

NOA Mock-8 for C88-2024

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Increase length of theory portion

Add headings

Draw diagrams

Improve paper presentation

V good for math portion

PART-II SECTION-I

Question no. 5:
Answer: Difference between ^(a) RAM and ROM:

Random Access Memory (RAM)

* RAM is a volatile memory that stores data as long as power is supplied.

* Read and Write operations are supported.

* It is used to store data that is processed by CPU temporarily.

* It is high speed memory.

* CPU can easily access data stored in RAM.

* Larger in size and capacity than ROM.

* It is used as CPU cache/primary memory.

* Data stored is easily accessible.

* RAM costs more than ROM.

* A RAM chip can store only a few GB of data.

* It is used for the temporary storage of data currently being processed by the CPU.

Read Only Memory (ROM)

* ROM is non-volatile memory that stores data even when power is turned off.

* Only read operations are supported.

* It is used to store firmware or microcode to control hardware components.

* It is much slower than RAM.

* CPU cannot easily access data stored in ROM.

* Smaller in size and capacity than RAM.

* It is used as firmware, micro-controller.

* Data stored is not easily accessible.

* ROM is cheaper than RAM.

* ROM chip can store multiple MBs of data.

* It is used to store firmware, BIOS and other data that needs to be retained.

Nibble:

Definition: Nibble may be defined as the second smallest unit of information for data transmission and storage.

USB:

Definition: USB may be defined as a hardware interface that can attach up to 127 peripheral devices to a computer, including keyboards, mice, printers, flash drives, external devices, and joysticks.

(b)
Answer: How AI has revolutionized the world: Artificial Intelligence (AI) has revolutionized the world.

Places of Use:

1. Use in Factories: AI is being used in robots/robotics in factories. The use of AI in factories instead of humans minimizes loss percentage and maximizes profits.
2. Use in Planning: AI is also being widely used in planning infrastructure of metropolitan cities. This reduces errors and mistakes which are made by humans.
3. Use in Vehicles: AI is also being widely used in automobiles/vehicles, i.e. in self-driving vehicles. This reduces risks of accidents and loss of life.
4. Use in Satellites: AI is also being used in satellites. This makes the operations of satellites much more efficient.
5. Use in Military Exercises: AI is also being used in military exercises, particularly in training. This helps in keeping military fit and ready for battle.

Answer: Optical Fiber: (c)

Definition: Optical Fiber may be defined as a technology that uses glass or plastic threads to transmit data as light pulses along a hollow glass/plastic tube (fiber).

Working of Optical Fiber:

Light travels down a fiber optic cable by bouncing off the walls of the cable repeatedly (Figure A). Each light particle (photon) bounces down the pipe with continued internal mirror-like reflection.

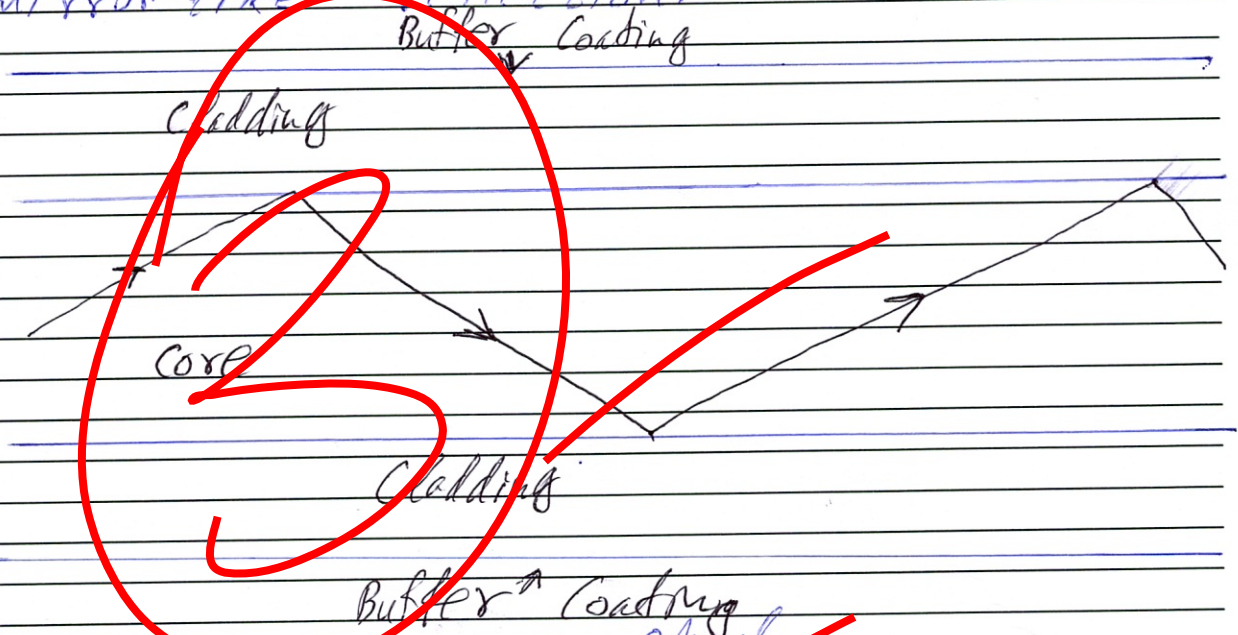


Figure A: Working of ^{optical} fiber

Advantages of Optical Fiber:

- (i) Cheap: Long continuous miles of optical fiber cable can be made cheaper than equivalent lengths of copper wire.
- (ii) Thinner and light-weighted: Optical fiber is thinner, and can be drawn to smaller diameters than copper wire.
- (iii) Less signal degradation: Loss of signal in optical fiber is less than in copper wire.
- (iv) Long life span: Optical fibers usually have a longer life cycle of over 100 years.

Answer: Critical speed of satellite;
Definition: Critical speed may be defined as the minimum velocity required to put the motion of satellites in a stable circular orbit around any celestial object.

Critical speed of satellite around Earth: The critical speed of satellite around Earth is 7.9 km/sec .

Difference between Geostationary and Polar Satellites:

Geo-Stationary Satellite

* Geo-Stationary satellite remains stationary with respect to Earth, that is it moves with respect to Earth.

* Distance of geostationary satellite is approximately $22,300$ miles or $35,800 \text{ km}$ from Earth.

* These are used for:

- i. Telecommunication,
- ii. Broadcasting,
- iii. Weather forecasting,
- iv. Remote sensing,
- v. Navigation through GPS.

Polar Satellite

* Polar satellites are satellites which pass above or nearly above both poles of the celestial body.

* Distance of polar satellite is approximately 500 to 800 km from Earth.

* These are used for:

- i. Land mapping
- ii. Disaster Management,
- iii. Predicting weather in short time.

Question no. 4:

Answer: Earthquake: (a)

Definition: Earthquake may be defined as the shaking of surface of Earth resulting from the sudden release of energy in the lithosphere that creates seismic waves.

Generation of Earthquakes:

The tectonic plates are always slowly moving, but they get stuck at their edges due to friction (Figure B).

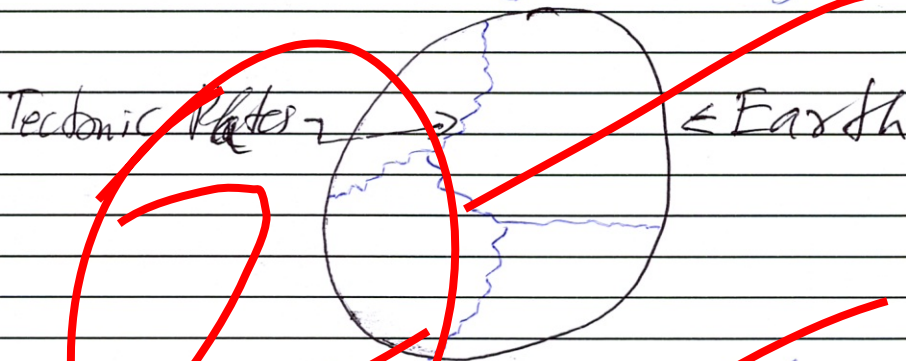


Figure B: Tectonic plates in Earth's crust. When the stress on the edge overcomes friction, an earthquake occurs.

Relation of Earthquake with Tsunami: If an earthquake disturbs the seafloor by shaking it up and down, then the earthquake energy can contribute to huge waves at nearby coastlines called a tsunami (Figure C).

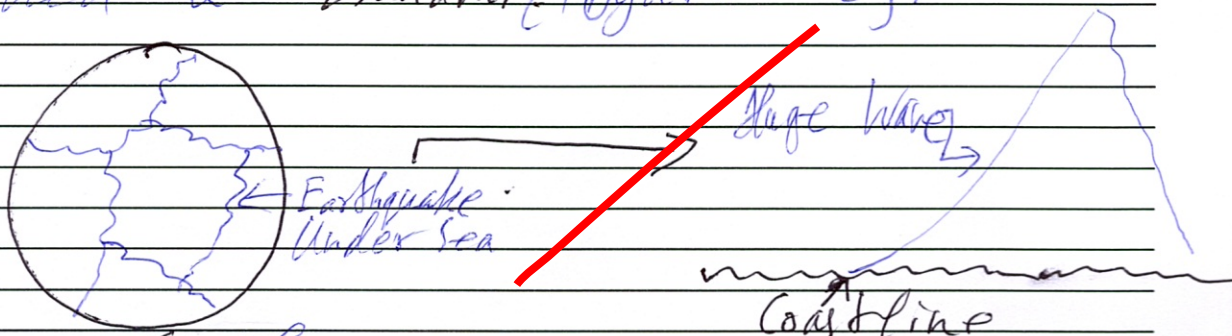


Figure C: Tsunami

(b)
Answer: Coriolis Force:

Definition: Coriolis force may be defined as an apparent force caused by Earth's rotation.

What is Coriolis Force responsible for? The Coriolis force is responsible for deflecting force towards right in Northern hemisphere and towards left in southern hemisphere.

Hurricane:

Definition: Hurricane may be defined as a rapidly rotating storm system characterized by a low-pressure center, a closed low-level atmospheric circulation, strong winds, and a spiral arrangement of thunderstorms that produce heavy rains and squalls.

Generation of Hurricane:

Season: Hurricanes tend to develop during summer, but have been noted in nearly every month in most tropical cyclone basins.

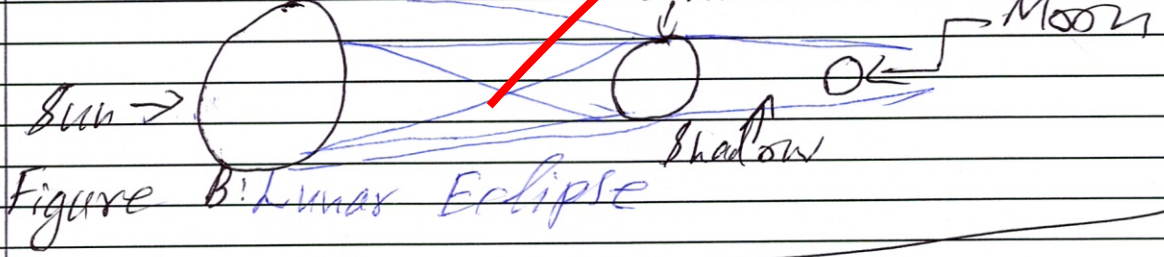
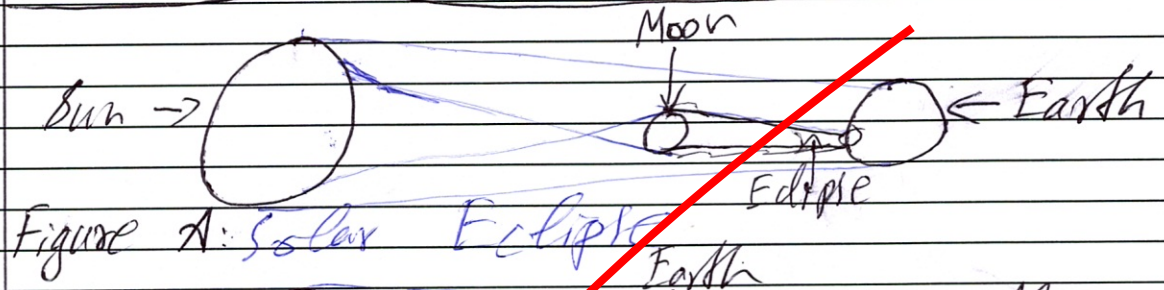
Initiation of Hurricane:

Hurricanes, on either side of the equator generally have their origins in the Intertropical Convergence Zone, where winds blow from either the northeast or southeast.

Heated Air: Within the intertropical convergence zone, air is heated over the warm tropical ocean and rises in discrete parcels, which causes thunder showers to form. These showers dissipate quite quickly, which creates a flow of warm, moist, rapidly rising air, which starts to rotate cyclonically into hurricane.

Answer: Difference (C) between Solar and Lunar Eclipse:

| Solar Eclipse | Lunar Eclipse |
|--|--|
| Solar eclipse may be defined as the phenomenon in which the moon comes in between the sun and the Earth. | Lunar Eclipse may be defined as the phenomenon in which the Earth comes in between the Moon and the Sun. |
| There may be partial or total solar eclipse. | There may be partial or total lunar eclipse. |
| During total solar eclipse, moon completely blocks sun. | During total lunar eclipse, Earth completely comes between moon & sun. |
| During partial solar eclipse, moon partially blocks sun. | During partial lunar eclipse, Earth partially comes between moon and sun. |



Answer: Doping in semi-conductor:
 Definition: Doping in semi-conductor may be defined as the process of adding an impurity to any semi-conductor (e.g. Silicon, Germanium) is called doping in/of semi-conductor.

Name of Impurity: The impurity which is added is known as dopant.

Result of Doping: When an impurity is added to semi-conductor without modifying the crystal structure, an N-Type material is produced (figure).

Example: Some atoms have 5 electrons in their valence bonds like As and Sb. Doping of silicon with either impurity must not crystal structure or the bonding process. The extra electron of impurity atom does not take part in covalent bonding. These electrons are loosely held by their originator atoms.

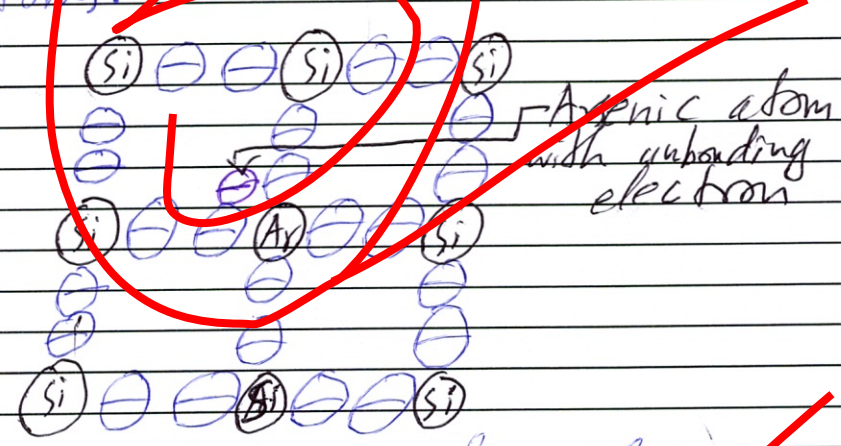


Figure: Doping of silicon

Types of Ceramics: Different types of ceramics are given below:

a. Pottery Ceramics:

(i) Earthenware: The ceramics which are made by using fire to heat soil are known as earthenware ceramics.

Example: These include:

- (i) Pots,
- (ii) Vases,
- (iii) Earthenware dishes.

(ii) Stoneware: The ceramics which contain stone and are made by using fire are known as stoneware ceramics.

Example: These include

- (i) Decorations
- (ii) Vases,
- (iii) Stoneware dishes.

(b) Advanced ceramics:

(i) Bone china: The ceramics which are made by adding powdered bone ash is known as bone china.

Examples: These include:

- (i) Cappuccino sets,
- (ii) Tea sets,
- (iii) Dinner sets.

(ii) Glass ceramics: As the name indicates, the ceramics which are made by moulding glass are known as glass ceramics.

Examples: These include:

- (i) Windows,
- (ii) Pool enclosure,
- (iii) Kitchenware.

SECTION-II

Question no. 6:

(a)

Solution:

Given

Son's Age = 30 years

To Find

Father's Age = x

We know that

5 years Father's Age = x + 5

Son's Age = 30 - 5 = 25

Also,

Father's Age was = $\frac{3}{5}(x - 5)$
= $\frac{3}{5}(25)$

Now

$x - 5 = 75$

Adding 5 on both sides, we get

$x - 5 + 5 = 75 + 5$

$x = 80$ years Ans

(6)

Solution:

Given
Mean of 10, 30, y , 50 = 50

To Find

We know that $y = ?$

By putting the values, $\text{mean} = \frac{\text{sum of all observations}}{\text{total number of observations}}$
we get

$$50 = \frac{10 + 30 + y + 50}{4}$$

$$50 = \frac{90 + y}{4}$$

$$50 = \frac{90 + y}{4}$$

Multiply by 4 on both sides, we get

$$4 \times 50 = \frac{90 + y}{4} \times 4$$

$$200 = 90 + y$$

Subtract by 90 on both sides, we get

$$90 - 200 = 90 + y - 90$$

\Rightarrow

$$y = 110$$

Ans

(7)
(i)

Solution:

Given

Set = 2, 6, 18, 54, ?

To find

Missing term = ?

We know that

Rule = (1st number $\times 3$ = 2nd number)

(2nd number $\times 3$ = 3rd number)

\Rightarrow (2) (2 $\times 3 = 6$) (6 $\times 3 = 18$) (18 $\times 3 = 54$)

(54 $\times 3 = 162$)

So missing term is

2, 6, 18, 54, 162 Ans

(ii)

Solution!

Given

To Find $Set = 3/25, 25/?, 4, 1$
Missing Term = ?

In the given series, numbers are arranged following the rule,

There fore the missing number is 27

Series = $3/25, 25/27, 4, 1$ Ans

(d)

Solution:

Given

Product of 2 numbers = 320
Ratio of 2 numbers = 1:5
To Find Difference between squares = ?

Let the numbers be x & $5x$ respectively.
According to question,

$$(x) \times (5x) = 320$$

Divide by 5 on both sides, we get

$$5x^2 = 320$$

$$x^2 = \frac{320}{5}$$

$$x = 8$$

$$\text{Difference between squares} = (5 \times 8)^2 - (8)^2$$

$$= (40)^2 - (8)^2$$

$$= 1600 - 64$$

$$= 1536$$
 Ans

Question no. 7:

(a)

Solution:

Given Data

Selling price of both scooters = 96000 each

Profit made of first scooter = 20%

Loss made on second scooter = 20%

To Find

Gain/Loss percentage in total = ?

We know that
on first scooter

$$CP = \left[\frac{100}{100 + \text{Profit}\%} \right] \times SP$$

Putting values, we get

$$CP = \left[\frac{100}{100 + 20} \right] \times 96000$$

$$= \left[\frac{100}{120} \right] \times 96000$$

$$= (0.8333) \times (96000)$$

$$= 80,000 \quad (i)$$

On second scooter

$$CP = \left[\frac{100}{100 - \text{Loss}\%} \right] \times SP$$

By putting values, we get

$$CP = \left[\frac{100}{100 - 20} \right] \times 96000$$

$$= \left[\frac{100}{80} \right] \times 96000$$

$$= (1.25) \times (96000)$$

$$= 120,000 \quad (ii)$$

$$\text{Total Cost Price} = 80,000 + 120,000$$

$$= 200,000$$

$$\text{Total selling price} = 96000 + 96000 \\ = 192,000$$

$$\Rightarrow \text{Loss} = 200,000 - 192,000 \\ = 8000$$

Now,

We know that

$$\text{Percentage} = \frac{\text{Obtained Value}}{\text{Total Value}} \times 100$$

By putting the values, we get

$$= \frac{8000}{200,000} \times 100$$

$$= \frac{8}{200} \times 100$$

$$= 0.04 \times 100$$

$$= 4\% \quad \text{Ans}$$

Hence, the woman suffered a total loss of 4% on selling the scooters.

Answer:

(*) (d)

Solution:
Given Data

(c)

$$A = \{a, e, i, o, u\}$$

$$U = \{a, b, c, \dots, z\}$$

To Find

$$A' = ?$$

We know that

$$A' = U - A$$

Putting values, we get

$$A' = \{a, b, c, \dots, z\} - \{a, e, i, o, u\}$$

$$= \{b, c, d, f, g, h, j, k, l, m, n, p, q, r, s, \\ t, v, w, x, y, z\} \text{ Ans}$$