08/05/2024 Day: Wednesday

Good
Suggestions
Increase length of theory portion
Add more headings
Draw neat diagrams
Good for math work

Mock Exam I

Part II

Section-1:

Question-5:

q. How Cyclones are formed? Discuss

Ans: Cyclone: A system of rotating winds around the low pressure core due to pressure gradient and coriolis force of the Earth.

Types:
- Tropical cyclone
- Extra tropical Cyclone

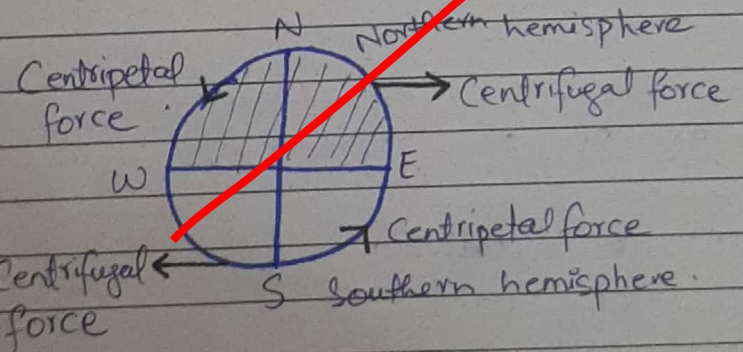
Formation of Tropical Cyclone:

Pressure Gradient: Tropical cyclones feed on heat from moist air and Earth's condensation. 27° Celcius temperature of water is ideal for cyclone formation. As warmth is gathered by the low-winds from water, energy is transfered to the atmosphere and precipitation occur. Cloud is also formed. This warm air make it like a hot air balloon and more air enters inside.

Coriolis Force: Now the air in the northern hemisphere is cool so it keep rushing toward the centre due to low pressure zone. This creates a spin in a counter-clockwise direction.

Formation of Extra Tropical / Mid-latitude Cyclone:

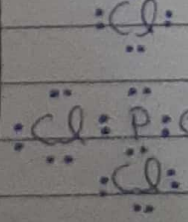
The cold and hot air meet at the boundary called front. It is a low pressure region. This forms as dense cold air displaces the rising warm air. This interaction generates an eastward jet stream and an anti-clockwise circulation pattern. The cold dry air from pole fills the upper atmosphere. This creates an extro tropical cyclone.



b. Differentiate between Ionic and covalent bonds

Ans:

Ionic Bond	Covalent Bond
Formation	
Ionic Bond are formed between a metal and	Covalent Bonds are formed between non-metals

a non-metal. In ionic bond electrons are transfered from one atom to another to achieve stability. This results in formation of ions	In covalent bond, atoms share one or more pairs of electrons to achieve stability
Nature	
Ionic bond is characterized by electrostatic attraction between positively charged ion (cations) and negatively charged ion (anions).	Covalent bond is characterized by the sharing of electrons between atoms
Bond Strength	
Ionic bonds are not as strong as covalent bond	Covalent bonds are strong and need energy to break.
Physical Properties	
Ionic bond has high melting and boiling points due to the strong electro-static forces.	Covalent bond has low melting and boiling point.
Example	
$Na^{\cdot} + :\ddot{Cl}: \rightarrow Na^{+}\ [:\ddot{Cl}:]^{-}$	$:\ddot{Cl}\cdot + \cdot\dot{P}\cdot + \cdot\ddot{Cl}: \rightarrow$ 

c. Give the uses of Gamma Rays, X-Rays

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and Radio waves.

Ans: Uses of Gamma Rays:

1- Gamma rays are used in radiation therapy to treat cancers. They are directed toward tumor cell and kill them or stop their growth.

2- Gamma rays are used in industrial radiography for non-destructive testing of materials such as pipelines.

Uses of X-rays:

1- X-rays are used in medical diagnostics It is used to detect bone fracture, organ and tissue damage.

2- X-rays machine are used by airport security to scan luggage for prohibited items.

Uses of Radio waves:

1- Radio waves are used for long distance communication including radio broadcaste and TV transmissions.

2- Radio waves are utilized in radar system It is used in air traffic controls etc

d. What are tides? Write a note L.E.D

Ans: Tides:

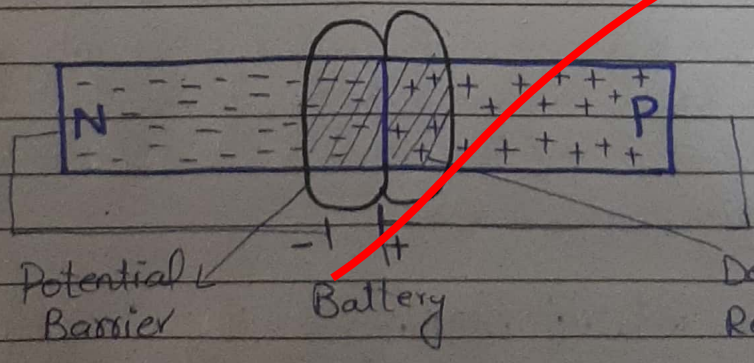
Tides are periodic rise and fall of sea level primarily caused by the gravitational forces of moon. This gravitational pull of moon causes the formation

of two high tides and two low tides each day as earth rotates. Tides play an important role in various natural phenomena such as coastal erosion etc.

L·E·D:

L.E.D or Light Emitting Diodes are semi-conductor devices that emit light when an electric current passes through them.

- LEDs have high efficiency as compared to traditional light source.
- LED's have longer life span compared to normal light source.
- LED's illuminate instantly and do not take time to warm-up.
- LED's contain no toxic material such as mercury. So they are environmet friendly



Question-2

a. Differentiate between climate and environment What are the causes of air pollution in

Pakistan?

Ans:

Climate:

1. Climate refers to the long term weather condition in a particular region including temperature, precipitation etc.
2. Climate is influenced by global phenomena such as Earth's orbit, solar radition.

Environment:

1. The environment includes all living organisms, their habitat and the physical surrounding in which they interact. Biotic and abiotic both are included in it.
2. The environment is only effected by natural processes but also human activities such as industrialization, deforestation, pollution can affect it.

Causes of air pollution in Pakistan:

1. **Vehicles Emissions:** The rapid increase in number of vehicles contribute to the air pollution of Pakistan. The country has high number old and poorly maintained cars that releases carbon monooxide, nitrogen oxide etc.

2. **Agricultural Burning:** Burning of crop residue is another cause of air pollution in Pakistan. This releases large quantity of pollutants like particulate matters and Coetc

b. Write a note on vitamin and their role in body?

Ans: Vitamins:

Vitamins are essential organic compounds required in small amount for various biochemical processes in the human body. They play a crucial role in maintaining and well-being of body.

Role of vitamins in Human Body:

Vitamin A: It is essential for vision, skin health. Sources of vit A are yellow coloured and orange coloured fruits.

Vitamin D: It is essential for teeth and bones formation. Sources are milk, sunlight

Vitamin E: It is important for healthy skin and hairs. Also slow down the process of aging. Sources are green leafy vegetables

Vitamin k: It is important for bones healing. Also it prevent blood clotting. Sources include cabbage and cauliflower.

→ All above mentioned vitamins are fat soluble vitamins which means they are only dissolved in fats.

Vitamin B complex: These are important for growth, immune system and reproduc

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ctive functions. Sources are fish, dry fruits and milk.

Vitamin C: This is essential for bone and wound healing. Sources of vit C are citrus fruits (i.e oranges, apple and pineapple.

→ Above mentioned vitamins are called water soluble vitamins because they are dissolved in water.

c. Compare goals of COP27 and COP28 on climate change.

Ans: Loss and Damage Fund: COP27 established and operationlized a loss and damage fund COP28 built on this decision by securing funds of over 600 million dollars.

Key outcome: COP27 ended with the establishment of loss and damage fund. COP28 concluded with the decision to accelerate climate action before 2030. It also highligh the transitioning from fossil fuel

Focus: COP27 focused on adaptation and resilience. while COP28 focused on mitigation and energy transition.

Participation: COP28 has more participation

rate than COP27. 150 heads of state and government participated in COP28

d. What are active and passive sensors? How these are used in G.I.S?

Ans: Active Sensor:

1. Active sensors emit their own radiation or energy.
2. They measure the responce that is reflected or emitted from the Earth's surface.
3. Examples are radar.

Passive Sensor:

1. Passive sensors detect natural radiation emitted or reflected by the Earth's surface without emitting light themselves.
2. They rely on external source of energy such as sunlight.
3. Examples are camera and radiometers.

Their usuage in G.I.S:

The Geographic Information System (G.I.S) uses both sensors. Active sensors are used in G.I.S for terrain mapping, land cover and vegetation monitoring. Passive sensors are used for tasks like land cover mapping, urban planning with help of satellites and cameras.

Section-II

Question-6:

a. Radius of cylinder is 8cm and height is 15cm. Find its volume.

Sol: Given Data:

Radius of cylinder = 8cm

Height of cylinder = 15cm

Required Data: Volume of cylinder = ?

Formula: volume = $\pi r^2 h$

Putting the values in formula.

$$\text{Volume} = \pi (8\text{cm})^2 (15\text{cm})$$
$$= (3.14)(64\text{cm}^2)(15\text{cm})$$
$$= (3.14)(960\text{cm}^3)$$
$$= 3014.4\text{cm}^3 \quad \text{Ans.}$$

b. Al-Aqsa Mosque in Jeruasalem, Israel has a dome of rock in regular octgonal shape. What will be the angle of each side?

Sol: Given Data:

Number of sides of octagon = n = 8

Required Data:

Agle of each side = ?

Formula: Sum of interior angle = s

Sum of interior angle = $(n-2)\times 180$

Putting the value of 'n' in formula.

$= (8-2)\times 180$

$= 6 \times 180$

$= 1080^\circ$

To find the measure of each angle:

Angle of each Side = $\frac{\text{Sum of interior angle}}{n}$

$= \frac{1080}{8}$

$= 135°$ Ans.

c. Maximum length and depth of Dal Lake in Srinagar is 4.6 mile and max width is 2.2 mile. Find surface area of Dal Lakbe.

Sol: Given Data:

Length and depth = 4.6 miles

Width = 2.2 miles.

Required Data:

Surface area = ?

Formula: Surface area = length x width

Putting the values in formula.

Surface Area = 4.6 miles x 2.2 miles

$= 10.12\ m^2$ Ans.

d. A ladder is leaning against the side of a 10m tall house. If the base of ladder is 3m away from house, how tall is the ladder?

Sol: Given Data:

Height of the house = h = 10m

Distance from the base of the ladder to house = b = 3m

Required Data: Height of ladder = $l = ?$

Formula: Pythagoras theorem

$$L^2 = l^2 + b^2$$

Putting the values in formula

$$= (10)^2 + (3)^2$$

$$= 100 + 9$$

$$L^2 = 109$$

Taking square root on both side.

$$\sqrt{L^2} = \sqrt{109}$$

$$L = 10.4 \text{ meters}$$ **Ans.**

Question-8:

a. Write the formula of I.Q. What are the factors which can affect I.Q?

Ans: Formula of I.Q:

$$I.Q = \frac{\text{Mental Age}}{\text{Chronological Age}} \times 100$$

Where

Mental Age = The age at which a person is person performing intellectually.

Chronological Age = The person's actual age in years.

Factors:

1. **Genetics:** Genetic factor play an important role in determining I.Q. Intelligence tends to run in family.

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2- Environment: Environmental factors such as socio-economic status, quality of education etc affect the IQ.

3- Nutrition: Adequate nutrition is important for brain development.

4- Stress and Trauma: Chronic stress can negatively affect the IQ.

b. Find the number of triangles in below equilateral triangle.

Ans: The total number of triangles in below equilateral triangle are 16

c. A letter is choosen at random from the word "Superintendent" what is the probability that world is vowels

Ans: Total number of letter in word = 14

Number of vowel in word = 5

Formula: Probability = $\frac{\text{no of vowels}}{\text{Total number of letters}}$

Putting the value

$= \frac{5}{14}$

$= 0.357$

$= 0.4$ Ans

d. Distribute Rs 4320 among Zain..... get seven parts.

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Sol: **Given Data:**

Total amount = Rs 4320

Ratio = 2 : 3 : 7

Required Data:

Share of each person = ?

First find Total parts = Zain's part + Aslam's part + Ashraf's part

= 2 + 3 + 7

= 12

Formula: Amount per part = $\frac{\text{Total amount}}{\text{Total parts}}$

= $\frac{4320}{12}$

= Rs 360 per part.

Zain's share = 2 (amount per part)

= 2 (360)

= Rs 720 Ans

Aslam's share = 3 (360)

= Rs 1080 Ans

Ashraf's share = 7 (360)

= Rs 2520 Ans.