B. Tech. I SEMESTER I (Divisions A, B, C, D, E, F, G) CEME 106 S1 ENERGY AND ENVIRONMENTAL ENGINEERING

* Required

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End Semester Exam
19th March 2021

Time for attempting: 90 minutes (09:30 am to 11:00 am)

Marks: 75
Questions: 75

Instructions:
(a) Each question carries 1 mark.

_____ pyramid gives the best overall picture of functional aspects of ecosystem. *

- (●) Energy
- ( ) Bio-mass
- ( ) Number
- ( ) None of these

The major source of SO_2 and NOx in the atmosphere is / are *

- ○ Vehicles and automobiles.
- ○ Oil refineries and petrochemical industires.
- ◉ Burning of fossil fuels to generate electricity.
- ○ All of them

Which of the following component is NOT involved in Air Conditioner? *

- ○ Condenser
- ○ Expansion Device
- ○ Compressor
- ◉ Turbine

Suspended solids in air, less than 1μm in diameter, normally released from chemical or metallurgical processes are known as _____. *

- ○ Mist
- ○ Smoke
- ◉ Fumes
- ○ Dust

Solar Cells are made of *

- ○ Aluminium
- ◉ Silicon
- ○ Germanium
- ○ Silver

Which of the following is NOT a component of Solar Water Heater? *

- ○ Water storage tank
- ○ Reflector
- ◉ Gas Holder
- ○ Evacuated tube

In BOD, it is assumed that oxidation is usually _____ complete after 5 days. *

- ◉ 70%
- ○ 50%
- ○ 99%
- ○ 20%

In acoustics, as the distance is halved, the sound pressure (in dB) of a spherical wavefront radiating from a point source _____. *

- ○ Decreases by 50%
- ○ Decreases by 25%
- ◉ Increases by 100%
- ○ Increases by 200%

Which of the following is water purification technology ? *

- ◉ All of these
- ○ Sedimentation filtration
- ○ Ion exchange
- ○ Activated carbon towers

R/P ratio is called as *

- ○ Recovered to Produce ratio
- ○ Reuse to Produce ratio
- ◉ Reserves to Production ratio
- ○ None of these

The primary energy consumption of India is _____ *

- ○ 1/20 of the world
- ◉ 1/29 of the world
- ○ 1/16 of the world
- ○ 1/7 of the world

Noise level at a busy traffic intersection of a city was recorded as 78.1 dB. Convert the same into Pa. *

- ○ 160.705 Pa
- ◉ 0.1607 Pa
- ○ 0.001607 Pa
- ○ 160705.22 Pa

_____ does not play a significant role in Phosphorus cycle. *

- ○ Hydrosphere
- ○ Lithosphere
- ◉ Atmosphere
- ○ None of these

NOx is the most commonly emitted air pollutant from _____. *

- (●) Coal based power station
- ( ) Gas based power station
- ( ) Lignite based power station
- ( ) None of these

_____ the food chain, more will be the available energy *

- (●) Shorter
- ( ) None of these
- ( ) Longer
- ( ) Average

As per the Supreme Court judgment, _____ emission standards for motor vehicles are discontinued from April 1, 2020 in India. *

- (●) Bharat Stage IV
- ( ) Bharat Stage V
- ( ) Bharat Stage VII
- ( ) Bharat Stage VI

_____ is an example of non-renewable energy. *

- ○ Sunlight
- ○ Geo-thermal
- ○ Wind
- ◉ None of these

_____ is a cradle-to-grave or cradle-to-cradle analysis technique to assess environmental impacts associated with all the stages of a product's life. *

- ◉ Life cycle assessment
- ○ EIA
- ○ None of these
- ○ Environmental Audit

Air quality standard for SO2 is 80 µg/m3. Convert this into ppm at 1 atmospheric pressure and 25oC. (Molecular weight of SO2 is - 64 g/mol) *

- ○ 30.56 ppm
- ○ 3.056 ppm
- ○ 0.3056 ppm
- ◉ 0.03056 ppm

In waste water treatment, reverse osmosis and electro-dialysis are examples of *

- ○ Pre-treatment
- ○ Secondary Treatment
- ◉ Tertiary Treatment
- ○ Primary Treatment

1 tonne of oil equivalent is _____. *

- ○ 11.63GJ
- ○ 42MWhr
- ◉ 11.63MWhr
- ○ 210GJ

From most to least favored, what is the order of waste management hierarchy ? *

- ○ Prevention-Reuse-Disposal-Recycle
- ○ Prevention-Disposal -Reuse-Recycle
- ◉ Prevention-Reuse-Recycle-Disposal
- ○ Prevention- Recycle-Reuse- Disposal

_____ is an international treaty to limit and reduce greenhouse gases (GHG) emissionsby industrialized countries and economies. *

- ○ Rio Declaration
- ○ The Montreal Protocol
- ○ The Paris Agreement
- ◉ The Kyoto Protocol

Sewage discharge in cities and towns is an example of _____ water pollution. *

- ○ Area source
- ○ Non-point source
- ◉ Point source
- ○ None of these

The process of nutrient enrichment in surface water bodies, due to waste water is known as _____. *

- ○ Biodiversity
- ○ None of these
- ○ Bio-magnification
- ◉ Eutrophication

How should be the ignition temperature of an ideal fuel? *

- ○ Low
- ○ Very low
- ◉ Moderate
- ○ Very high

Why are plastics difficult to recycle? *

- ○ Because it is very adhesive in its nature
- ◉ Because of different types of polymer resins
- ○ Because of the different sizes of plastic
- ○ Because it is a very hard material

The sampling and analysis of various environmental components of industry is carried out atleast _____ in one year. *

- ○ None of these
- ○ Once
- ○ Thrice
- ◉ Twice

Which gas / compound has got the maximum global warming potential (GWP)? *

- (●) Sulphur Hexa Fluoride
- ( ) Carbon Di-oxide
- ( ) Nitrous Oxide
- ( ) Hydro Fluoro Carbons

One of the advantages of solid fuel is *

- ( ) Ash formation
- (●) Ease of transport
- ( ) Requirement of excess air
- ( ) Low calorific value

_____ frequency is inaudible to human ears. *

- ( ) B. >20,000 Hz
- ( ) A. <20Hz
- ( ) D. None of these
- (●) Both (A) & (B)

Energy is defined as the _____. *

- ○ Lifting the body
- ○ Displacement of a body with force
- ◉ Capacity to do work
- ○ None of these

With reference to EIA Rules-2006, which sequence is correct ? *

- ○ Screening-Scoping-Appraisal-Public Consultation
- ○ Scoping-Screening-Appraisal-Public Consultation
- ○ Scoping-Screening-Public Consultation--Appraisal
- ◉ Screening-Scoping-Public Consultation-Appraisal

In which sphere, ozone layer depletion is found? *

- ○ None of these
- ◉ Stratosphere
- ○ Ionosphere
- ○ Lithosphere

The ozone layer absorbs what range of wavelengths of the sun's radiation? *

- [x] 200 nm – 315 nm
- [ ] 450 nm – 570 nm
- [ ] 0.80 nm – 1.50 nm
- [ ] 600 nm – 750 nm

The main constituent of Biogas is _____ *

- [ ] O_2
- [ ] CO
- [ ] H_2S
- [x] CH_4

Which waste will decompose in less than six months if left outside? *

- [ ] cigarette butts
- [ ] plastic or glass bottles
- [x] food, leaves, grass clippings
- [ ] aluminum or steel cans

Which of the following is not a greenhouse gas? *

- ○ Water vapor
- ○ Carbon dioxide
- ○ Methane
- ◉ Ethane

Ozone depletion potential is given with reference to _____ *

- ○ A. CO
- ○ B. CO_2
- ○ C. Both (A) & (B)
- ◉ D. CFC

Permissible norms for night time noise for silence zones is _____ dB. *

- ○ 65
- ◉ 40
- ○ 55
- ○ 45

COP is *

- ○ Output/ Input
- ○ Work input/ Heat Supplied
- ◉ Desired Effect/Work Input
- ○ Work Done/Heat Supplied

Choose the incorrect statement regarding wind power. *

- ○ It is expected to harness wind power to minimum in open space.
- ○ Wind hitting the blades of a windmill causes them to rotate. The rotation thus achieved can be utilised further.
- ○ One possible method of utilising the energy of rotational motion of the blades of a windmill is to run the turbine of an electric generator.
- ◉ The potential energy content of wind blowing at high altitudes is the source of wind power.

Fossil fuels like coal, oil and natural gas are *

- ◉ Commercial energy sources
- ○ Non-conventional energy sources
- ○ None of these
- ○ Non-commercial energy sources

In biotic components of an ecosystem structure, producers are also known as _____. *

- ○ None of these
- ○ Heterotrophs
- ○ Saprotrophs
- ◉ Autotrophs

Resettlement and rehabilitation (R&R) of persons is very significant for which type(s) of project(s) ? *

- ○ A. Highways & Expressways
- ○ D. None of these
- ○ B. Dams
- ◉ C. Both (A) and (B)

From the water pollution perspective, _____ is a heavy metal. *

- ◉ All of these
- ○ Lead
- ○ Arsenic
- ○ Cadmium

The sum of all emissions of carbon dioxide which were induced by an entity's activities in a given timeframe is called _____ *

- ○ Carbon sinks
- ○ None of these
- ○ Carbon Intensity
- ◉ Carbon Footprint

Pollution Under Control (PUC) certificate for automobiles is issued under _____ *

- ○ Air (Prevention & Control of Pollution) Act-1981
- ○ None of these
- ○ Environment Protection Act-1986
- ◉ Indian Motor Vehicles Rules-1989

_____ is the driving push for energy storage. *

- ◉ All of these
- ○ Grid modernization
- ○ Cost and performance improvement
- ○ Global movement towards renewable

The most recent agreement for dealing with greenhouse gas emissions mitigation, adaptation and finance is _____ . *

- ○ The Kyoto Protocol
- ○ The Montreal Protocol
- ◉ The Paris Agreement
- ○ Rio Declaration

Scoping in EIA is done to _____ *

- ○ D. None of these
- ○ B. Finalize the terms of reference (TORs)
- ◉ C. Both (A) & (B)
- ○ A. Identify the key and significant environmental

Which of this is an example of secondary air pollutant? *

- ○ Dust
- ◉ SO_3
- ○ Hydrocarbons
- ○ SO_2

4 ml of waste water is diluted to 300 ml distilled water in standard BOD bottle. After 5 days, the dissolved oxygen content had dropped to 1.1 mg/L and BOD5 value obtained was 118.5 mg/L. Determine the initial DO value. *

- ○ 0.48 mg/L
- ◉ 2.68 mg/L
- ○ 4.68 mg/L
- ○ 5.23 mg/L

_____ is the main constituent of ATP & ADP and is very essential for the growth of plants. *

- ○ Sulphur
- ○ Nitrogen
- ◉ Phosphorus
- ○ Carbon

Lowest temperature at which fuel can be heated so that vapour gives off sparks is known as _____. *

- ○ Ignition temperature
- ◉ Flash point
- ○ Adiabatic temperature
- ○ Pour point

The pH of natural rain is found to be in the range of _____. *

- (●) 5 to 7
- ( ) 7 to 9
- ( ) 3 to 5
- ( ) Neutral - 7

_____ is the programme which initially focusses on the energy efficiency improvement in unauthorized sectors like domestic and agriculture? *

- ( ) Designated consumers
- (●) Standards and Labelling
- ( ) None of them
- ( ) Energy conservation building codes

Watt is a unit of _____. *

- (●) Sound power
- ( ) Sound pressure level
- ( ) Sound pressure
- ( ) None of these

Acid rain is harmful to terrestrial vegetation, mostly because it leaches nutrients such as _____ and allows them to exit the ecosystem by runoff. *

- (●) Potassium
- ( ) Phosphorus
- ( ) Cadmium
- ( ) Chromium

Advantages of liquid fuel in comparison to solid fuel is/are _____. *

- (●) All of these
- ( ) High calorific value
- ( ) Requires less space for storage
- ( ) Easy handling and transportation

The Act which has been enacted to provide for efficient use of energy and its conservation and for matters connected therewith is? *

- ( ) Energy Conservation Act 2007
- ( ) Indian Electricity Act 2003
- (●) Energy Conservation Act 2001
- ( ) Indian Electricity Act 2010

Primary batteries are based on *

- ○ Anaerobic reaction
- ◉ Electrochemical reaction
- ○ Isothermal reaction
- ○ Water gas shift reaction

NITI stands for *

- ○ National Institution for Transformed India
- ◉ National Institution for Transforming India
- ○ New India Transformed Initiative
- ○ None of these

Which fuel is used widely in steam power plants? *

- ○ Gas
- ○ Petroleum
- ◉ Coal
- ○ Oil

_____ is an essential element for living organisms for synthesizing amino-acids, vitamins etc. *

- ( ) Carbon
- (•) Nitrogen
- ( ) Phosphorus
- ( ) Sulphur

_____ is the nodal agency of Central Government responsible for the implementation of EIA Notification. *

- (•) MoEF&CC
- ( ) CPCB
- ( ) None of these
- ( ) SPCB

Which of the following is NOT used in Solar Water Heating System? *

- ( ) Pressure Relief valve
- (•) None of these
- ( ) PV Panel
- ( ) Collector

Measurement of BOD (Biological Oxygen Demand) is primarily used for _____ *

- ○ None of them
- ○ Determine level of DO
- ◉ Estimating the quantity of organic matter in waste water
- ○ Estimating the types of microbes

BEE stands for *

- ◉ Bureau of Energy Efficiency
- ○ Bureau of Efficient Energy
- ○ None of these
- ○ Bureau of Energy and Environment

In a food chain, if the amount of energy at the tertiary consumers level is 5 kJ, what will be the energy available at the producer level? *

- ◉ 5000 kJ
- ○ 50 kJ
- ○ 5 kJ
- ○ 500 kJ

Which among them is main pollutant in soil? *

- ○ Nitrogen and phosphorous
- ○ All of them
- ◉ Heavy metals and metalloids
- ○ Pesticides

What is the benefit of conducting EIA? *

- ○ Identifies feasible alternatives
- ○ Predicts significant adverse impacts
- ○ Screens out environmentally-unsound projects
- ◉ All of them

Fuels are classified as primary and secondary fuel based on the _____ *

- ◉ Occurrence
- ○ State
- ○ Capacity to burn
- ○ Availability

Which of the following is an example of secondary fuel? *

- ○ Wood
- ○ Lignite coal
- ○ Natural gas
- ◉ Gasoline

The SI unit of energy is _____ *

- ○ Kilogram/meter
- ○ Calorie
- ○ Kilogram
- ◉ Joule

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