

[49] Sardar Patel University, Vallabh Vidyanagar

M.Sc. Environmental Science and Technology

Course: Occupational and Environmental Toxicology Course no: PS2CEST03

Date: 11th April, 2017

Time: 10.0 – 1.00 pm

Max.marks:70

N.B. Draw neat labelled diagrams wherever necessary

Q1. Answer the following multiple choice questions

(8X1)

a. The chemical formula of Chlorophyll- b is

i. $C_{55}H_{72}O_5N_4Mg$ ii. $C_{55}H_{70}O_6N_4Mg$ iii. $C_{55}H_{72}O_5N_4Mg$ iv. $C_{55}H_{70}O_5N_4Mg$

b. Krebs cycle occurs in

i. Cytoplasm of the cell ii. Mitochondria iii. Matrix of Mitochondria iv. all

c. Kranz anatomy is observed in which plants

i. C3 plants iii. C4 plants iii. CAM plants iv. None

d. The blood clotting is formed due to the formation of

i. Fibrin ii. Thrombin iii. Prothrombin iv. Fibrinogen

e. Second Largest organ of the body

i. Liver ii. Intestine iii. Lungs iv. None

f. Portal tree is a part of following organ of the body

i. Kidney ii. Heart iii. Brain iv. none

g. Heart beat is mainly initiated by

i. SA node, ii. Perkinj fibers iii. HIS bundles iv. AV node

h. Byssinosis disease is caused by

i. Iron ii. Bauxite. iii. Coal iv. None

Q2. Answer any SEVEN of the following

(7X2)

- Sweat glands
- Conversion of Pyruvic acid into Acetyl CO- enzyme A
- Structure of Muscular tissues
- Structure of Nerve cell
- Structure of Rods and Cones
- Endocrine disrupters
- Structure of Glial cells
- Effect of n- Hexane and CS_2 on CNS.

Q3. A. What is ADME and explain in details when exposed to chemicals or toxicants (6)

B.i.Explain LC_{50} in details (3+3)

ii. Enlist general carcinogens causing type of cancers and first aid treatments

OR

B.i. Enumerate Acute toxicity (3+3)

ii. Discuss Dose- Response by giving suitable examples

Q4. A. Discuss industrial toxicants producing pulmonological diseases (6)

B. Describe structure of Nephrons, glomerule and add a note on functions of Kidney .

(6)

OR

B. Write a note on Human liver lobules, Gall bladder and Pancreas (6)

Q5.A. Enumerate the Human Neurotoxic diseases caused due to exposure to different chemicals. (6)

.B.i.Explain structure of Human Eye with a neat and lebeled diagram (6)

OR

B.i. Explain how one glucose molecule splits into two molecules of Pyruvic acids (3+3)

ii. Write a note on Cyclic photophosphorylation pathway in detail

Q6.A. Decribe various of Cardiotoxic diseases caused at occupational areas (6)

B i. Discuss generalized morphological responses of plants to various herbicides (3+3)

ii. Describe various heavy metals to cause lung diseases in occupational areas.

OR

B. Write a note on i. Heavy metal effects on Human Kidney (3+3)

ii. Absorption of herbicides in Plants in general .

Sardar Patel University, Vallaibh Vidya Nagar

SEAT No. _____

No. of Printed Pages : 02

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SARDAR PATEL UNIVERSITY

M.Sc. (Environment Science & Technology)

SEMESTER – II

EXTERNAL EXAMINATION (April 2017)

PS02CEST07: Remote Sensing and Geographical Information System

Date: 13-04-2017

Marks: 70

Time: 10:00 am to 01:00 pm

Q.1 Answer all questions

(8 Marks)

(A) Remote sensing data is characterized by _____ types of resolutions

- a. 2 b. 3 c. 4 d. 6

(B) Components of GIS are _____

- a. 4 b. 3 c. 5 d. 6

(C) Reflectance / digital number in remote sensing data is maximum for _____

- a. Water b. Forest c. Snow d. Desert Land

(D) GPS provides information about _____

- a. Position b. Timing c. Velocity d. All a, b, c

(E) Remote sensing data from 36000 km orbit are primarily used for _____

- a. Urban Planning b. Cyclone Warning c. Navigation d. Drought Assessment

(F) The major error in consumer grade navigation GPS receiver is _____ error

- a. Receiver Clock b. Multipath c. Ionospheric Delay d. Tropospheric Delay

(G) The most popular GPS-GIS combined application is _____

- a. Route Navigation b. Data Collection c. Data Visualization d. Data Validation

(H) Visual image interpretation is based on _____

- a. Size & Shape b. Tone & Texture c. Pattern d. All a,b,c

Q.2 Answer any seven questions

(14 Marks)

1. Define remote sensing and any two remote sensing data resolution
2. Briefly explain urban sprawl monitoring using remote sensing data
3. State major five advantages of GPS technology
4. Define GIS and what are 4M functions of GIS?
5. Define map projection and list four associated errors
6. What is thermal and active remote sensing and list two major advantages of both
7. Explain non-spatial attributes data types
8. Write meaning of map scale and list two characteristics of large and small scale map
9. Define Tuple, Topology, Cadastre and Metadata

Q.3 (a) Explain major differences between MAP and GIS (6 Marks)

(b) Describe use of remote sensing data in environment monitoring (6 Marks)

OR

(b) Describe GPS space, control and user segments (6 Marks)

Q.4 (a) Explain six GIS data quality parameters (6 Marks)

(b) Explain GIS merge and elimination functions with diagram (6 Marks)

OR

(b) Describe role of RS and GIS in drought monitoring

Q.5 (a) What is image classification and explain supervised classification (6 Marks)

(b) Explain positional errors in GIS database with diagrams (6 Marks)

OR

(b) Write note on primary and secondary GIS databases (6 Marks)

Q.6 (a) Explain GIS Raster and Vector data model (6 Marks)

(b) Describe all six stages of passive remote sensing from energy source to data products in details (6 Marks)

OR

(b) Explain any two algebraic functions for 3X3 raster data (6 Marks)

SARDAR PATEL UNIVERSITY
M.Sc. (EST) (Second Semester) Examination
Monday, 17 April, 2017
10.00 am to 1.00 pm

PS02CEST08: Meteorological & Environmental Instrumentation and its Applications

Max. Marks: 70

Q.1. Multiple Choice Questions (Choose Correct Answer)

[08]

- (1) Following is not an active form of GHG occurs naturally in earth's atmosphere.
 (a) N₂O (b) CH₄ (c) CO₂ (d) Water vapor
- (2) Following sector forms the least proportionate volume in annual GH emissions.
 (a) Fossil fuel retrieval (b) Residential & commercial
 (c) Land use & biomass burning (d) Waste disposal & treatment
- (3) _____ source emits the minimum amount of N₂O in atmosphere.
 (a) Industrial processes (b) Waste disposal & treatment
 (c) Residential & commercial (d) Power stations & Transportation fuels
- (4) Commonness of data is achieved using _____.
 (a) Column graph (b) Bar graph (c) Histogram (d) Ogive
- (5) FID detector can detect _____.
 (a) SO₂ (b) CH₄ (c) N₂O (d) CO₂
- (6) Freezing point of Mercury is _____.
 (a) -37.5 °C (b) -38.8 °C (c) -37.8 °C (d) -38.5 °C
- (7) In flame photometer, K metal emits _____ color of light on heating.
 (a) Yellow (b) Orange (c) Lime green (d) Violet
- (8) Refractive index detector used in following instrument.
 (a) GC (b) HPLC (c) Flame Photometer (d) UV-VIS

Q.2. Write a Short Note on followings (Any Seven).

[14]

- (1) Define the terms: Span, Linearity, Error, Damping
- (2) Differentiate between weather, climate, climate variability, and climate change
- (3) Draw pie-charts (General, CO₂, CH₄, N₂O) of annual GHG emissions
- (4) Enlist types of graphs used in biostatistics with its applications
- (5) Expand the terms: IPCC, WMO, UNEP, NMHS
- (6) Introductory note on Biostatistics
- (7) Sediment sampler (Van Veen Grab)
- (8) Types of centrifuges
- (9) Working pattern of wind vane

- Q.3. (a) Explain the potential role of CO₂, CH₄, and N₂O in climate change.**

[06]

- (b) Describe any three natural factors for climate change in detail.**

[06]

OR

- (b) Describe any three anthropogenic factors for climate change in detail.**

[06]

- Q.4. (a) How can we combat the climate change? Explain.**

[06]

- (b) Find out S.D. of Simple Series (16, 13, 17, 22), and Continuous Series (10, 11, 12, 13, 14, 15, 16; Frequency: 2, 7, 11, 15, 10, 4, 1).**

[06]

OR

- (b) Following are results of height and weight of 1000 students. Mean height (y) = 170 cm, Mean weight (x) = 60 kg, r = 0.6, σ_y = 6.5 cm, σ_x = 5 kg, Anil's weight = 45 kg, Sunil's height = 165 cm. Estimate the height of Anil from his weight and weight of Sunil from his height.**

[06]

- Q.5.** (a) Define SVP. Describe different techniques of humidity measurement in detail. [06]
(b) How can we measure minimum temperature? Explain working of respective instrument. [06]
Add a note on working of mercury barometer.

OR

- (b) Explain different instruments used in measurement of sunshine. [06]

- Q.6.** (a) What do you mean by atomic emission spectroscopy? Explain working and construction of ICPAES with diagram. [06]

- (b) Explain solvent delivery system in HPLC. Add a note on different parts of light compound microscope. [06]

OR

- (b) Explain atomization process of sample in AAS. Discuss different sources used in IR spectroscopy. [06]

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SARDAR PATEL UNIVERSITY
M.Sc. (EST) (Second Semester) Examination

Wednesday, 19 April, 2017

10.00 am to 1.00 pm

PS02EEST03: Industrial Hygiene and Occupational Health

Max. Marks: 70

[08]

Q.1. Multiple Choice Questions (Choose Correct Answer)

- (1) Following is not an example of non-ionizing radiation.
(a) IR (b) Microwave (c) X-rays (d) LASER
- (2) Following is a causative factor for ionizing radiation.
(a) IR (b) Microwave (c) Neutrons (d) LASER
- (3) Following is the best example of opportunistic ingestion.
(a) Eating Manchurian (b) Drinking Faluda
(c) Sipping Water (d) Taking Dinner
- (4) Following is uncommon route of entry of chemicals into your body.
(a) Ingesting food (b) Sipping water
(c) Percutaneous absorption (d) Inhalation of gases
- (5) Following is the most suitable to Bagassosis.
(a) Occupational Silicosis (b) Occupational Bysinosis
(c) Occupational Asthma (d) Occupational Asbestosis
- (6) Following is not an ancient metal.
(a) Pb (b) Hg (c) Be (d) Zn
- (7) TLV of CO for 8 hours is _____ ppm.
(a) 10 (b) 30 (c) 50 (d) 70
- (8) GFR rule for an ambulance van is _____.
(a) 68 T (b) 68 F (c) 68 V (d) 68 G

Q.2. Write a Short Note on followings (Any Seven).

[14]

- (1) Define: Occupational Health (OH), Industrial Hygiene (IH)
- (2) Differentiate between Hazard and Risk
- (3) Draw triangles of hierarchy of controls
- (4) Flowcharts: Types of Air Contaminants, Particulates
- (5) Goals of ergonomics
- (6) Health effects of chemical hazards
- (7) Note on Mist and Sensitizers
- (8) Purpose, Recognition, Evaluation and Control of IH
- (9) Schedules in The Factory Act, 1948

Q.3. (a) Write a detailed note on physical and chemical hazards.

[06]

(b) Discuss types of hazardous effects.

[06]

OR**(b) Enlist, explain and exemplify: Notifiable occupational diseases**

[06]

Q.4. (a) Write a detailed note on industrial gases and their effects on human health.

[06]

(b) Write a note on types, health hazards, and effects of industrial dusts.

[06]

OR**(b) Expand & Explain: TLV, TWA, STEL, PEL, IDLH, AOTL**

[06]

- Q.5.** (a) Briefly describe hierarchy of control at industrial scale. [06]
(b) Discuss basic principles, man-machine interaction, and major heads of ergonomics. [06]
- OR**
- (b) Write a detailed note on PPEs (requirements, need, selection criteria), and types of RPEs. [06]
- Q.6.** (a) Write a brief note on ideal working station. Add a note on importance of respirators. [06]
(b) Briefly explain health concerns in cement industry. Add a note on industrial ventilation. [06]
- OR**
- (b) Discuss safety measures against boiler fires and explosion. Add a note on periodic health examination and termination examination. [06]

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