



National Officers Academy

Mock Exams for CSS-2026

December, 2025 (Mock-5)

General Knowledge-I

General Science & Ability

TIME ALLOWED: THREE HOURS

PART-I (MCQS): MAXIMUM 30 MINUTES

PART-I : (MCQS) MAXIMUM MARKS = 20

PART-II : MAXIMUM MARKS = 80

NOTE:

i. Part-II is to be attempted on the separate Answer Book.

ii. Attempt ONLY FOUR questions from PART-II by selecting TWO questions from EACH SECTION. ALL questions carry EQUAL marks.

PART-II

SECTION-I

Q. 2.

R. (a) Differentiate between a **Star** and a **Planet**. Briefly describe the life cycle of a star from a Nebula to a Black Hole. (5)

(b) What are **Semiconductors**? Explain the difference between n-type and p-type semiconductors and list two of their modern applications. (5)

(c) Define **Global Warming**. Explain the mechanism of the Greenhouse Effect and list three major greenhouse gases. (5)

(d) What is a **Tsunami**? Explain the natural processes that trigger a tsunami and the potential impact on coastal areas. (5) **(20)**

Q. 3.

(a) Describe the structure and function of the **Mitochondria** and **Ribosomes** within an animal cell. Why is the mitochondria often called the "powerhouse" of the cell? (5)

(b) What are **Enzymes**? Explain the "Lock and Key" model of enzyme action and list two factors that affect enzyme activity. (5)

(c) Differentiate between **Renewable** and **Non-Renewable** energy resources. Discuss the potential of **Wind Energy** as a sustainable source for the future. (5)

(d) What is **Dengue Fever**? Describe the vector responsible for its transmission, its common symptoms, and key preventive measures. (5) **(20)**

Q. 4.

(a) Explain the **Rock Cycle**. Differentiate between Igneous, Sedimentary, and Metamorphic rocks with examples. (5)

(b) What is **Acid Rain**? Discuss the chemical reactions involved in its formation and its harmful effects on aquatic life and vegetation. (5)

(c) Discuss the role of **Remote Sensing** and **GIS** (Geographic Information Systems) in environmental monitoring and disaster management. (5)

(d) Explain the concept of **Solid Waste Management**. What are the environmental hazards associated with improper disposal of urban waste? (5) (20)

Q. 5.

(a) What constitutes a **Balanced Diet**? Briefly explain the functions of Carbohydrates and Proteins in the human body. (5)

(b) Define **Food Preservation**. Explain the principles behind **Pasteurization** and **Canning** as methods to control food deterioration.(5)

(c) What is the **Internet of Things (IoT)**? How is it transforming daily life and business? Give two real-world examples.(5)

(d) Differentiate between **RAM** and **ROM**. Explain the basic architecture of a computer focusing on the CPU and its components (ALU and CU). (5) (20)

SECTION-II

Q.6

(a) Two pipes, A and B, can fill a tank in **10 hours** and **15 hours**, respectively. A third pipe, C, can empty the full tank in **30 hours**. If all three pipes are opened simultaneously, in how much time will the tank be full? (5)

(b) The ratio of the salaries of three employees, X, Y, and Z, is **4:5:7**. If Y's salary is increased by **10%**, and Z's salary is decreased by **25%**, the new total of their combined salaries is **Rs. 1,69,500/-**. Find the original salary of employee X. (5)

(c) A contractor completed $\frac{3}{5}$ of a road construction project in **60 days**. If he then hires **10 additional workers**, he finishes the remaining work in **20 days**. How many workers did the contractor originally have? (Assume all workers work at the same rate.) (5)

(d) A class has an average score of **78** on a test. If the top **5** scores (98, 95, 92, 90, 85) are removed, the average score of the remaining students drops to **75**. Calculate the total number of students in the class. (5) (20)

Q. 7.

(a) In a survey of **100 people**, 65 watch Cricket, 40 watch Hockey, and 20 watch neither. How many people watch **both** Cricket and Hockey? (5)

(b) A rectangular swimming pool has a length that is **4 meters more** than its width. If the **perimeter** of the pool is **72 meters**, what is the volume of water needed to fill the pool to a uniform depth of **2.5 meters**? (5)

(c) A train leaves City A at 8:00 AM traveling at **60 km/hr**. Another train leaves City B at the same time, traveling towards City A at **40 km/hr**. If the distance between City A and City B is **400 km**, at what time will the two trains meet? (5)

(d) The sum of the present ages of a father and his son is **75 years**. Ten years ago, the father's age was **four times** the son's age. What are their current ages? (5) **(20)**

Q.8.

(a) In a certain code language, if '**ROAD**' is coded as '**UQDG**', how would '**LAKE**' be coded in the same language? Explain the rule of coding. (5)

(b) A man tells a woman, "The son of my sister's husband is the father of your son." How is the woman related to the man? (5)

(c) Find the next number in each of the following sequences and explain the pattern:

- (i) 4, 12, 6, 18, 9, 27, ____
- (ii) 1, 2, 6, 24, 120, ____ (5)

(d) Five friends (P, Q, R, S, T) have different heights.

- P is shorter than Q but taller than R.
- S is shorter than T but taller than Q.
- The shortest person is 150 cm tall, and the tallest is 180 cm tall. Who among the friends is the third tallest, and what is the maximum possible range of their heights? (5)

(20)

Best Wishes for CSS-2026

Part = II

Section - I

Q. NO. 4

(b)

Acid Rain

"Acid rain is nothing but the contamination of the rainfall" (WMO)

Acid rain refers to the contamination of the humidity caused by Sulfur Dioxide and Nitrogen Oxide NO_2 .

Chemical reactions involved in its formation

Acid rain is the result of several chemicals. Chemicals such as fossil fuel — contributes to the functions of transportation, mills and industries. The

The function of vehicles, cars, industries and agriculture activities produce gases such as CO_2 , NO_2 and SO_2 . These all gases react and form acid rain or acidity of rain.

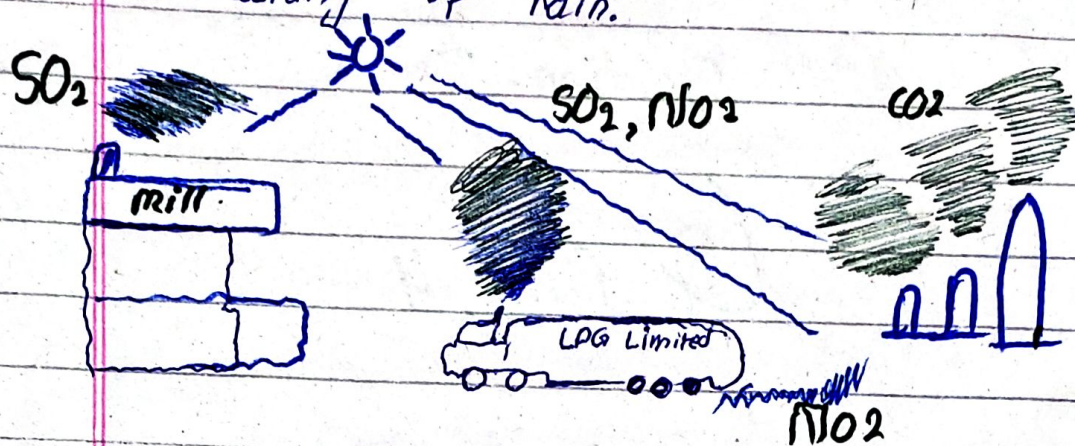


Figure 0.1 Formation of acid rain

Acid rain's effects on life/vegetation

1. Acid rain causes skin related diseases.
2. It causes lungs and irritation problems in humans.
3. Acid rain harms vegetation through contaminating foods, fruits and vegetables.
4. Acid rains persistently removes the paint colours of infrastructure such as homes, governmental building etc.

(c)

Understanding Remote Sensing / GIS

Remote Sensing and GIS are both modern technological applications in Environmental Science. Through installation of sensors on aircrafts, weather balloons and plans assist the professionals to monitor and predict agricultural activities and weather.

Remote Sensing and GIS's role in environmental monitoring and disaster management:

1. Monitoring melting of glacier

Experts through Remote Sensing and GIS analyse, monitor and collect data in the form of videos and pictures about glacier melting and predict its life spans.

2. Construction hydrological projects

Through Remote Sensing and

and GIS engineers select places for dams and canals. Also, by the help of GIS, they maintain the overall construction and functions of dams. This is how Pakistan-India monitors the flow of their shared water.

3. Monitoring of roads and infrastructure developments

Professionals use Remote Sensing and GIS to develop roads and buildings across the globe. This is how China uses Remote Sensing and GIS to develop its BRI projects.

4. Monitoring deforestation

Forest management authorities use remote sensing and GIS to monitor massive deforestation. Through sensors, authorities monitor and protect forests against timber mafias.

5. Predict disasters

meteorologists through remote sensing collect data and analyse the

formation of snow, cyclon and storms. Also, they promote awareness about the global warming.

(d)

Solid waste Management

According to the UNESCO, Solid waste Management refers to the waste of urbanization. It includes garbages, animal wastage, hospitals' and household's re-cycle and non-recycle materials such as bottles, plastic bags, animal bones and rotten food and vegetations. Therefore, the lack of improper disposal of solid waste harms the environment and natural resources.

Environmental hazards associated with improper disposal of urban waste:

1. Contamination of water

Improper disposal of urban

waste near water bodies results in the contamination of water. It makes water unsafe for animals and humans, causing in the spread of water born diseases.

2. Pollutes air

Solid waste management pollutes air through the release of CO_2 .

Sometimes the improper disposal of solid waste catches fire, resulting in the emission of CO_2 which pollutes the air.

3. Enhances soil erosion

Improper urban waste results in soil erosion. It contaminates the surfaces of valuable lands.

4. Promotes lack of sanitation

Improper solid waste management results in dirt and the spread

bottles and garbages often block water ways. Consequently, creates a sense of lack of sanitation across city streets, ~~near~~ roadsides and rural areas.

(a) Rock cycle

Rock cycle is a continuous process that changes the rocks from one type to another. It happens due to erosion, pressure, melt of magma, weather change and heat.

Igneous	Sedimentary	Metamorphic
Hard, crystalline, formed from lava	Layered, may contain fossils, formed by compression of sediments over time, softer than igneous	Formed by heat and pressure on existing rocks, of crystalline texture
Granite / Basalt	Sandstone, Limestone	Marble, slate

Figure 0.2 variation table

Q. NO. 2

(a)

Difference between star and planet

Features	Star	Planet
Def.	A massive, glowing ball of hot gas, producing its own light and heat	A body that orbits the star, does produce its own light
Light	Produces heat and light through nuclear fusion	Does not produce light. It reflects the light of star
Mass	larger	small
Composition	Hydrogen and helium gas	Rocky, gaseous
Examples	Sun	Mars, Earth etc

Figure 0.3 Variation table

The life of a star from Nebula to a black hole:

1. Nebula

A cloud of gas and dust in space; the birth place of stars.

2. Protostar

Gravity pushes Nebula together; temperature rises and Protostar forms.

3. Main sequence Star

Nuclear fusion begins and protostar leads to star

4. Supergiant

Hydrogen runs out and star expands and cools at its surface

5. Death of star

Low-mass star becomes a white Dwarf then slowly cools into blackhole.

(c)

Global warming

According to IPCC, global warming is the persistent warming of the earth. The warming is being caused by the massive emissions of methane, CO_2 , NO_2 and SO_2 .

Mechanism of the greenhouse effect.

1. Solar radiation

The sun light reaches to the earth and warming it.

2. Infrared radiation

The earth emits ~~low~~ heat and gases in the atmosphere.

3. Heating trap

The gases reach to greenhouse and the sun light

also combines the emission where heat trapping and global warming takes place.

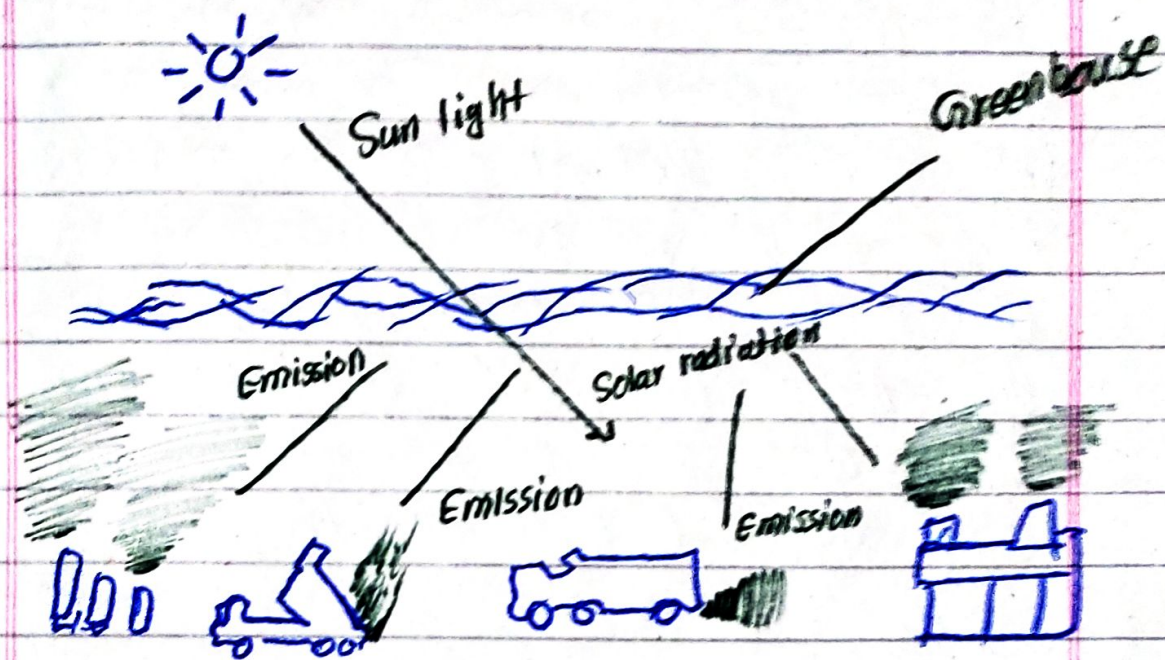


Figure 04. overall mechanism of greenhouse effect

Major greenhouse gases

1. CO_2
2. NO_2
3. methane

(d)

Tsunami

Tsunami is the combination of two Japanese words. Tsu means harbour and nami refers to wave. So, Tsunami is a natural disaster. It contains hundreds of waves which begin from the deep oceans. The size of the wave is about 300 meter high and it runs with the speed of 320 km per hour.

Natural processes that cause tsunami

1. Volcanic bursts deep in Oceans

According to World Meteorological Organization (WMO), there are thousands of inactive volcanoes deep in Oceans. When they become active, cause eruption. The eruption forms tsunami.

2. Earthquakes beneath the ocean

Earthquakes beneath the

Oceans cause tsunami. When the epicenter of earthquake is in ocean & takes place then tsunami becomes unstoppable.

Impacts on coastal areas

1. Destruction of homes

Tsunami destroys thousands of homes across the coastal areas. It also destroys infrastructure such as seaports and roads.

2. Enhances casualties

Tsunami not only kill humans but also it kills animals across the area.

3. Spoils vegetation-habitat

It destroys vegetation - sea food and habitat near the coastal region.

(b)

Semiconductors

Semiconductors are tiny chips. They are materials whose electrical conductivity is between that of conductors and insulators. Examples: Silicon (Si) Germanium (Ge)

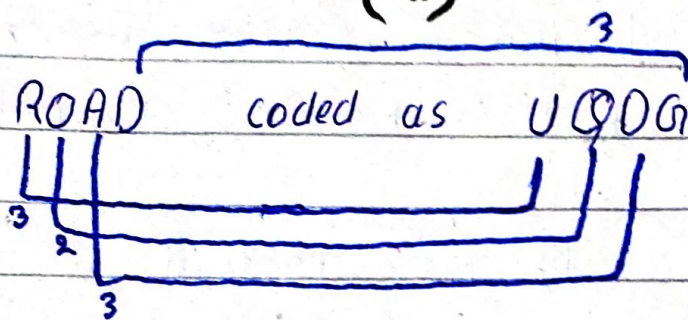
Feature	N-semiconductor	P-type
Doping	Added with elements having extra electrons	Having fewer electrons
Charge carrier	Electrons (Negative) are majority carriers	Holes (Positive)
Conductivity	mainly due to free electrons	mainly due to holes
Example	Silicon doped with Phosphorus	with Boron

major applications

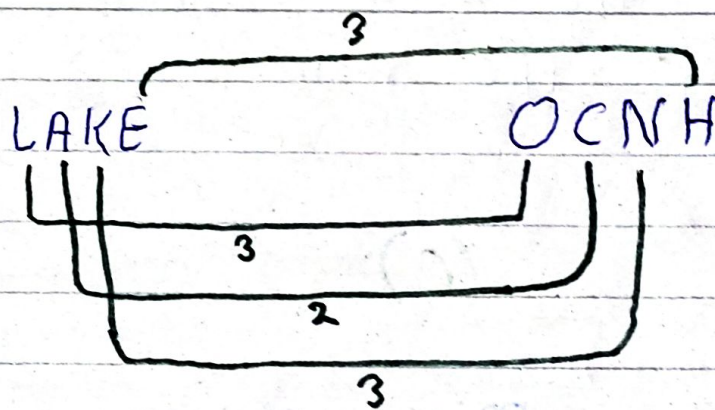
1. Solar cells
2. Diodes and transistors

Section-II

Q. NO. 8
(a)



So, Lake is coded



Lake can be coded as OCNH. Because in original code ROAD coded as UCQDGN where the first Alphabet of Road 3 steps forward to form U then two step to form Q later persistently 3 steps forwarded generated code for Road as UCQDGN. So, the same process ~~was~~ is being followed for LAKE. Thus, LAKE can be coded as OCNH.

(b)

Blood relations

man

woman

Sister's husband is brother-in-law

Son of sister's husband is Nephew

Nephew's wife is to that man's
Sister-in-law

So, the woman is sister-in-law
of the man

(c)

Missing numbers

(i)

$$\begin{array}{ccccccc} & 8 & 6 & 12 & 9 & 18 & \\ & \swarrow & \searrow & \swarrow & \searrow & \swarrow & \searrow \\ 4 & 12 & 6 & 18 & 9 & 27 & 18 \\ & \swarrow & \searrow & \swarrow & \searrow & \swarrow & \searrow \\ & 3 & 3 & 3 & 3 & 3 & \end{array}$$

(ii)

$$1, 2, 6, 24, 120, \underline{240}$$

(d)

P shorter than Q



Taller than R

S is shorter than T



Taller than Q

T is taller ①

SQ is taller ②

T is taller ③

180

150

T is the third tallest
friend with cm 170