filtration has a pore size of approximately _____.

- **A** 0.03 to 10 microns
- **B** 0.002 to 0.1 micron
- **C** 0.001 micron
- **D** > 5 micron

8 Dairy wastewater contains high concentration of:

- **A** Nutrients
- **B** Organics
- **C** Inorganics
- **D** All of the above

9 About ____ reduction in pollution load and __ reduction in effluent volume in chipper house can be achieved through effluent reuse.

- **A** 80-90% and 70%

B 10-20% and 50%
C 30-40% and 70%
D 50-60% and 80%

10 Adsorption or precipitation of contaminants onto the plant roots that are in solution is:
A Phytostimulation
B Phytostimulation
C Rhizofiltration
D None

11 According to National Waste Management Council - MoEF, how much brine mud is produced from caustic soda industry?
A 0.02 million tonnes per annum
B 0.005 million tonnes per annum
C 50 million tonnes per annum
D 100 million tonnes per annum

12 A two-tier approach for waste management should be:
A Prevention
B Control of environmental pollution
C Both A & B
D None

13 The energy transfer between the hot fluid and cold fluids is brought about by their complete physical mixing in
A Direct contact heat exchanger
B Regenerators
C Recuperators
D Boilers

14 Which of the following is NOT an example of recuperators type heat exchanger?
AAutomobile radiators
B Condensers
C Chemical factories
D Oil heaters for an aero plane

15 Capacity ratio is defined as the product of:
A Mass and specific heat
B Mass and temperature
C Time and temperature
D None

16 Factor affecting waste heat recovery feasibility:
A Heat quantity
B Heat quality
C Operating schedules
D All of the above

17 _____ acts as a significant part in worldwide trading of carbon with its strong, perfect and straightforward production technology.
A Adsorption
B Incineration
C Biochar sequestration
D Bioremediation

18 _____ systems are especially suited for high temperature applications with dirty exhausts.
A Recuperators
B Regenerators
C Heat wheels
D All of the above

19 _____ emission is cited as an issue from incineration
A Dioxin
B Carbon

C Sulphur
D Nitrogen

20 Typical waste heat temperature range for steam boiler exhaust is:
A 230 - 480 degree celsius
B 425 - 650 degree celsius
C 315 - 600 degree celsius
D 650 - 1000 degree celsius

Section-B (Total Marks - 40)

Q.1 Short Notes (attempt all four compulsory- 3 marks each) **(12)**

A Explain dry and oxidizing pyrolysis

B Describe any 3 waste heat sources and uses of waste heat.

C Write classification of pollutants in textiles.

D Write a note on cleaner production hierarchy

Q.2 Explain in detail (attempt any four-7 marks each) **(28)**

A What are heat exchangers? explain any two in detail.

B What are waste heat recovery technologies? Explain recuperators.

C Define landfill. Explain any two methods by which landfilling can be done.

D Explain any two: phytotransformation, rhizodegradation, phytoextraction

E Discuss the process involved in textile processing and the main pollutants from each step.