NTA UGC NET & SET

GENERAL PAPER ON TEACHING & RESEARCH APTITUDE

PART - IV

Professor Academy

Most of the September 2020 NET Exam Questions are asked from this Book

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PART - IV

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99.12
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Thenmozhi.G
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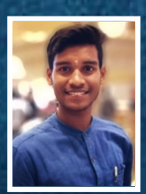
JRF



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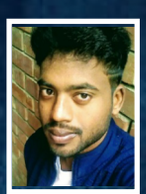

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Pavithra.R
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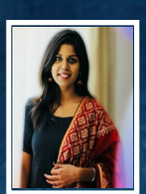

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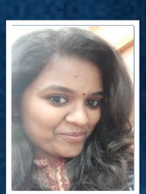

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CONTENT

UGC NET Exam:

UGC NET is a national level computer based exam conducted by NTA on behalf of University Grants Commission to certify the eligibility of candidates for the post of 'Assistant Professor' and/or 'Junior Research Fellowship.

Paper	Marks	Numebr of Questions	Pattern	Duration
Paper - I General Paper on Teaching & Research Aptitude Code No. : 00	100	50	The questions will be generic in nature, intending to assess the teaching/research aptitude of the candidate. It will primarily be designed to test reasoning ability, comprehension, divergent thinking and general awareness of the candidate.	03 hours (180 minutes) without any break. All the questions are compulsory.
Paper - II	200	100	This is based on the subject selected by the candidate and will assess domain knowledge.	

* There will be no negative marking in the exam

PAPER-I

Unit-I Teaching Aptitude

- Teaching: Concept, Objectives, Levels of teaching (Memory, Understanding and Reflective), Characteristics and basic requirements.
- Learner's characteristics: Characteristics of adolescent and adult learners (Academic, Social, Emotional and Cognitive), Individual differences.
- Factors affecting teaching related to: Teacher, Learner, Support material, Instructional facilities, Learning environment and Institution.
- Methods of teaching in Institutions of higher learning: Teacher centred vs. Learner centred methods; Off-line vs. On-line methods (Swayam, Swayamprabha, MOOCs etc.).
- Teaching Support System: Traditional, Modern and ICT based.
- Evaluation Systems: Elements and Types of evaluation, Evaluation in Choice Based Credit System in Higher education, Computer based testing, Innovations in evaluation systems.

Unit-II Research Aptitude

- Research: Meaning, Types, and Characteristics, Positivism and Postpositivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-III Comprehension

- A passage of text be given. Questions be asked from the passage to be answered.

Unit-IV Communication

- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-V Mathematical Reasoning and Aptitude

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.

- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.).

Unit-VI Logical Reasoning

- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.
- Indian Logic: Means of knowledge.
- Pramanas: Pratyaksha (Perception), Anumana (Inference), Upamana (Comparison), Shabda (Verbal testimony), Arthapatti (Implication) and Anupalabddhi (Non-apprehension).
- Structure and kinds of Anumana (inference), Vyapti (invariable relation), Hetvabhasas (fallacies of inference).

Unit-VII Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-VIII Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

Unit-IX People, Development and Environment

- Development and environment: Millennium development and Sustainable development goals.
- Human and environment interaction: Anthropogenic activities and their impacts on environment.
- Environmental issues: Local, Regional and Global; Air pollution, Water pollution, Soil pollution, Noise pollution, Waste (solid, liquid, biomedical, hazardous, electronic), Climate change and its Socio-Economic and Political dimensions.
- Impacts of pollutants on human health.
- Natural and energy resources: Solar, Wind, Soil, Hydro, Geothermal, Biomass, Nuclear and Forests.
- Natural hazards and disasters: Mitigation strategies.
- Environmental Protection Act (1986), National Action Plan on Climate Change, International agreements/efforts -Montreal Protocol, Rio Summit, Convention on Biodiversity, Kyoto Protocol, Paris Agreement, International Solar Alliance.

Unit-X Higher Education System

- Institutions of higher learning and education in ancient India.
- Evolution of higher learning and research in Post Independence India.
- Oriental, Conventional and Non-conventional learning programmes in India.
- Professional, Technical and Skill Based education.
- Value education and environmental education.
- Policies, Governance, and Administration

1 PEOPLE, DEVELOPMENT & ENVIRONMENT

The importance of environment education is to give awareness to help society and individuals to acquire awareness and sensitivity towards environment. Education system play a huge role in saving environment by imparting knowledge on how to protect the environment to people in diverse communities. Being an Assistant professor, you can reach out to more people in spreading the awareness about environment and its importance and so the qualifying exam for the same demands the conceptual knowledge on recent trends of Energy resources, impacts of pollution, mitigation strategy of disaster.

Approach Strategy

This material is crafted with perfect analysis of previous year questions and syllabus in a such a way to help you answer all the five questions assigned from this unit.

The questions may be of both static and dynamic format, in which you need to understand the core concept of the subject and then pick up a correct option by eliminating the incorrect options. Candidate should pay more attention while answering not based question, Assertion & Reasoning question. Candidates should also be aware regarding recent environmental issue to score completely in this unit.

Scoring in this Environment unit is made easy with this study material. We guide you to be successful with this Blueprint to understand Professor Academy's Environment Material.

- Pollution
- Waste Management
- Energy Resources
- Natural Hazards And Disasters
- International Conventions

POLLUTION

- Pollution is the effect of undesirable changes in our surroundings that have harmful effects on plants, animals and human beings.
- Pollution is an addition of any substance (like solid, liquid, or gas) or any form of energy (such as heat, sound, or radioactivity) to the environment that cause the negative effect to the environment.
- Pollution is defined as the excess discharge of any substance into the environment which affects adversity quality of environment and causing damage to humans, plants and animals.

Pollutant

A substance, which causes pollution, is known as pollutant. The pollutants that can be rapidly decomposed by natural processes (degradable or non- persistent pollutants). Some pollutants remain in environment for longer time because they decompose very slowly by the natural processes. Some pollutants cannot be decomposed by natural processes (non-degradable pollutants). Pollutant can be in the form of solid, liquid or gaseous substance.

Causes of Pollution

Pollution can occur by either Anthropogenic (human-made) activities e.g., construction, transportation and manufacturing or naturally e.g., Volcanic eruptions, release of CH_4(Methane) by paddy fields and cattle, emission of natural gas, O_3(Ozone) , nitrogen oxides, cosmic rays, UV-rays etc. Pollution causes damage to human, plant and animal life. The nature and concentration of pollutant determine the severity of effect of pollution.

Types of pollution

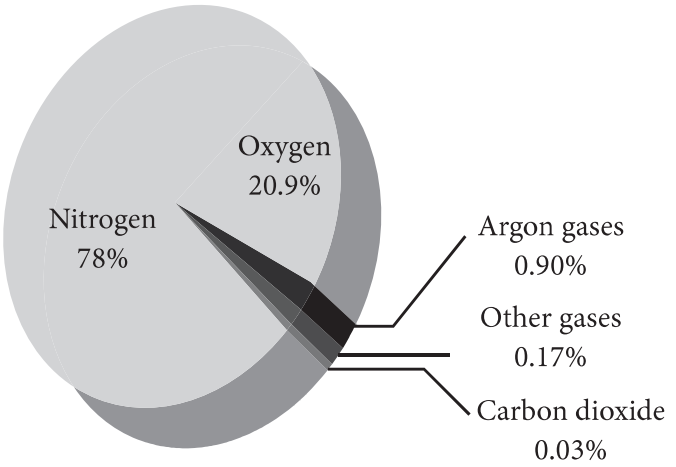
- Air pollution
- Noise pollution
- Water pollution
- Soil pollution
- Thermal pollution
- Radiation pollution

In order to control environmental pollution, the Government of India has passed the Air Act 1981, Water act 1974, Environment (Protection) Act, 1986 to protect and improve the quality of our environment (air, water and soil).

AIR POLLUTION

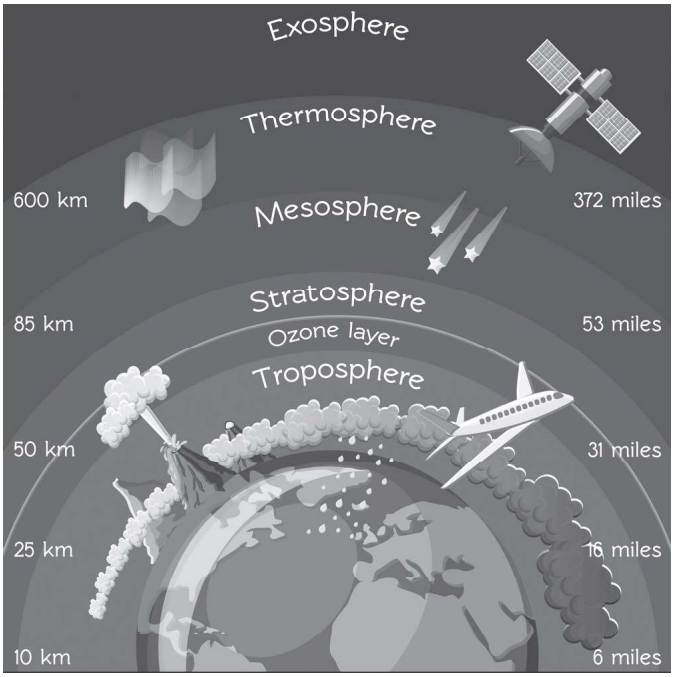
Air pollution may be defined as the presence of any solid, liquid or gaseous particles in the atmosphere in such concentration that may be directly and/or indirectly injurious to humans or other living organisms. (It is defined as the addition of undesirable substance in the air.)

Composition of Air



By volume, dry air contains 78 % Nitrogen, 20.90% Oxygen, 0.90% Argon, 0.03% Carbon dioxide, and small amounts of other gases. Air also contains a variable amount of water vapour, on average around 1% at sea level, and 0.4% over the entire atmosphere.

Layers of Atmosphere



The atmosphere is comprised of layers based on temperature. These layers are the troposphere, stratosphere, mesosphere and thermosphere. A further region at about 500 km above the Earth's surface is called the exosphere.

Sources of Air Pollution

Air pollutants are emitted from a range of both **man-made** and **natural sources** including:

Natural Causes - Volcanic eruptions and forest fire biological decay, and emissions of volatile organic compounds from plants.

Manmade causes

- Burning of fossil fuels in electricity generation, transport, industry and households
- Industrial processes and solvent use, for example in the chemical and mining industries
- Agriculture
- Waste treatment

How does Air Get Polluted?

The substances which contaminate the air are called **air pollutants**, it may be in the form of gas, smoke, dust, fume, mist, or chemical particulates in the atmosphere. It interferes with the normal environmental processes.

Classification of Air Pollutants:

Air pollutants can broadly classified into two types as follows based on their **source of Formation.**

Primary pollutants

1. Primary Pollutants – Pollutants that are **emitted directly into the environment** from either natural events or from human activities. The natural events are dust storms, volcano etc. and human activities such as industrial emission, transportation etc. can be emission from vehicles, industrial wastes. About 90% of global air pollution is constituted by five primary pollution.

They are

i. Carbon oxides (CO_x - CO, CO_2)
ii. Nitrogen oxides (NO_x - NO, NO_2, NO_3)
iii. Sulphur oxides (SO_x - SO, SO_2, SO_3)
iv. Hydrocarbon
v. Particulate matter (PM-$PM_{2.5}$,PM_{10}) Etc.

Secondary pollutants

2. Secondary pollutants – Pollutants that are emitted indirectly into the environment by reaction among the primary pollutants. Primary pollutants when reaction with each other or from basic components of air; forms a new pollutants called secondary pollutant.

Example

i. sulphuric acid (sulphurdioxide reacts with water vapour in the atmosphere and forms secondary air pollutant sulphuric acid)
ii. nitric acid
iii. ozone
iv. PAN (Peroxy Acetyl Nitrate- The peroxyacyl nitrates are formed when ozone reacts with hydrocarbons such as those found in unburned petroleum. They are commonly found in photochemical smog)

Air pollutants can broadly classified into two types as follows based on their **Nature of Presence**

Tropospheric air pollution occurs due to the presence of undesirable solid or gaseous particles in the air. The following are

Gaseous pollutant	Particulate pollutant
These are oxides of sulphur, nitrogen and carbon, hydrogen sulphide, hydrocarbons, ozone, oxidants Benzene, Ethylene, Asbestos, Radon	These Dust, mist, fumes,smoke, smog,Metallic Oxides Nanoparticles etc.

Air pollutants can broadly classified into two types as follows based on their **amount of existence in nature**

The **criteria pollutants** are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter10, particulate matter2.5, sulphur dioxide and Ammonia. Criteria pollutants are the only air pollutants with national air quality standards that define allowable concentrations of these substances in ambient air.

- **Non-criteria pollutants** are the entire range of contaminants other than the criteria pollutants, which includes other toxic and hazardous pollutants

Gaseous Pollutants

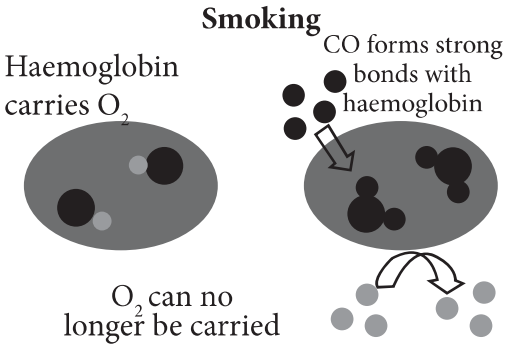
1. **Carbon monoxide (CO)**

- **Features** -Carbon monoxide (CO) is one of the most serious air pollutants. It is a colourless and odourless gas that is slightly less dense than air. Carbon monoxide is a primary pollutant and also a non-persistent in nature (occurs only for few months in atmosphere).
- **Sources** - It is produced as a result of **incomplete combustion** (Not burnt completely) of carbon. Vehicular exhausts are the single largest source of carbon monoxide. Other sources, which produce CO, involve

incomplete combustion of coal, firewood, petrol, Diesel etc.

- **Health Effects**- Carbon monoxide poisoning is the most common type of fatal air poisoning.Red blood cells contain a protein called hemoglobin that actually carries the oxygen and delivers oxygen throughout the body. Haemoglobin reacts with oxygen and forms **oxyhaemoglobin**.

When we inhale the Carbon monoxide from the polluted atmosphere it readily combines with hemoglobin (since the carbon monoxide has 300 times **greater affinity** (than oxygen) to react with hemoglobin) and produces **carboxyhaemoglobin**, which reduces the oxygen carrying capacity of the blood. It is toxic to animals (including humans) when encountered in concentrations above about 35 ppm (parts per million).



In blood, when the concentration of carboxy haemoglobin reaches about 3–4 per cent, the oxygen carrying capacity of blood is greatly reduced. This oxygen deficiency, results into headache, weak eyesight, nervousness and cardiovascular disorder. This is the reason why people are advised not to smoke. In pregnant women who have the habit of smoking the increased CO level in blood may induce premature birth, spontaneous abortions and deformed babies.

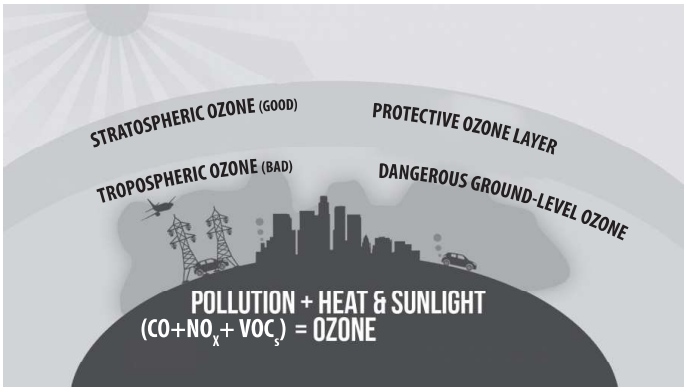
- **Environmental Effects** - Carbon monoxide reacts with other pollutants in the air to form potentially harmful ground level ozone. **It is not a green House Gas.**

2. **Carbon dioxide (CO_2)**

- **Features**- CO_2 is the fourth most abundant gas in the earth's atmosphere. **Naturally CO_2 is not a pollutant** (because it is released into the atmosphere by exhalation- a natural process of respiring by every individual). It is considered as a pollutant when the concentration of CO_2 moves beyond the levels of permissible limit by manmade activities. It does not have any color or odor.
- **Sources** - Carbon dioxide (CO_2) is released into the atmosphere by exhalation respiration, burning of fossil fuels for energy, and by decomposition of limestone during the manufacture of cement, volcanic activity.
- **Health Effects** - Exposure to CO_2 can produce a headaches, dizziness, restlessness, difficulty breathing, sweating, tiredness, increased heart rate, asphyxia. Breathing becomes more difficult as carbon dioxide levels rise.
- **Environmental Effects** - Carbon dioxide is the **long-lived green house gas** that is the dominant contributor to climate change worldwide.

3. **Ozone (O_3)**

- **Features** - Ozone is a gas composed of three atoms of oxygen (O_3). Ozone occurs both in the Earth's upper atmosphere (Stratosphere) and at ground level (Troposphere) Ozone can be good or bad, depending on where it is found. Stratospheric Ozone (good) forms a **protective layer** that shields us from the sun's harmful ultraviolet rays.
- **Sources** - Tropospheric, or ground level ozone (bad), is not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen (NOx) and volatile organic compounds (VOC), carbon monoxide (CO) in the atmosphere in the presence of sunlight. Hence it is a **Secondary Pollutant and a Photochemical Pollutant (formed in the Presence of Sunlight)**.



- **Health Effects** - Breathing ozone can trigger a variety of health problems including chest pain, coughing, and throat irritation, and airway inflammation, itchy eyes. It also can reduce lung function and harm lung tissue.
- **Environmental Effect –** It is a **greenhouse gas.** It causes global warming.

4. **Chlorofluorocarbons (CFCs)**

- **Features** - Chlorofluorocarbons are **machinery and non-vehicular pollutants**. Which contain the elements chlorine, fluorine (halogens) and carbon. CFCs damage the ozone layer of the atmosphere because the chlorine present in the CFC has the potential to destroy large amounts of ozone in the atmosphere.
- **Sources** - Chlorofluorocarbons (CFCs) which are used in refrigerators, air conditioners and aerosol sprays.
- **Environmental Effects –** It is a **greenhouse gas** and one of contributor to climate change worldwide.

5. **Sulphur dioxide (SO2)**

- **Features** - Sulphur dioxide (SO2), a colorless, pungent smelling, toxic gas.
- **Source** - **SO2** in the atmosphere is from burning of fossil fuels, power plants, industrial chimney exhaust, extracting metal from ore, sulphuric acid manufacturing and also from natural sources such as volcanoes.
- **Health Effects** - Short-term exposures to SO2 can harm the human respiratory system and make breathing difficult. People with asthma, particularly children, are sensitive to these effects of SO_2.
- **Environmental effects** - Sulphur dioxide's contribution to **acid rain** can cause direct harm to trees and plants by damaging exposed tissues and, subsequently, decreasing plant growth. Other sensitive ecosystems and waterways are also impacted by acid rain.
- The presence of pollutant SO_2 leads to dis coloration Taj Mahal **(marble cancer)**
- Bio monitoring or biological monitoring is "the systematic use of the organisms or their responses to determine the conditions or changes in the environment". **Plants like white pine, moss and lichens suitable for bio monitoring of Sulphur Dioxide pollution.**

6. **Nitrogen oxide (NOx)**

- **Features** - **NOx** is general name for various combination of oxygen and nitrogen eg.NO_2, NO, N_2O. Nitrogen Dioxide (NO_2) is one of a group of highly reactive gases known as oxides of nitrogen or nitrogen oxides (NO_x). Other nitrogen oxides include nitrous acid and nitric acid.. NO and NO_2 which contribute to global cooling should not be confused with nitrous oxide (Nitrous oxide, N_2O – GHG), which is a Green House Gas and has many uses as an oxidizer.
- **Sources** - Naturally they are also produced naturally by lightning. NO_2 in the air are emissions from cars, trucks and buses, power plants, and off-road equipment, making nitric acid,kerosene heaters, unvented gas stoves, welding,wood stoves.
- **Health Effects** - Breathing nitrogen oxides can cause Irritation of the respiratory system, eyes, and skin, Aggravation of respiratory diseases, particularly asthma, Coughing choking, Nausea, Headache, Abdominal pain, Difficulty breathing.

- **Environmental Effects - Nitrogen dioxide** and **nitric oxide** are referred to together as oxides of **nitrogen (NO_x)**. NO_x gases react to form smog and acid rains as well as being central to the formation of fine particles (PM) and ground level ozone, both of which are associated with adverse health effect. When NOx and volatile organic compounds (VOC_s) react in the presence of sunlight, they form **photochemical smog.**
- Mono-nitrogen oxides eventually form nitric acid when dissolved in atmospheric moisture, forming a component of acid rain. **NO and NO_2 emissions cause global cooling through the formation of -OH radicals that destroy methane molecules, countering the effect of greenhouse gases.**

7. **Peroxyacetyl Nitrate**

- **Features - Peroxyacetyl nitrates also known as Acyl peroxy nitrates, APN. Peroxyacyl nitrates or PANs** are a component of photochemical smog. They are a secondary pollutant since they form in the atmosphere after the emission of primary pollutants.
- **Source** - They are produced in the atmosphere when oxidized volatile organic compounds combine with nitrogen oxide. They are nitrates formed due to reaction between organic peroxy radicals and a variety of volatile organic compounds (VOC_s), in the presence of NO_2. For example, Peroxyacetyl nitrate, ($CH_3COOONO_2$)

- Hydrocarbons + O_2 + NO_2 + light → PAN

- **Health effects –** PAN are powerful respiratory and eye irritants (lachrymators), present in photochemical smog. PAN, bacterial mutagen causes a reduction in genetic transforming activity, melting temperature and viscosity of the DNA. PAN also reduces the infectivity of bacteriophage.
- **Environmental Effect** - Peroxyacetyl nitrate (PAN) is a phytotoxic air pollutantthe most serious biological effects of PANs are of a phytotoxic nature resulting in injury to plants and vegetation.

8. **Volatile Organic compounds (VOC)**

- **Nature - Volatile organic compounds (VOC_s)** are emitted as gases from certain solids or liquids. Volatile Compounds (VOC_s) are a large group of carbon-based chemicals that **easily evaporate** at room temperature.
- **Example** - Formaldehyde, which evaporates from paint, has a boiling point of only –19 °C, The main indoor sources are perfumes, hair sprays, furniture polish, glues, air fresheners, moth repellents, wood preservatives, and other products.
- **Features** - Volatile Organic Compounds, a Primary pollutants (VOC_s) can either have methane (CH_4) group in it or it can be non-methane ($NMVOC_s$). Methane is a GHG which contributes to Global Warming. The $NMVOC_s$ include the aromatic compounds such as Benzene, Toluene, and Xylene which are proved carcinogens.
- **Health Effects** - VOC_s include a variety of chemicals, some of which may have short- and long-term adverse health effects.Health effects: irritation of the eye, nose and throat, headaches, nausea and loss of coordination. Long term health effects: suspected to damage the liver and other parts of the body.

- **How VOC Act as an indoor Air pollutant?** -Organic chemicals are widely used as ingredients in household products. Paints, varnishes and wax all contain organic solvents, as do many cleaning, disinfecting, cosmetic, and degreasing hobby products. Fuels are made up of organic chemicals. All of these products can release organic compounds while we are using them, and, to some degree, when they are stored.

i. **Particulate Control**

Specific machinery is used to remove particulate matter from flue gases. Much of this separation uses physical means of separation and not chemical separation techniques simply because particulate matter is large enough to be "caught". Electrostatic Precipitators and Cyclone Precipitators are used to clean Particulate matter in air.

- Electrostatic precipitators remove particulates by charging particles with an electrical field and then capturing them on collection plates.
- A cyclone separator is a separation device that uses the principle of inertia to remove particulate matter from flue gases.

ii. **Gas Control**

More intense chemical methods of separation are generally required to separate polluting gases from the flue gas. The extraction is important as many acidic gases in flue gas contribute to acid rain. Srubber and Catalytic Convertor used to eliminate gaseous pollutant.

- Wet scrubbers, or flue gas desulphurization systems, remove sulphur dioxide, a major cause of acid rain, by spraying flue gas with limestone and water.
- Catalytic converters are used in exhaust systems to provide a site for the oxidation and reduction of toxic by-products (like nitrogen oxides, carbon monoxide, and hydrocarbons) of fuel into less hazardous substances such as carbon dioxide, water vapor, and nitrogen gas.

iii. **Other Control Mechanism**

- Clean coal technology seeks to reduce harsh environmental effects by using multiple technologies to clean coal and contain its emissions.
- Some clean coal technologies purify the coal before it burns.
- One type of coal preparation, coal washing, removes unwanted minerals by mixing crushed coal with a liquid and allowing the impurities to separate and settle.
- Other systems control the coal burn to minimize emissions of sulphur dioxide, nitrogen oxides and particulates.
- Gasification avoids burning coal altogether. With gasification, steam and hot pressurized air or oxygen combine with coal in a reaction that forces carbon molecules apart.
- The resulting syngas, a mixture of carbon monoxide and hydrogen, is then cleaned and burned in a gas turbine to make electricity.
- Low-NOx (nitrogen oxides) burners reduce the creation of nitrogen oxides, a cause of ground-level ozone, by restricting oxygen and manipulating the combustion process.

Self Evaluation

1. Which of the following is considered as a secondary air pollutant?

   a) Nitric oxide b) Ozone
   c) Sulphur di oxide d) Carbon monoxide

2. Which of the following is non – Vehicular pollutant?

   a) Chloroflurocarbon b)Carbon–monoxide
   c) Hydrocarbon d) Particulate matter

3. One of the parameters used to characterize the air quality at a location is PM2.5. Here, the suffix '2.5' refers to (June 2019)

   a) Average number of suspected particles in 1.0cm3 of air
   b) Size of suspended particles in certain units
   c) Concentration of oxides of sulphur and nitrogen
   d) Concentration of suspended particles in 2.5cm3 of air

4. TajMahal is mainly threatened by the deleterious effects of

   a) Sulphur dioxide b) Chlorine
   c) Oxygen d) Hydrogen

5. In the formation of surface Ozone, which of the following do play an important role?(June2019)

   (i) Oxides of nitrogen (ii) Oxides of sulphur
   (iii) Sunlight (iv) Carbon Monoxide

Choose the correct answer from the code given below:

   a) (i), (ii), (iii) b) (ii), (iii) (iv)
   c) (i), (iii), (iv) d) (i), (ii), (iv)

6. Plants suitable for bio monitoring of sulphur dioxide pollution are

   a) Tomato and lettuce,
   b) Apricot, peach and gladiolus
   c) Tobacco, grapes and garden bean.
   d) White pine, moss and lichens

7. Which of the following statements about photochemical smog is wrong?

   a) It has high concentration of oxidising agents.
   b) It has low concentration of oxidising agent.
   c) It can be controlled by controlling the release of NO_2, hydrocarbons, ozone etc.
   d)) Plantation of some plants like pinus helps in controlling photochemical smog

8. Methane a greenhouse gas, is emitted from (Dec 2019)

   i) Landfills
   ii) Construction debris
   iii) Wetlands
   iv) E – waste

Choose the correct statements from the options given below:

   a) (i), (ii) and (iv) b) (i), (iii), and (iv)
   c) (i) and (iii) only d) (i) and (iv) only

9. The most dominant source of Benzene emissions in ambient air is (December 2019)

   a) Cement industry
   b) Cigarettes
   c) Car exhausts
   d) Paints and varnish

10. Which of the following air pollutants are produced from room deodorizers? (December 2019)

    a) Inhalable particulate matter
    b) Carbon monoxide
    c) Ozone
    d) Volatile organic compounds

11. The increasing amount of carbon dioxide in the air is slowly raising the temperature of the atmosphere, because it absorbs

    a) The water vapour of the air and retains its heat
    b) The ultraviolet part of the solar radiation
    c) All the solar radiations
    d) The infrared part of the solar radiation

12. In the cities of our country, which among the following atmospheric gases are normally considered in calculating the value of Air Quality Index?

    1. Carbon dioxide
    2. Carbon monoxide
    3. Nitrogen dioxide
    4. Sulphur dioxide
    5. Methane

Select the correct answer using the code given below.

    a) 1, 2 and 3 only b) 2, 3 and 4 only
    c) 1, 4 and 5 only d) 1, 2, 3, 4 and 5

13. Identify the air pollutant in urban areas which irritates eyes and also respiratory tract of human beings.

a) Particulate matter b) Oxides of nitrogen
c) Surface ozone d) Carbon monoxide

14. Which one of the following greenhouse gases has the shortest residence time in the atmosphere?

a) Chlorofluorocarbon
b) Carbon dioxide
c) Methane
d) Nitrous oxide

15. Which of the following best describes the mechanism of the greenhouse effect in earth's atmosphere?

a) Ultraviolet radiation from the sun is absorbed by Ozone layer in the stratosphere.

b) Gamma radiation from the sun is absorbed at ground level by dust particles in the atmosphere.

c) Cosmic radiation from the space is absorbed by gases in the atmosphere.

d) Infrared radiation from earth's surface is absorbed by gases in the atmosphere

16. Inside rural homes, the source/sources of Nitrogen Oxide Pollution may be:

a) Unvented gas stoves
b) Wood stoves
c) Kerosene heaters

Choose the correct code:

(a) (a) and (b) only (b) (b) and (c) only
(c) (b) only (d) (a), (b) and (c)

17. Dioxins are produced from

a) Wastelands
b) Power plants
c) Sugar factories
d) Combustion of plastics

18. Question With reference to 'fly ash' produced by the power plants using the coal as fuel, which of the following statements is/are correct? (July 2018)

1. Fly ash can be used in the production of bricks for building construction

2. Fly ash can be used as a replacement for some of the Portland cement contents of concrete

3. Fly ash is made up of silicon dioxide and calcium oxide only and does not contain any toxic elements.

Select the correct answer using the code given below

a) 1 and 2 b) 2 only
c) 1 and 3 d)3 only

19. Which of the following is considered as Green House gas

a) NO b) NO_2
c) N_2O d) Nitrogen

Answer Key

1	2	3	4	5
B	A	B	A	A
6	7	8	9	10
D	B	C	C	D
11	12	13	14	15
D	B	C	C	D
16	17	18	19	
D	D	A	C	

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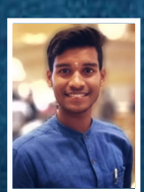

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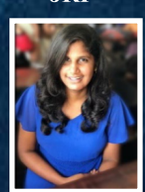

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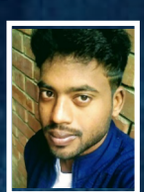

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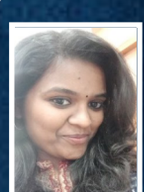

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WATER POLLUTION

Water pollution is any contamination of water with chemicals or other foreign substances that are detrimental to human, plant, or animal health. These pollutants include fertilizers and pesticides from agricultural runoff; sewage and food processing waste; lead, mercury, and other heavy metals; chemical wastes from industrial discharges; and chemical contamination from hazardous waste sites. **The substances that pollute water are called water pollutants**.

Water pollution is caused by a variety of human activities such as industrial, agricultural and domestic. Agricultural runoff laden with excess fertilizers and pesticides, industrial effluents such as lead, mercury, and other heavy metals, chemical wastes toxic with substances and sewage water with human and animal wastes pollute our water thoroughly.

Natural sources of pollution of water are soil erosion, leaching of minerals from rocks and decaying of organic matter. Rivers, lakes, seas, oceans, estuaries and ground water sources may be polluted by point or non-point sources.

When the water in our rivers, lakes, and oceans becomes polluted; it can endanger wildlife, make our drinking water unsafe, and threaten the waters where we swim and fish. For the Prevention and Control of water pollution -The Water Act was created in the year of 1974.

Types of Pollutants

Point source – When pollutants are discharged from a specific location or from a single identifiable source, such as a drain pipe carrying industrial effluents discharged directly into a water body it represents point source pollutant.

Example: Industrial discharge, factory smoke stack, municipal sewage etc.

Non-point sources – In contrast non-point sources include discharge of pollutants from diffused sources or from a larger area such as run off from agricultural fields, grazing lands, construction sites, abandoned mines and pits, roads and streets.

Measurement of water quality parameters:

DO - Dissolved Oxygen

- DO is a measure of how much oxygen is dissolved in the water - the amount of oxygen available to living aquatic organisms. The amount of dissolved oxygen in a stream or lake can tell us a lot about its water quality.
- A number of factors like surface turbulence, photosynthetic activity, O_2 consumption by organisms and decomposition of organic matter are the factors which determine the amount of DO present in water.
- Presence of organic and inorganic wastes in water decreases the dissolved Oxygen (DO) content of the water.

BOD - Biological Oxygen Demand

- Biochemical oxygen demand (BOD) represents the amount of oxygen consumed by bacteria and other microorganisms while they decompose organic matter under aerobic (oxygen is present) conditions at a specified temperature.
- The higher value of BOD indicates low DO content of water.

COD- Chemical Oxygen Demand

The COD indicates the amount of oxygen which is needed for the oxidation of all organic (biodegradable and non-biodegradable) and oxidizable inorganic substances in water in mg/l or g/m^3.Chemical oxygen demand (COD) is a slightly better mode used to measure pollution load in water.

ENERGY RESOURCES

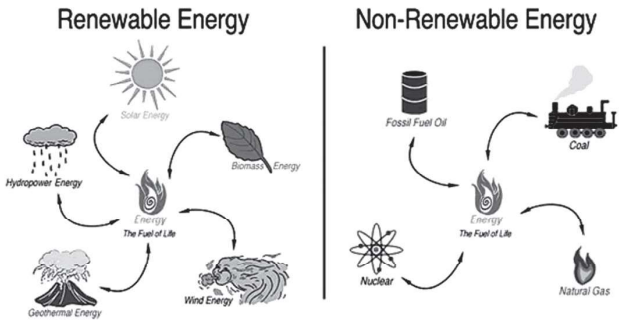
Energy is the **capacity of a physical system to perform work.** Energy exists in several forms such as heat, kinetic or mechanical energy, light, potential energy, electrical, or other forms. Energy is the ability to do work. Energy is one of the most important components of economic infrastructure. In a developing economy, the energy demand is high from sectors like agriculture, industry, residential and economical. Energy resources are very much necessary for the existence of mankind.

Based upon their capacity to regenerate, they can be classified into renewable and nonrenewable energy resources.

A) Renewable energy sources

Renewable energy sources are inexhaustible and are available in unlimited amount in nature since these can be renewed (i.e. regenerated in natural process) over relatively short period of time.

i.e. they can be replaced after we use them and can produce energy again and again. These include, firewood (or fuel wood) obtained from forest, petro plants, plant biomass (as agricultural wastes like bagasse), animal dung, solar energy, wind energy, water energy (hydro-electrical, ocean wave and tidal energy), and geothermal energy etc.



B) Non-renewable (Exhaustible) Energy Resources:

Non-renewable energy resources are available in limited amount and develop over a longer period of time **(cannot be regenerated over a short period of time)**. As a result of unlimited use, they are likely to be exhausted one day.

These include:

- Various fossil fuels (petroleum products, coal and natural gas and nuclear energy)
- The global resources of fossil fuel, uranium and thorium are limited and will be eventually be depleted.
- other examples include salts, metals, phosphorus, iron and other minerals. (tin, mica, titanium and bauxite).

Moreover, use of fossil fuels for energy has negative environmental consequences, such as air pollution, global warming, acid rains and oil spills. Thus, it has been become essential to minimize the use of fossil fuels and to replace them with renewable resources.

Based upon their usage they can be classified into Conventional and non-Conventional energy resource.

A) Conventional Sources of Energy

The sources of energy which **have been in use for a long time.** e.g., coal, petroleum, natural gas, firewood and water power. They are **exhaustible** except water and firewood. So water and firewood is conventional and non-exhaustible / Renewable (exceptional). They cause pollution when used, as they emit smoke and ash. They are very expensive to be maintained, stored and transmitted as they are carried over long distance through transmission grid and lines. The conventional sources of energy are generally non-renewable sources of energy, which are being used since a long time. These sources of energy are being used extensively in such a way that their known reserves have been depleted to a great extent. At the same time it is becoming increasingly difficult to discover and exploit their new deposits.

Along with the coal, petroleum and natural gas, electricity is conventional source of energy, which is playing a barometer of a nation's economic well-being. Availability of abundant electricity means unrestricted growth of industries, transport and agriculture. Depending upon raw material used, various types of electricity are hydroelectricity, thermal electricity (steam, gas, oil) and nuclear electricity.

B) Non-Conventional Sources of Energy

The sources of energy **which have been in use for a short time.** The resources which are yet in the process of development over the past few years. e.g., solar, wind, tidal, biogas, and biomass, geothermal. They are **inexhaustible.** They are costly during installation and are cost effective in the long run. The Energy Department is developing new technologies that will store renewable energy for use when the wind isn't blowing and the sun isn't shining. They are generally pollution free. For instance Fuel cells use the energy from hydrogen in a highly efficient way with only water and heat as by products.

Note- Soil is both Renewable and Non Renewable Resources.

- If the Fertility of the soil is removed, it can be replenished within 3 to 6 month. Hence it is renewable.
- If the top layer of the soil is removed then it takes few decades to replenish. Hence soil is non renewable

Conventional resources of Energy	• The resources which are commonly/widely used for a long time and constitute the major source of energy • Examples → Coal, Oil, Natural gas, Wood etc. • Limited, Non-renewable, Costly, Cause Pollution & Exhaustible
Non-conventional resources	• The resources which are not used widely and people are getting practiced to it with upcoming new technology. • Solar Energy, Wind Energy, Tidal Energy, Geothermal Energy, OTEC (Ocean thermal energy conversion) etc. • Renewable, Pollution free & Inexhaustible
Renewable sources of Energy	• The resources that can be renewed or recharged in a short span of time • Solar Energy, Wind Energy, Tidal Energy, Fish, Trees, Biological diversity etc.
Non Renewable sources of Energy	• The resources that cannot be renewed or recharged in a short span of time. It takes millions of years to recharge • Fossils (Coal, Gas), Minerals, Nuclear Power, Tin, Natural gas, Salt etc.

Energy Conversion Process:

Energy conversion is the process of changing one form of energy to another. There are two methods of conversion:

- **Direct- when heat energy is converted directly into electricity**

A principle of direct method is thermoelectric effect that includes three separately identified effects: the Seebeck effect, the Peltier effect and the Thomson effect. In case of heat energy conversion into electricity, the principle is Seebeck effect.

Example of Direct energy conversion is Photovoltaic cell, Fuel cell, Wind Energy, Nuclear Fusion Energy

- **Indirect- when heat energy is converted into mechanical energy first and afterwards into electricity.**

A principle of indirect method- For indirect method, first heat energy is converted to mechanical energy. The principle is gas compression and expansion due to temperature change that is used i.e.: steam engine. The engine is based on the fundamental physical phenomena. The next step is to convert mechanical energy into electricity. The principle is electromagnetic induction that produces an electromotive force across a conductor when it is exposed to a time varying magnetic field. Electromagnetic induction is used in i.e.: generators. Example of Indirect energy conversion is Thermal power plant, Nuclear Fission, Hydro power plant.

The current availability of biomass in India is estimated at about 500 million metric tonnes per year. Studies sponsored by the Ministry has estimated surplus biomass availability at about 120 – 150 million metric tonnes per annum covering agricultural and forestry residues corresponding to a potential of about 18,000 MW. This apart, about 5000 MW additional power could be generated through bagasse based cogeneration in the country's 550 Sugar mills

National Energy Policy

Sector	MW	% of Total
Central sector	94,027	25.3%
State Sector	103,652	27.9%
Private Sector	174,298	46.9%
Total	3,71,977	

Present Installed Capacity- Category wise

Fuel	MW	% of Total
Total Thermal	2,31,456	62.2%
Coal	1,99,595	53.7%
Lignite	6,360	1.7%
Gas	24,992	6.7%
Diesel	510	0.1%
Hydro (Renewable)	45,699	12.3%
Nuclear	6,780	1.8%
RES (MNRE)	88,042	23.7%
Total	371,977	

*** Installed capacity in respect of RES (MNRE) as on August 2020.**

RES (Renewable Energy Sources) include Small Hydro Project, Biomass Gasifier, Biomass Power, Urban & Industrial Waste Power, Solar and Wind Energy.

Renewable Energy Targets

As per INDC target, the percentage of non-fossil fuel in installed capacity is to be 40% by 2030Towards realizing the objective of carbon free energy, India has set for itself a target of installed capacity of 175 GW from Renewable Energy Sources (RE) by March 2022.

The government set a renewable capacity goal of 175 GW by 2022, targeting 60 GW of utility-scale solar photovoltaic (PV), 40 GW of rooftop solar PV, 60 GW of wind power, 5 GW of small hydro and 10 GW of bioenergy. It plans for 227 GW by 2022 (114 GW of solar, 67 GW of wind,31 GW of floating solar and offshore wind, 10 GW of bioenergy and 5 GW of small hydro).By 2019 India had a total installed renewable electricity capacity of 80 GW, and in the same year India announced its ambition to increase its renewable energy capacity to 450 GW.

Installed grid interactive renewable power capacity (excluding large hydropower) (RES MNRE) and renewable energy target 2022

Source	Total Installed Capacity (MW)	2022 Target (MW)	2022 Target (GW)
Small hydropower	4,604	5,000	5
Waste - to - Power	138	10,000	10
Biomass power (Biomass & Gasification and Bagasse Cogeneration)	9,806		
Wind power	38,368	60,000	60
Solar power	29,549	1,00,000	100
TOTAL	80,467	1,75,000	175

India's renewable energy target with large hydro power is 225 GW.

The target is given for "bio power" which includes biomass power and waste to power generation

INTERNATIONAL CONVENTIONS ON ENVIRONMENT

- **Convention** is a large meeting of people who come to talk about their shared work, common interests or to make decisions as a group.
- **Conference** is a meeting that is generally designed for discussion, problem solving, fact-finding and consultation
- A **Protocol** to the convention is an agreement that diplomatic negotiators formulate and sign as the basis for a final convention where the parties set specific aims or legal obligations. Usually, when a major provision is to be incorporated on regulations of the convention, a protocol is called among the countries, who are signatory of the original convention when it was signed and approved.

United Nations Conference on the Human Environment (Stockholm Conference)-1972

The United Nations Conference on the Human Environment (also known as the Stockholm Conference) was an international conference convened under United Nations auspices held in Stockholm, Sweden from June 5-16, 1972. Hence **June 5th** is celebrated as **World Environment Day** every year. It was the UN's first major conference on international environmental issues, and marked a turning point in the development of international environmental politics.

Outcome of this summit were

i. The meeting agreed upon a Declaration containing **26 principles** concerning the environment and development, an Action Plan with **109 recommendations,** and a Resolution.

ii. The **United Nations Environment Programme** has been established by the United Nations General Assembly in pursuance of the Stockholm Conference.

iii. The Indian Prime Minister Indira Gandhi in her seminal speech in the conference brought forward the connection between ecological management and poverty alleviation.

The United Nations Environmental Programme (UNEP)

The United Nations Environmental Programme (UNEP) was founded in June 1972 as a result of the Stockholm Conference on the Human Environment, **Headquartered in Nairobi, Kenya.** The UNEP is the coordinating body for the United Nations' environmental activities.

Significant role played by UNEP

i. It has played a significant role in identifying and analyzing global environmental problems, developing regional and international environmental programs and conventions, and promoting environmental science and information.

ii. Among its most important tasks is assisting developing countries in implementing environmentally sound policies and practices. UNEP acts as a catalyst, advocate, educator and facilitator to promote the wise use and sustainable development of the global environment.

iii. **The World Meteorological Organization and UN Environment program established the Intergovernmental Panel on Climate Change (IPCC) in 1988.**

iv. UNEP's main activities are related to seven broad thematic areas: climate change, disasters and conflicts, ecosystem management, environmental governance, environment under review, harmful substances resource efficiency.

v. UN Environment is also one of several Implementing Agencies for the Global Environment Facility **(GEF)** and the Multilateral Fund for the Implementation of the Montreal Protocol, and it is also a member of the United Nations Development Group.

- **Vienna convention (1985)** - The Convention was adopted by the Conference on the Protection of the Ozone Layer and open for signature at Vienna from 22 March 1985. It provided frameworks for international reductions in the production of chlorofluorocarbons due to their contribution to the destruction of the ozone layer, resulting in an increased threat of skin cancer. It entered into force in September 1988.
- **The Montreal Protocol (1987)** - A global agreement to protect the stratospheric ozone layer by phasing out the production and consumption of nearly 100 man-made chemicals referred to as ozone depleting substances (ODS). It entered into force on 26 August 1989.
- **The Kigali Amendment (2016)** - Aims for the phase-down of hydro fluorocarbons (HFCs) by roughly 80-85% from their respective baselines, till 2045. Kigali agreement is an amendment to Montreal Protocol. It entered into force on 1st January 2019.

ISA – International Solar Alliance

- The International Solar Alliance (ISA) is an alliance of 121 countries initiated by India.
- Most of them being **(Tropical Countries)** sunshine countries, which lie either completely or partly between the Tropic of Cancer and the Tropic of Capricorn.
- The primary objective of the alliance is to work for efficient exploitation of solar energy to reduce dependence on fossil fuels.
- This initiative was first proposed by Indian Prime Minister Narendra Modi in a speech in **November 2015 at Wembley Stadium, in which he referred to sunshine countries as Suryaputra ("Sons of the Sun")**
- The initiative was launched by Prime Minister Narendra Modi at the India Africa Summit, and a meeting of member countries ahead of the 2015 United Nations Climate Change Conference in Paris in November 2015. **It is headquartered in India.**
- In January 2016, Narendra Modi, and the then French President François Hollande jointly laid the foundation stone of the ISA Headquarters and inaugurated the interim Secretariat at the National Institute of Solar Energy (NISE) in GwalPahari, Gurugram, India.
- India has pledged a target of installing 100 GW by 2022 and reduction in emission intensity by 33–35% by 2030 to let solar energy reach to the most unconnected villages and communities and also towards creating a clean planet. **85 countries have signed the ISA Framework Agreement, 64 countries have signed and ratified** the ISA Framework Agreement.

ENVIRONMENT RELATED ACTS IN INDIA

India participated in the United Nations Conference on the Human Environment held in Stockholm in June 1972 to take appropriate steps for the preservation of the natural resources of the earth which, among other things, include the preservation of the quality of air and control of air pollution. Based on the concluding guidelines of this conference, the Water Act& Air Act was formulated by the government of India.

The Water (Prevention and Control of Pollution) Act of 1974

- This is an Act to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water through various management guidelines and restrictions.

Self Evaluation

1. One of the main outcome of the Rio +20 conference was to develop a set of
   a) Sustainable Development Goals
   b) Millennium Development Goals
   c) National Developmental Strategy
   d) National Land Restoration Strategy

2. Which one of the following conferences/ summit is also known as UN conference on Sustainable Development (UNCSD)?
   a) The Stockholm Conference 1972
   b) The Rio de Janerio Conference 1992
   c) The Johannesburg Summit, 2002
   d) The Rio + 20 Conference, 2012

3. What is the other name of Earth Summit?
   a) Geneva Summit b) Brasilia Summit
   c) Rio Summit d) World Summit

4. In which of the following date "World Water Day" is observed?
   a) March 20th b) March 21st
   c) March 22nd d) March 23rd

5. When did Kyoto protocol adopted?
   a) 1996 b) 1997
   c) 2000 d) 2007

6. Which of the following greenhouse gases is/ are not included under Kyoto Protocol?
   a) Methane b) Nitrous Oxide
   c) Hydro-Fluorocarbon d) Ozone

7. Montreal protocol aims at
   a) Reduction in emissions of greenhouse gases
   b) Phasing out ozone depleting substances
   c) Prohibiting transboundary movement of hazardous waste
   d) Enhancing cooperation among UN members states for peaceful uses of nuclear energy

8. Which of the following indicate the objective of the United Nations Framework convention on Climate Change (UNFCCC)?
   a) To Stabilize greenhouse gases concentration in the atmosphere
   b) To prescribe limits on greenhouse gas emissions for individual countries
   c) To lay down enforcement mechanisms
   d) To prepare guidelines for formulation of Climate Action Plan by member countries

9. Under Kyoto Protocol, the first commitment period for reduction of greenhouse gas emissions by 37 industrialized and European community countries was:
   a) 1997 – 2005 b) 2000 – 2012
   c) 2008 – 2012 d) 2005 – 2015

10. Which of the following was not part of Earth Summit Agreements of 1992?
    a) Climate Change Framework
    b) Inclusive Development
    c) Sustainable Development
    d) Earth Charter

11. The Cartagena Protocol is regarding safe use, transfer and handling of:
    a) Nuclear waste
    b) Invasive Alien Species
    c) Living Modified Organisms(LMOs)
    d) Toxic bye-products and industrial effluents

12. International Solar Alliance was established to develop co-operation in developing solar energy was proposed by:
    a) Indian Prime Minister
    b) French President
    c) African Union
    d) European Union

Answer Key

1	2	3	4	5
A	D	C	C	B
6	7	8	9	10
D	B	A	C	B
11	12			
C	A			

agenda for Sustainable Development" was adopted at the United Nations Sustainable Development Summit. SDGs is the outcome of the Rio+20 conference (2012) held in Rio De Janerio and is a **non-binding document.**

Through the pledge to **Leave No One Behind,** countries have committed to fast-track progress for those furthest behind first. That is why the SDGs are designed to bring the world to several life-changing 'zeros', including zero poverty, hunger, AIDS and discrimination against women and girls.

17 SUSTAINABLE DEVELOPMENT GOALS AND THEIR AIMS

Goal 1	End poverty in all its forms everywhere
Goal 2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 3	Ensure healthy lives and promote well-being for all at all ages
Goal 4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Goal 5	Achieve gender equality and empower all women and girls
Goal 6	Ensure availability and sustainable management of water and sanitation for all
Goal 7	Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 10	Reduce inequality within and among countries
Goal 11	Make cities and human settlements inclusive, safe, resilient and sustainable
Goal 12	Ensure sustainable consumption and production patterns
Goal 13	Take urgent action to combat climate change and its impacts*
Goal 14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Goal 16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Goal 17	Strengthen the means of implementation and revitalize the global partnership for sustainable development

NATURAL HAZARDS AND DISASTERS: MITIGATION STRATEGIES

What is Hazards?

Hazard may be defined as "a dangerous condition or event, that threat or have the potential for causing injury to life or damage to property or the environment." It does not necessarily cause any destruction.

How Hazards are classified?

Hazards can be grouped into two broad categories namely natural and manmade.

- **Natural Hazards**

Natural Hazards are elements of circumstances in the Natural environment that have the potential to cause harm to people or property or both. These may be swift or permanent aspects of the respective environmental settings like currents in the oceans, steep slope and unstable structural features in the Himalayas or extreme climatic conditions in deserts or glaciated areas.

For example flooding may be caused because of heavy rains, landslide or blocking of drains with human waste.

- **Manmade hazards**

Manmade hazards are due to human negligence. Manmade hazards are associated with industries or energy generation facilities and include explosions, leakage of toxic waste, pollution, dam failure, wars or civil strife etc.

What is Disasters?

"When there is harm to life and property of humans, the hazard is termed a disaster"

DEFINITION

"Any occurrence that causes Damage, ecological disruption, Loss of human life, Deterioration Of health and health services On a scale sufficient to Warrant an extraordinary Response from outside the Affected community" – WHO

"Disaster is an undesirable occurrence resulting from forces that are largely outside human control, strikes quickly with little or no warning, which causes or threatens serious disruption of life and property including death and injury to a large number of people, and requires therefore, mobilization of efforts in excess of that which are normally provided by statutory emergency services".

Generally, disasters are generalized experiences of people the world over, and no two disasters are similar and comparable to each other. Every disaster is unique in terms of the local socio-environmental factors that control it, the social response it generates, and the way each social group negotiates with it.

Types of Hazards

- Geophysical- Earthquake, Mass Movement (dry), Volcanic activity
- Meteorological- Extreme Temperature, heat wave, Fog, Storm
- Hydrological- Flood, Landslide, Wave action
- Climatological- Drought, Glacial Lake Outburst, Wildfire
- Biological- Epidemic ,Insect infestation, Animal Accident
- Geological Hazard- Earthquake, Tsunami, Volcanic eruption, Landslide, Dam burst, Mine Fire
- Water & Climatic Hazards- Tropical Cyclone, Tornado and Hurricane, Floods, Drought, Hailstorm, Cloudburs, Landslide, Heat & Cold wave, Snow Avalanche, Sea erosion
- Environmental Hazard- Environmental pollutions, Deforestation, Desertification, Pest Infection
- Biological- Human / Animal Epidemics, Pest attacks, Food poisoning, Weapons of Mass Destruction

c. Capacity-building;

d. Preparedness to deal with any disaster;

e. Prompt response to any threatening disaster situation or disaster;

f. Assessing the severity or magnitude of effects of any disaster; evacuation, rescue and relief;

g. Rehabilitation and reconstruction

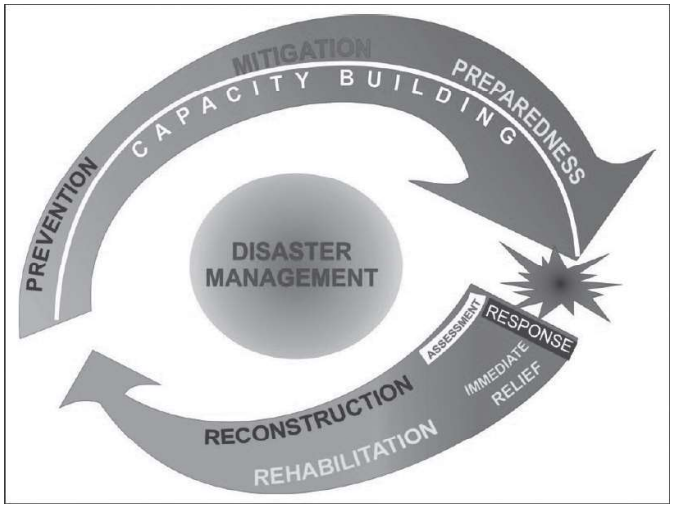
There will be a paradigm shift, from theerstwhile relief-centric response to a proactive prevention, mitigation and preparedness-driven approach for conserving developmental gains and to minimise loss of life, livelihood and property.

II) DISASTER MANAGEMENT CYCLE

Disaster Management can be defined as the organization and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular preparedness, response and recovery in order to lessen the impact of disasters. Disaster management includes administrative decisions and operational activities thatinvolve these six main activities as basic disaster management cycle.

1. Prevention
2. Mitigation
3. Preparedness
4. Response
5. Rehabilitation
6. Reconstruction

Disaster management involves all levels of government. Nongovernmental and community-based organizations play a vital role in the process. Modern disaster management goes beyond post-disaster assistance. It now includes pre-disaster planning and preparedness activities, organizational planning, training, information management, public relations and many other fields. Crisis management is important, but is only a part of the responsibility of a disaster manager. The newer paradigm is the Total Risk Management (TRM) which takes a holistic approach to risk reduction.



i. Key Phases of Disaster Management

There are three key phases of activity within disaster management:

a. Before a disaster (pre-disaster).

Activities taken to reduce human and property losses caused by a potential hazard. For example carrying out awareness campaigns, strengthening the existing weak structures, preparation of the disaster management plans at household and community level etc. Such risk reduction measures taken under this stage are termed as mitigation and preparedness activities.

b. During a disaster (disaster occurrence).

Initiatives taken to ensure that the needs and provisions of victims are met and suffering is minimized. Activities taken under this stage are called emergency response activities.

c. After a disaster (post-disaster)

Traditionally people think of disaster management only in term of the emergency relief period and post disaster rehabilitation. Instead

V. DISASTER MANAGEMENT AT NATIONAL LEVEL

The response from the Central Government is based keeping in view the following factors:

1. The gravity of the disaster

2. The scale of the relief operations

3. The requirements of the Central assistance for augmenting financial resources and logistics support at the disposal of the State Government.

The Ministry of Home Affairs is the Nodal Ministry at the Centre for coordinating disaster management activities for all natural hazards except drought which is taken care by Ministry of Agriculture under the Department of Agriculture and Cooperation. Other Ministries are assigned the responsibility of providing emergency support in case of disasters that fall within their preview.

SL. No	Disaster	Nodal ministry
1	Natural Disasters (other than drought)	Ministry of Home Affairs
2	Drought	Ministry of Agriculture
3	Air Accidents	Ministry of Civil Avaiation
4	Railway Accidents	Ministry of Railways
5	Chemiacal Disasters	Ministry of Home Affairs
6	Biological Disasters	Ministry of Home Affairs
7	Nuclear	Ministry of Home Affairs
8	Epidemics	Ministry of Health and Family Welfare

Self Evaluation

1. Tropical Cyclones are intense low pressure areas confined to the area lying between
   a) 30 degree north and 30 degree south.
   b) 50 degree north and 50 degree south.
   c) 50 degree north and 30 degree south.
   d) 5 degree north and 5 degree south.

2. Statement I: Earthquake 'A' is 5 on Richter scale and Earth quake "B' is 8 on the same scale. Earthquake 'B' has 1000 times the wave amplitude compared to 'A'. (June 2019)
   Statement II: The energy released in 'B' is three times that of 'A'
   Choose the correct option:
   a) Statement I is correct and Statement II is incorrect
   b) Statement I and II are correct
   c) Statement II is correct and I is incorrect
   d) Statement I and II are incorrect

3. Which of the following belongs to the category of geophysical hazards?
   a) Infestation b) Avalanches
   c) Invasive species d) Disease

4. An earthquake is rated as 'major' if its magnitude in Richter scale is in the range of (December 2018)
   a) 4.0 – 4.9 b) 6.0 – 6.9
   c) 7.0 – 7.9 d) 5.0 – 5.9

5. In the last few years, India has been affected by which of the following tropical cyclones? (June 2019)
   a) Gaja, Hudhud, Bhima
   b) Hudhud, Bhima, Ocki
   c) Gaja, Hudhud, Ockhi
   d) Gaja, Bhima, Ockhi

6. Which of the following types of natural disasters has no definite beginning and end? (July 2018)
   a) Earthquakes b) Landsides
   c) Hurricanes d) Droughts

7. National Disaster Management Authority is an agency of the Ministry of (June 2019)
   a) Jal Shakti
   b) Home Affairs
   c) Earth Science
   d) Housing and Urban Affairs

8. The National Disaster Management Authority (NDMA) is headed by
   a) Prime Minister of India
   b) President of India
   c) Governor of States
   d) Chief Minister of States

9. Which of the following is not a man-made hazard?
   a) Leakage of Toxic waste
   b) Wars and Civil Strife
   c) Drought
   d) Environmental Pollution

10. Cyclones occurring in North Atlantic Ocean are called
   a) Typhoon b) Hurricanes
   c) Tornado d)None of the above

11. Generally the number on Richter scale ranges between –
   a) 0 and 6 b) 0 and 9
   c) 1 to 5 d) 1 to 12

12. Tsunami's can occur only during
   a) Evening
   b) Afternoon
   c) Any time of the day or night
   d) Morning

13. The cycle of disaster consists of the following components
   a) Mitigation, Preparedness, Response, Recovery
   b) Preparedness, vulnerability assessment, risk assessment, recovery
   c) Mitigation, Risk assessment, Response and Recovery
   d) None of the above

14. The Disaster Management Act was made in
   a) 2006 b) 2003
   c) 2005 d) 2009

15. The point of the earth's surface directly above the point where an earthquake occurs is called the:
   a) Focus b) Epicentre
   c) Fracture d) Fault

16. Match the following environmental disasters with the words or phrase associated with them(June 2019)

List – I	list - II
a. Bhopal gas tragedy	(i) dumping of Hazardous substances
b. Chernobyl disaster	(ii) Peroxyacetyl Nitrates (PAN)
c. Love canal tragedy	(iii) Nuclear accident
d. Los angeles smog	(iv) Mehtyl Iso cyanide

Choose the correct option from those given below

   a) (a) – (ii), (b)-(iii), (c) –(iv), (d) – (i)
   b) (a) – (iv), (b)-(iii), (c) –(i), (d) – (ii)
   c) (a) – (ii), (b)-(i), (c) –(iv), (d) – (ii)
   d) (a) – (iv), (b)-(i), (c) –(iii), (d) – (ii)

17. Vulnerability analysis comes in which part of the Disaster Management Cycle
   a) Mitigation b) Preparedness
   c) Response d) Recovery

18. Floods can be prevented by
   a) Afforestation
   b) Cutting the forest
   c) Tilling the land
   d) Removing the top soil

19. In India, Cyclone is tracked through which satellite?
   a) SCATSAT-1
   b) IRS
   c) Ocean SAT
   d) None of the above

Answer Key

1	2	3	4	5
A	B	B	C	C
6	7	8	9	10
D	B	A	C	B
11	12	13	14	15
B	C	A	C	B
16	17	18	19	
B	A	A	A	

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1 HIGHER EDUCATION SYSTEM

The role of higher education in sustainable economic and social development increases year by year. Higher education can be seen as a focal point of knowledge and its application, which makes a great contribution to the economic growth and development through fostering innovation and escalating various skills. Higher education is broadly defined as one of the key drivers of growth performance, prosperity and competitiveness.

Modern universities provide students with various programmes aimed at preparing them for different economic sectors, helping them to stay and progress in the labour market for long and programmes that make a difference for labour market outcomes and keep pace with changes in the global economy and changes in the innovation process. Universities promote lifelong learning; they offer opportunities to engage and attract students into training and professional development.

Higher education institutions assure the relevance of their knowledge, identifies skill gaps, create special programmes and build the right skill that can help them to improve economic prosperity and social cohesion, adapt workforce development to the economy and changing demand for the new skills, develops relevant skills and activate skill supply, and thus support improvement in productivity and growth.

Knowledge is the true basis of higher education; its production via research, its transmission via teaching, its acquisition and use by students. Hence, excellence must remain the prime objective of any institution of higher education, including universities in any country.

These institutions are focusing resources on quality education, encouraging students and taking account of students' profiles and specific needs, strengthening teacher training and exposure to best working practices and creating incentives to attract the most experienced teachers.

Countries are putting knowledge at the service of their societies to create a better world. This can be achieved through the training of first-class minds, through major advances in science and technology and by encouraging an interest in learning. Now, to realize full potential and importance of Higher Education is to maintain a pro-active stance, strengthen its position as bedrock upon which countries are and build a new road to growth. Thus this unit is much important for an Assistant Professor who really designs and shapes the world by carving the platform of every student and learners.

SYLLABUS

- Institutions of higher learning and education in ancient India.
- Evolution of higher learning and research in Post Independence India.
- Oriental, Conventional and Non-conventional learning programmes in India.
- Professional, Technical and Skill Based education.
- Value education and environmental education.
- Policies, Governance, and Administration.

This study material has been prepared after the thorough analysis of syllabus and previous year Questions.

INSTITUTIONS OF HIGHER LEARNING AND EDUCATION IN ANCIENT INDIA

Introduction

Ancient education system focuses on the holistic development of the individual by taking care of both the inner and the outer self. The system focuses on the moral, physical, spiritual and intellectual aspects of life. It emphasises on values such as humility, truthfulness, discipline, self-reliance and respect for all creations. Students are taught to appreciate the balance between human beings and nature. Teaching and learning follows the tenets of Vedas and Upanishads fulfilling duties towards self, family and society, thus encompassing all aspects of life. The ancient system of education is the education of the Vedas, Brahmanas, Upanishads and Dharma sutras. The individual's supreme duty is thus to achieve his expansion into the absolute, his self-fulfilment. Thus, ancient Indian educational system is developed in terms of the needs of the individual and that of the society. It has a definite ideal and a definite mission.

Fundamentals of Ancient Education

Ancient Indian Education has been evolved strictly on the foundations of Indian epistemological and philosophical traditions. The ultimate aim of education emerged as the **Chitti-Vritti-nirodha** (the control of mental activities connected with the so called concrete world).

The major fundamental aspects are:

- **Knowledge related to life**

The student would not remain contended with mere bookish learning but acquire fairly practical knowledge of the world and society through close contact with the people.

- **Close association between teacher and student resulting in all round development**

Sitting at the feet of the teacher, would comprehend all the intricate problems of life through listening and meditation. The pupil, through such a close contact with the teacher, would naturally imbibe his qualities. This is regarded as indispensable for the fullest development of the pupil's personality because the teacher is supposed to symbolize all the good ideals, traditions and code of behaviour of the society from where the pupil hailed.

- **Development in social work**

The pupil's residence at the teacher's house helps them to develop social contacts through their sacred duty of collecting fuel- wood, supplying water and do other household jobs for the teacher. In this way, not only he receives instructions related to domestic life, but also learn the concrete lesson of the dignity of labour and social service.

- **Vocational training**

Students are given training in occupations of animal husbandry, agriculture and dairy farming etc. The modern concept of Learning by doing as understood in the West today is the very core and essence of education in ancient India.

The Four Vedas

The basis of Indian culture lies in the Vedas, which are four in number- Rigveda, Samaveda, Yajurveda and Atharvaveda. The Vedas are regarded as the oldest among the literatures of the world, are regarded the original sources of the philosophy of life in ancient India.

i. Rig-Veda - **"Knowledge of the Hymns of Praise",** for recitation.

ii. ii. Sama-Veda - **"Knowledge of the Melodies",** for chanting.

iii. Yajur-Veda - **"Knowledge of the Sacrificial formulas",** for liturgy.

iv. Atharva-Veda- **"Knowledge of the Magic formulas",** named after a kind of group of priests.

1. **In Rig Veda - Prajñānam Brahma :-** Also called Svarūpabodha-vākya. This means wisdom, intelligence and understanding is Brahman. This explains the nature of Brahman.
2. **In Yajur Veda - Aham Brahma Asmi:-** Also called Anusandhāna-vākya. This means I am Brahman or I am part of Brahman or I am manifestation of Brahman. This explains the nature of a person's mind.
3. **In Sāma Veda - Tat tvam Asi :-** Also called Upadeśa-Vākya. This means the self in its original state is wholly or partially identifiable or identical with Brahman. This explains the nature of self.
4. **In Atharva Veda - Ayam ātma Brahma:-** Also called Anubhava-bodha vākya. This means my consciousness is Brahman or my consciousness is part of Brahman. This explains the nature of spirit.

Vedic Education

Gurukul System

The Gurukul is a type of school in ancient education system. Their main motto is to develop the knowledge and they are highly focused on education. The Gurus train their students with meditations, yoga's and other standards. The teacher is called as a **Guru** and the students are called as **Shisyas**.

Main Objectives:

a. Self control
b. Character development
c. Social awareness
d. Personality development
e. Intellectual development
f. Spiritual development
g. Preservation of knowledge & culture

Students were divided into three categories like

a) Vasu- Those obtaining education up to the age of 24.

b) Rudra- Those obtaining education up to the age of 36.

c) Aaditya- Those obtaining education up to the age of 48.

Education is given at most importance and value during Vedic period. Boys are supposed to learn Upanishads, grammar, law and other language. After **Upanayam** or the **sacred thread ceremony** men are sent to gurukul for higher education. In this new home he is consider to born again, a second birth and is called **Dvijya** or **twice born**. After completing studies students have to give **Guru Dakshina** to the teacher. They are allowed to stay in gurukul till the age of 12 years. The discipline of **Brahmacharya** or **celibacy** is compulsory. Though a married youth is entitled to get education, yet he is denied the right of being the residential pupil. There is equality between the sexes in the field of knowledge. The Rig Veda mentions women who studies as **Brahmanavadinis**.

The knowledge is imparted by the Guru through regulated and prescribed pronunciation, which the pupil would commit to memory, having listened to it alternatively. Thus, the teaching is oral. Special attention is paid to the correct pronunciation of words, Pada or even letters.

Various subjects are incorporated in the curriculum of Vedic education. Grammar, rhetoric, astrology, logic, **Nirukti (etymological interpretation of words)** is the main subjects.

Vedang is the synonym of all these subjects taken together - the performance of sacrifice, correct pronunciation, knowledge of prosody, etymology, grammar, and jyotishi or the science of calendar. The study of logic occupied a special place, because knowledge of any other subject is tested on its basis. Debates and discussions are organized for training in logic.

Method of Teaching

Two methods of teaching are being practiced during the Vedic period. The first method is **Oral** and the second is based on **Chintan** i.e. **thinking**. In the oral method the students are to memorize the Mantras (Vedic hymns) and Richayas (verses of Rigveda) in order that they might not be changed wrongly and they might remain preserved in their original forms.

The thinking principle, **Manana Shakti** is reckoned higher than the subject of thinking. So the primary subject of education is the mind itself. According to the ancient Indian theory of education, the training of the mind and the process of thinking, are essential for the acquisition of knowledge. Education is reduced to the three simple processes of **Sravana, Manana** and **Niddhyaasana**.

- Sravana is listening to the truths as they fall from the lips of the teacher. Knowledge is technically called **Sruti** or what the ear hears and not what is seen in writing.
- The second process of knowledge called **Manana** implies that the pupil has to think out for themselves the meaning of the lessons imparted to them orally by the teacher so that they may assimilate fully.
- The third step known as **Niddhyasana** means complete comprehension by the pupil of the truth that is taught so that they may live the truth and not merely explain it by word. Knowledge must result in realization.

Education during later Vedic period

The basic aim of education during the Later-Vedic period has been the same as during the Vedic Age- the salvation of the soul, but the method of attaining this goal has been different between the two periods. The **Upanayan Sanskar** ceremony is so important during the Post-Vedic period that it is usually regarded a second birth of the individual.

The curriculum consisted of Vedas, History, Puranas, Grammar, mathematics, Brahma Vidya, Nirukti, astronomy, dance, music etc. Education is not regarded as an end in itself; it is fundamentally related to life. Its aim is to attain the **Brahmavarchasa** i.e. **knowledge of the absolute**. The performance of sacrifice and other ritualistic operations are directed to the same end, but special emphasis is laid on the study of the Scriptures, technically known as **Svadhyaya** or **Self- study**.

Hearing, thinking and meditation are the three principal psychological methods of instruction during the post-Vedic period. Also question-answer system is followed in the Upanishad literature; through this difficult and abstract ideas are made simple. During this period there are three types of institutions namely **Gurukulas, Parishads (Academies)** and **Sammelans (Conferences)**. The family functions as a domestic school, an ashram or a hermitage where the mental faculties of the pupil are developed by the teacher's constant attention and personal instruction.

Brahmanic Education

The aim of **Brahmanic education** is similar to the aim of Vedic education when the education is considered to be a means of gaining knowledge. In Vedic education too much emphasis has been laid on the religious aspect of education, but the Brahmanic education included worldly aspect as well. Self-reliance, self control, formation of character, individual development, knowledge of social and civil life and preservation of national culture are accompanied with the physical development as the aim of education.

Although Brahmanic system of education has many qualities to sustain life, yet it is not free from the defects. Since a good deal of importance is given to the Shastras in this system of education, everything based on them is correct and nothing else. Brahmanic system of education does not have the coordination in teaching of various subjects. Study of the subject in broad perspective or comprehensive study becomes lacking. Inspite of many defects, this system of education is more or less ideal and well planned and it does succeed in bringing about all round development of the personality of the students.

Education during Buddhist Era

Buddhist education aims at a personality transformation into a highest form of humanity through ethical, intellectual and spiritual perfection. These three faculties of perfection of human life undoubtedly lead a man through mundane happiness to supra mundane happiness, which is the highest achievement we all are equally looking for. The goal of Buddhist education is to attain wisdom. The main stress is given to have a clear idea of **Tripitaka which consists of Sutta Pitaka, Vinaya Pitaka and Abhidhamma Pitaka**. The entire Tripitaka consists of Buddhas teachings, message, philosophy and rules for the **Bhikkhus** and **Bhikkhunies**. In Sanskrit, the language of ancient India, the Buddhist wisdom is called **Anuttara-Samyak-Sambhodi** meaning the perfect ultimate wisdom. The main educational centers of Buddhism are **Monasteries and Viharas**. A network of such centers of education is started during the period. The entire educational system is controlled and supervised by the monks. The conditions of admission to the Sangha, or Community of Bhikhus are very simple. The first act of admission is called the **'Pabbajja'** or the **preparatory ordination** for education. According to this ceremony the students being admitted to a monastery has to renounce all his worldly and family relation. After this ordination, at the age of eight the boy would enter the monastery as a **'Shramana'.** Before admission to the order, the boy had to take oath of **'Three Refuges'**.

- Buddham Sharanam Gachchhami, (I take refuge with the Buddha)
- Dhararam Sharanam Gachchhami (I take refuge with the religion)
- Sangham Sharanam Gachhami (I take refuge with the order).

The ceremony for full admission is called the **Upasampada**. This final ordination could not be performed before the age of twenty years. The **'Upasampada'** is performed in the form of a function in the presence of all the monks of the order. On that occasion the novice is choosing his preceptor **'Upadhya'.**

The main subjects of Buddhist education are Spinning, Weaving, Printing of the cloth, Tailoring, Accountancy, Painting, Ayurveda

etc. The **Primary grade education** aimed at teaching 3 R's. (Reading, Writing, Arithmetic). But the **higher education** comprises of teaching in Religion, Philosophy, Medicine, Military Science, etc. for choosing different subjects. Caste distinction is not a bar. The following arts are taught in different institutions—Elephant lores, Magic charms, Spells, Hunting, Spell for understanding the cries of all the creatures, archery, the arts of Prognostication, Sarpa Vidya, Medicine etc. Students could specialise in any of these arts. The method of teaching is mainly oral. In viharas and monastic schools **Hetu, Vidya** or **Inductive method of logic** is adopted and through this method the intellect of the pupils is trained.

Education during Gupta Period

Education is given utmost importance during Gupta period. Holy places and capitals of kingdoms are the common **centers of learning**. Among the capitals, Pataliputra, Valabhi, Ujjain and Padmavati are famous centers of learning while **Ayodhya, Mathura, Nasik** and **Kanchi** are famous **centers of education**. In South India centers of learning are known as **Ghatikas**. There are two types of teachers- **'acharya'** and **'upadhya'**. The acharyas are entrusted with fundamental teachings of Vedas, Upanishads and Kalpasutra. The acharyas took their work as **'work of charity'** and refrained from taking fees from pupils. The Upadhyas took teaching as a profession and charged the pupils. For scholarly education, study of Dharmashastras, Smriti, itihasa-puranas and heterodox scriptures are included in the syllabus. For non-scholarly education, mathematics, science of warfare, astronomy, astrology and medicine are included. Education is generally permitted to the people belonging to the upper stratum of society. Brahmins are eligible for all types of education, while the Kshatriyas and Sudras are eligible only for some items of learning. But the Sudras are deprived completely from any light of education. Technical training included metallurgy, ivory and diamond cutting, woodwork. This is usually done in the family itself as professions had become hereditary.

Education during Mughal period

Mughal period is an important period in the history of India because of the developments in the field of art and languages, culture and religion. During the Muslim period, the education is meant to extend the knowledge and propagate Islam. The impartment of education took place with the **propagation of Islamic principles**, laws and social conventions. Education is based on religion and its main purpose is to make the individuals religious-minded. The Muslim education aimed at the achievement of material wealth and prosperity. The Mughal period made immense contribution in the system of education. During this period, the Mughal emperors acquired enormous understanding for learning and recognized the significance of education to a major extent. The scope of the curriculum is so widened as to enable every student to receive education according to his religion and views of life. The adoption of Persian as the court language gave further encouragement to the Hindus and the Muslims to study Persian.

Ancient Universities in India

- **Taxila or Takshashila University**
  i. Presently in Rawalpindi district of Pakistan.
  ii. Eligibility criteria is set as 16 years.

iii. Subjects taught are Vedas, Vedanta, Vyakaran, Ayurveda, Surgery, eighteen crafts (Sippas), Military Education including warfare and Archery, Astronomy, Agriculture, Commerce, Politics and more. It is the most famous centre for medicine.

iv. Taxila is very famous as a centre of training in Indian Military science, medicine.

v. Famous graduates of this University include the ones like Chanakya, Panini, Charaka, Vishnu Sharma, Jivaka etc.

vi. Taxila is known from the accounts of two Chinese Buddhist pilgrims, Faxian and Xuanzang.

- **Nalanda University**

i. Located in ancient kingdom of Magadha, presently in Rajgiha, Bihar.

ii. Gupta Emperor, Kumaragupta is considered as the founder.

iii. Eligibility criteria are set as 20 years of age.

iv. Students has to take an entrance exam for admission.

v. Subjects taught are Mahayana Buddhism, the Vedas, Logic, Medicine, astrology, asytonomy etc.

vi. University is destroyed by Bakhtiyar Khilji.

vii. In 2010, the parliament of India passed a bill approving the plans to restore the ancient Nalanda University as a modern Nalanda International University dedicated for post-graduate research.

viii. XuanZang, a chinese scholar carried back scriptures from Nalanda University and wrote about architecture and learning of this university.

- **Vikramashila University**

i. Vikramashila is known mainly through Tibetan sources, especially the writings of Tāranātha, the Tibetan monk historian of the 16th–17th centuries.

ii. Located at east of Bhagalpur in Bihar, Established by King Dharmapala.

iii. Subjects taught are Logic, Philosopy, Vyakaran, Tantra Shastra, Karamkanda and more.

iv. Tantra Shastra is the main subject taught there.

v. University is destroyed by Khilji.

- **Vallabhi University**

i. Established by the kings of Maitraka dynasty.

ii. Subjects taught are Economics, Law, Politics, Medical Science, Literature, Vyakaran and Hinayana Buddhism.

iii. University destroyed by Arabs.

- **Somapura University**

i. Established by King Dharmapala.

ii. Subjects taught are Hinduism, Buddhism and Jainism.

iii. Influence of the three traditions is still available in ornamental terracotta carvings.

- **Jagaddala University**

i. Established by pala king Rampala and located in Bangladesh.

ii. Subjects taught are Sanskrit, Vajrayana Buddhism.

iii. The Buddhist teacher Sakya Sri Bhadra entered Jagaddala for his studies. It is

said that his pupil Danaseela translated ten books to Tibetan Sakya Sri Bhadra is responsible for the propagation of Tatntric Buddhism in Tibet.

- **Odantapuri University**
  i. Located in Odantapuri, Bihar.
  ii. Subjects taught are ranged from the Vedic scriptures to Buddhism.
- **Pushpagiri University**
  i. Located in ancient Kalinga, present Odisha.

- **Mithila University**
  i. Prominent seat of Brahminical system of education.
  ii. Subjects taught are Literature, Fine arts, Vedas, Nyaya Shastra and more.
  iii. Two subjects gained prominence is Nyaya and Tarka Shastra.
  iv. Indian mathematician and philosopher Gangesha Upadhyaya founder a school of New Logic and wrote Tattva Chintamani.
  v. Students received degree after they cleared the Salaka- Pariksha (test)

- **Telhara University**
  i. Located at Telhara, Bihar.
  ii. Centre of Higher Research.
  iii. University is destroyed by Bakhtiyar Khilji.
- **Bikampur University**
  i. Established by King Dharmapala.
  ii. Special importance to Buddhist Education.
- **Nadia University**
  i. Formerly called as Navadweep, is set up after the destruction of Nalanda and Taxilla
  ii. Three centers are Navadweep, Shantipur, Gopaalpura.
  iii. Subjects taught are Logic, Vyakaran, Politics and Law.
  iv. The foundation of the Nadia school of Nyaya is connected with the great scholar Vasudeva Sarvabhauma.

Previous NET Questions (Self Evaluation)

1. The Ancient Indian University known as the chief centre for advanced and specialized studies in Nyaya or Logic is _____ (DEC- 2019)
   A. Jagaddala University
   B. Mithila University
   C. Nadia University
   D. Valabhi University
2. Which of the following modes of admission is prevalent in Nalanda University in ancient times? (D 2019)
   A. Entrance Examination
   B. Interview
   C. Good Academic Credentials
   D. Peer Discussion
3. Identifying the distinctive feature of traditional method of Indian education from the following list: (D 2019)
   A. Direct perception of truth – both as means and end
   B. Making everything on Trust
   C. Evolving own way of learning
   D. Following Nyaya Philosophy with deductive – Inductive process

4. Match the following historic places with their distinguishing discipline of learning (D 2019)

List – I	List II
Historic places	**Discipline**
1. Takshila	(i) Astronomy
2. Ujjain	(ii) Buddhism
3. Sarnath	(iii) Art, Architecture and Painting
4. Ajanta	(iv) Medicine

Choose the correct option from those give below:

A. a - (i), (b)-(ii), (c)-(iii), (d) – (iv)

B. a - (ii), (b)-(i), (c)-(iv), (d) – (iii)

C. a - (iii), (b)-(iv), (c)-(ii), (d) – (i)

D. a - (iv), (b)-(i), (c)-(ii), (d) – (iii)

5. Select the period in which India became a centre of higher learning (D 2019)

A. Gupta period B. Buddha period

C. Mughal period D. British period

6. In the age of four Vedas. students are admitted to the Vedic schools after performance ofwhich ceremony among the following? (D 2019)

A. Upanayana ceremony

B. Utsarjana ceremony

C. Satapathabrahmana

D. Dhanurvidya Ceremony

7. Who among the following scholars carried back scriptures from Nalanda University and wrote about architecture and learning of this university? (D 2019)

A. Kim Huang (Korea)

B. Jin Tan Yang (Korea)

C. XuanZang (China)

D. JunhaMeng(China)

8. In which of the following Ancient Indian universities, the culture and civilization of Tibet is built mainly through the writings of the scholars? (June 2019)

A. Nalanda

B. Vikramsila

C. Jagaddala

D. Mithila

9. In which era given below, higher education in India got a set back? (J 2019)

A. British Era

B. Buddhist Era

C. Mughal Era

D. Post-Independence Era

10. The purpose of Gurukul system of education is to: (J 2019)

A. Promote equality and excellence

B. Minimise stress in learning

C. Empowering for future learning

D. Encourage self-help

Answer Key

1	2	3	4	5	6	7	8	9	10
B	A	A	D	A	A	C	B	C	A

EVOLUTION OF HIGHER LEARNING AND RESEARCH IN POST INDEPENDENCE INDIA

India's higher education system is the third largest in the world, next to the United States and China. The main governing body at the tertiary level is the University Grants Commission, which enforces its standards, advises the government, and helps coordinate between the centre and the state; accreditation for higher learning is overseen by 15 autonomous institutions established by the University Grants Commission (UGC), until National policy of Education 2020, is Introduced. Thereafter structural reorganisation took place in higher education sector which we would read in detail in the following module.

The educational situation on the eve of independence is quite bleak. In spite of all that has been achieved under the British Rule, we begin our freedom on a fairly low level of attainment in education in almost all respects. There are 17universities and 636 colleges, 5,297secondary schools with 8,70,000 pupils (which implied that not even one youth in every twenty in the age-group 14-17 is in school), 12,843 middle schools with two million pupils (which meant that only one child out of every eleven in the age-group 11-14 is enrolled) and 1,72,661 primary schools with fourteen (which implied that only one child out of every three in the age-group 6-11 is in school). Vocational and technical education is poorly developed, both at the school and university stages, and the supply of high level trained scientific man-power is very limited. Various Commissions of Education has been established for the purpose of enhancing the education for the Indian community. The commissions have given their respective perceptions of educational and various contributions in the field.

Educational reforms during British Period:

Development of education system during the British period is determined by the needs of the colonial powers. The modern system of education has come to be established in India during the British period at the cost of the traditional indigenous system. Before the British established a new system of education in India both the Hindus and the Muslims had their own systems of education. The development of modern system of education in India may be said to have begun with the Charter Act of 1813.

The Charter Act 1813

The charter Act or East India Company Act is passed by the British parliament. This Act is the **first legislative recognition** of the right for education. By this act the education of the Indian people is included within the duties of the Company. The company is also to take up a greater role in the education by allocating **Rs.1 Lakh**. **Section 43** of the Charter Act 1813 has only defined the objects of the educational policy, viz. **'the revival and improvement of literature', 'the encouragement of learned natives of India'** and **'the introduction and promotion of a knowledge of sciences among the inhabitants of the British territories in India'**; but it has no directions regarding the methods to be employed to secure these objects. Although it is the first act through which the education system has formally laid down in India, yet it has created a controversy between the Anglicist and classicist on the medium of instruction. The Charter Act has given stress on allotting the one lakhs rupees only; no specific regulations are granted for establishing the schools and colleges in India.

Macaulay's Minute 1835 or English Education Act

Lord Macaulay arrives in India on June 1834, as the **President of the General Committee of Public Instruction (GCPI)**. Macaulay is a proud Englishman convinced of his own nation's

greatness and achievements, which he considers the best whether it is in the sciences or the arts. He lampoons Indian knowledge and languages and thought them completely worthless. For instance, he said of Indian literature: "…a single shelf of a good European library is worth the whole native literature of India and Arabia." Lord William Bentinck, then Governor-General of British India, to reallocate the funds the allocated by the Charter Act 1813, and to entrust the dispute between the orientalists and Anglicists, appoints Lord Macaulay.

In the Minute Macaulay says:

a. All funds appropriated for the purpose of education would be best employed on English education alone.

b. The Government Funds are not to be spent on the printing of oriental works.

c. All the funds at the disposal of the Government would be spent in imparting to the Indians on their knowledge of English literature and Science.

Thus English became the medium of instruction. Downward Filtration theory of education emerged.

Downward Filtration Theory of Education

The British rulers thought that in order to run the administration peacefully and smoothly it is essential to make the higher classes' blind followers of the Britishers. This they wanted to achieve through educating the upper classes. This theory meant education is to be filtered to the common people. The Britishers adopted this theory because the **British rulers needed various types of employees to run the business and the government**. The government does not have sufficient funds for educating the masses. Higher classes educated through the medium of English would adopt English ways and in turn influence the lower classes. After educating some people, the responsibility of educating the masses could be left to them.

Wood's Despatch 1854

Sir Charles Wood, the President of the Board of Control, has an important effect on spreading English learning and female education in India. In 1854, Charles Wood prepared a despatch on an educational system for India. This document is considered as the **"Magna Carta of English Education in India"**. The diffusion of European Knowledge is the primary object of Wood's Despatch. This Despatch marked the beginning of Mass Education which is a departure from the Filtration Theory.

The major recommendations of Wood's Despatch are:

a. Primary schools must adopt vernacular languages, high schools must adopt Anglo-vernacular language and at college-level English should be the medium of education.

b. Expansion of mass education through vernacular language.

c. The establishment of university at the presidencies of Calcutta, Bombay and Madras in 1857. The universities are to be modeled after the London University and these are to have a **senate comprising of a Chancellor, a Vice-Chancellor**, and fellows who are to be nominated by the Government.

d. The sanction of a grant-in-aid system in the Indian educational system. To educate the large number of people of India is a difficult task and so the grant-in-aid system is adopted by the government. The grant-in-aid is used to encourage private enterprise.

e. It stressed on female education and encouraged the private enterprises to promote women education. The schools for girls are to be included among those to which grants-in-aid would be given.

f. The establishment of teacher training school in every province. There should be training schools for teachers of engineering, medicine and law.

g. It recommends the establishment of medical, engineering, law and other institutes of professional education. The reason for the encouragement of vocational education is to control the problem of unemployment.

h. The Indian natives should be given training in their mother tongue also.

Hunter Commission- 1882 or Indian Education Commission

Lord Ripon the Governor-General of India appointed the first Indian Education Commission on **February 3, 1882** under the Chairmanship of Sir William Hunter, a member of the Executive Council of Viceroy. The commission is appointed to **review the progress made in the field of education by Charles Wood's Declaration**. The commission is restricted to the review of primary education and secondary education. The commission is appointed:

a. To assess the position of primary education in India and to suggest measures for its reform.

b. To enquire into the position of the State institutions and their importance.

c. To evaluate the work of missionaries in the field of education.

d. To enquire into Government attitude towards private enterprise.

The recommendations of the commission include:

a. Primary education should be regarded as education of the masses.

b. Education should be able to train the people for self-dependence.

c. Medium of Instruction in primary education should be the mother tongue.

d. English should remain as medium of instruction in the Secondary stage.

e. Appointment of teachers should be made by the district authority and approved by the government.

f. Curriculum should include useful subjects like agriculture, elements of natural and physical science and the native method of arithmetic and measurement etc.

g. Spread of primary education for the tribal and backward people should be the responsibility of the Government.

Indian University Commission- 1902

In accordance with the education policy enunciated at Simla Conference, Lord Curzon appointed Indian University Commission in 1902. The Commission is led by Law member Sir Thomas Raleigh. The major recommendations of the commission are:

a. More new universities should be established, and the prevailing universities should be reorganized.

b. The system of senate and syndicate of universities should be reorganized that the senate should have the members between 50 and 100.

c. Affiliated colleges should be strictly supervised by the Universities.

d. Proper amendments should be made in the curriculum and the examination system of the Universities.

e. Proper equipment of libraries and laboratories should be maintained.

f. The universities should also function as teaching universities.

Indian Universities Act, 1904:

Based on the recommendations of Indian University Commission- 1902 the Indian Universities Act is passed in 1904. The main objective of the Act is to improve the condition of education in India and upgrade the system to a better level. The provisions of the Act include:

a. Universities are given the right of teaching along with the right of conducting examination.

b. The Indian Universities Act, 1904 introduced the principle of election in the constitution of the Senate.

c. Rules pertaining to affiliation of Colleges to a University are made stricter.

d. After the implementation of the provisions of University Act, though the number of colleges declined, yet the number of students increased considerably.

Government Resolution on Education policy, 1913

The demand for compulsory primary education is strengthened by the fact that the Maharaja Sayaji Rao Gaikwad of Boroda has made primary education free and compulsory within the territories of his state. This attempt inspired Gokhale. It deals with Gokhale's attempt to introduce compulsory primary education in India, its impact and the Government of India Resolution of 1913.

The important points of the resolution:

a. Primary education should be made free and compulsory in the area where 35% of boys are receiving education. This provision should apply to the age group of 6-10 years.

b. The Resolution provided for the expansion of university education. The existence of 5 universities and 185 Colleges is considered to be insufficient in view of the vast needs and demands of the country.

c. Emphasis is laid on the education of woman too. Suggestion are put forth concerning special curriculum of practical utility for girls and it is also suggests that too much importance should not be attached to examination in the examination of girls. Number of women teachers and inspectors should be increased.

Saddler University Commission, 1917

The outbreak of the First World War (1914-1919) however, delayed the development planned in the resolution as the Government had to concentrate its attention and energy over the war. After the war is over, the Government appointed the Calcutta University Commission in 1917 mainly to look into the affairs of Calcutta University, yet in its report it deals with different aspects of education. The commission is also known as the Sadler Commission after the name of its chairman Dr. Michael E. Sadler, the Vice Chancellor of the University of Leeds. The commission is mainly constructed with the express motto **"to enquire into the condition and prospects of the University of Calcutta and to consider the question of a constructive policy in relation to the question it presents".**

The recommendations are:

a. The School course is to be for twelve years.

b. After Matriculation, student has to pass an Intermediate examination from the Intermediate College, which would provide for instruction in Arts, Science, Medicine, Engineering and Teaching etc.

c. The dividing line between the University and Secondary courses should properly be drawn at the Intermediate examination than at the Matriculation Examination.

d. The duration of degree course should be limited to three years.

e. Autonomous institutions should be given more encouragement.

f. Centralised residential-teaching universities should be encouraged. These institutions should be given autonomy to facilitate their day-to-day working.

g. The establishment of a **special Board of women Education in the Calcutta University** besides many other facilities that would help more and more women take up course in school, colleges and Universities.

h. Provisions of facilities are to be made for **training teachers and setting up the Department of Education at the Universities of Calcutta and Decca**.

Hartog Committee, 1929

Sir Philip Joseph Hartog is a British chemist and educationalist who undertook this role in England and India. Sir Philip Hartog has served under the Sadler Commission and has also been a vice chancellor of Dacca University in 1921. This Committee is appointed to survey the growth of education in British India. It "devoted far more attention to mass education than Secondary and University Education". The report pointed out that many universities are only conducting the examinations and only in some universities teaching and research work had begun. There is a lack of good libraries in the universities.

The recommendations are:

a. The committee recommended the establishment of affiliated universities along with the unitary, residential and teaching universities, keeping in view the great demand for higher education in India.

b. The teachers for affiliated colleges should be appointed by the universities. This procedure will raise the standards of education.

c. The honours course should be of more advanced nature than the pass courses and these courses should be instituted only at the universities.

d. Provision should be made for technical education by the universities. Graduates should not suffer from unemployment and Employment Bureau should be opened in the universities to help the students get suitable employment.

e. The admission in the universities should be made on the basis of abilities and aptitudes of students.

f. There should be a well equipped central library in each university in order to enable the teachers to keep themselves upto date in the field of education.

Sapru Committee, 1934

The Sapru Committee is appointed in 1934 by the Uttar Pradesh Government. It enquired into the **causes of unemployment in Uttar Pradesh**. The committee concluded that "much of the unrest is primarily due to mass unemployment and that the system of education prepared the students only for examinations and degrees and not for life.

The recommendations are:

a. Diversified courses at the secondary stage should be introduced, one of these leading to the University degree

b. The intermediate stage be abolished and the secondary stage be extended by one year.

c. The vocational training and education should begin after the lower secondary stage.

d. The Degree course at the University should extend over a period of three years.

The Abbot-Wood Report, 1936

The Government of India invited in 1936-37 two British experts to come India and prepare a plan for vocational education in the country. These two experts are **A. Abott** and **S.H. Wood**. These two persons toured in Punjab, Delhi and U.P and prepared a report on vocational education within four months. The Abbot-Wood Report, submitted in 1937, suggested a complete hierarchy of vocational institutions parallel with the hierarchy of institutions imparting general education. As a result of their recommendations **"a new type of technical institution called the Polytechnic has come into existence"**.

Some of the recommendations are:

a. Vocational education should be organized according to the needs of various vocational areas.

b. Vocational education should be considered at same level with literary and science education and its standard should be raised.

c. Skilful workers engaged in small industries should also be given proper vocational training.

d. Vocational Education Advisors' Council should be established for developing healthy relationship between vocational education and various vocations.

e. There should be two types of schools for vocational education. The first should be the junior vocational school and the second senior vocational school. In the junior school after class VIII there should be three years' course for vocational education. In the senior there should be two years' vocational educations after the class XI.

f. Part-time classes should be opened for persons engaged in various vocations.

g. The Government should open vocational institutions in big cities and big vocational centres.

Zakir Hussain Committee -1937 or Wardha scheme of education

The committee is appointed by **All India National Education Conference**. The intention of the committee is to formulate a scheme of basic education proposed by Wardha conference under the guidance of Mahatma Gandhi. Wardha Scheme of Basic Education (1937) which is also known as Nai Talim / Buniyadi Talim is the outcome of thinking of Mahatma Gandhi. He considered education as an effective instrument of national reconstruction. A committee is appointed under the chairmanship of Dr. Zakir Hussain to formulate the scheme of basic education in India.

The recommendations are:

a. Free and compulsory education is to be given for 8 years (from 6 to 14 years).

b. The idea behind the scheme is to provide education through some form of craft or productive work.

c. It aims at Self-supporting education.

d. It proposed that proper teaching in the mother tongue should be the foundation of all education.

e. It aimed at providing the citizens of future an opportunity of personal growth, dignity, and efficiency in a cooperative community.

f. It provides a flexible curriculum; the students and teachers are free to work according to their interest and requirement. English is not included in the curriculum. However, it is mandatory to learn the Hindi language.

Sargent Committee, 1944

The committee is appointed by the **Central Advisory Board of Education (CABE)** towards the end of the World War - II, for the idea of renovation of educational prospects in India. Sir John Sargent, the Educational Adviser to the Government of India is asked to prepare a comprehensive report on education. The report of the committee is submitted to the Central Advisory Board of Education (CABE) in 1944. It is also known as 'Report by the Central Advisory Board of Education' and also as the plan for post-war educational reconstruction in India.

The recommendations are:

a. The degree course of University education should be made for 3 years. The commission recommends abolishing the intermediate course.

b. It recommends raising the standard of education in universities and allowing only capable students to take University education.

c. To promote cooperation among the universities there is a proposal to **set up all India organisation similar to the University Grants committee of England**.

d. For the lower category workers, the committee recommended for the provision of Training and Technical High schools for the diploma or certificate courses.

e. To ensure sound health of school children, the sargent education report recommended for medical checkups of every average student.

f. Sargent education report recommended for training colleges, and training Institutions to provide well trained teachers.

What is CABE (Central Advisory Board of Education)?

The Central Advisory Board of Education is the oldest and the most important advisory body of the Government of India in education. The idea to have a central Advisory Board of Education is first put forward by the **Calcutta University Commission**. The purpose of the board is to "perform an invaluable function by defining the general aims of educational policy, by giving advice and assistance to local governments and to the development of educational ideas in the various provinces, and also elsewhere than in India." Thus a **Central Advisory Board of Education is set up in 1920** under the chairmanship of Education Commissioner to the Government of India. But, owing to a financial crisis calling for drastic retrenchments, the board is abolished in 1923. After the Report of Hartog Committee (1929) which observed that the divorce between the Government of India and education had been unfortunate, the present **Central Advisory Board of Education is revived in 1935** and had continued to exist till 1994, and then the CABE has been **reconstituted by the Government in July 2004**.

The main function of the board is to advice central and state government in the field of education.

It should review the progress of education in the country from time to time.

The organizational structure includes chairman, vice chairman, and representatives from the central and state government, parliament representatives; two from Rajya Sabha and four from Lok Sabha etc...

According to NPE 2020, Central Advisory Board of Education (CABE) which will have a much greater mandate and not only a forum for widespread consultation and examination of issues relating to educational and cultural development. The remodeled and rejuvenated CABE shall also be responsible for developing, articulating, evaluating, and revising the vision of education in the country on a continuous basis, in close collaboration with MHRD and the corresponding apex bodies of States. It shall also create and continuously review the institutional frameworks that shall help attain the vision of NPE 2020.

Educational Commissions after Independence

Radhakrishnan Commission 1948 or University Education Commission:

The first committee for the most important education in independent India is the University Education Committee of 1948. **The commission is appointed by the government of India on the recommendation of Central Advisory Board of Education and Inter-University Board**. Sarvepalli Radhakrishnan is one of the most recognized and an influential Indian thinker in academic circles in the 20th century is appointed as the chairman of the commission. The Radhakrishnan Commission is appointed with the specific aim 'to report on Indian University Education and suggest improvements and extensions that may be desirable to suit present and future requirements of the country'.

The recommendations are:

a. The university grants commission **(UGC)** should be set up for allocation of grants to Universities.

b. The organizational set up of a university should be followed as: The Visitor, The Chancellor, The Vice- Chancellor, The Senate (Court), The Executive Council (Syndicate), The Academic Council, The Faculties, The Board of Studies, The Finance Committee, The Selection Committee.

c. The aim of university education should be to produce citizens who can take up national responsibilities successfully in various fields.

d. The aim of a university should be to maintain a high standard in general, professional and vocational education by inspiring the students to search for a new knowledge and good effort that must be authentic in nature.

e. The university has to instil moral values in the students while making them well disciplined.

f. The university has to develop the spirit of universal brotherhood and internationalism in the students.

g. The universities have to provide leadership in politics, administration, education, industry and commerce.

h. One of the main functions of universities is to bring about the spiritual development of students.

i. Education should discover the innate qualities of a person and develop them through training.

j. It recommended that proper care should be taken in the selection procedure of a teacher for the appointment as a professor, reader, lecturer and an instructor as well as for his or her salaries.

k. The standard of admission to the university courses should correspond to that of the present intermediate examination, i.e. after the completion of 12 years of study at a school and an intermediate college.

l. It emphasis that agriculture education should be recognized as an important national issue and the study of the subject of agriculture should be introduced in all stages of education i.e. primary, secondary and higher level.

m. Commercial education should be made more practical and the graduates should be encouraged to specialize in a particular branch.

n. Higher education should be imparted through the regional language with the option to use the federal language as the medium of instruction. English should be studied in the Higher Schools and in the Universities for keeping the students in touch with the living stream of ever-growing knowledge.

o. The Commission suggested for providing the same facilities to the women colleges and universities as provided to men's colleges and universities.

Secondary Education Commission or Mudaliar Commission, 1952

The Secondary Education Commission is appointed under the chairmanship of Dr. L.S. Mudaliar on September 23, 1952. So, it is popularly known as Mudaliar Commission. The commission has pointed out some defects of the existing system of secondary education. The commission gave important recommendations with regard to the aims of secondary education and the principles of curriculum construction.

The recommendations are:

a. Three languages should be taught in the schools. The medium of instruction at the secondary stage should be either the mother tongue or the regional language. English and Hindi are compulsory.

b. The Commission has recommended that the secondary education should be for children between **11 to 17 years of age**.

c. The Commission has recommended the introduction of three years' degree course. For this secondary education should continue up to the eleventh class and the twelfth class should be added to the first degree course (B.A., B.Sc. or B.Com.) of the university.

d. Agriculture should be made a compulsory subject for schools in villages.

e. In big cities **'technical area'** should be established on the demands of the local public.

f. Home science should be made compulsory for girls and other subjects should be common for both boys and girls.

g. The curriculum should be recognized according to the interests of the students. It should be determined for meeting the social aspirations. It should be reorganized keeping in view the demands of the times and those of the country.

h. The students should be evaluated on 5 points: **A-distinction, B-credit, C-pass, D and E-fail or re-exam**.

Durgabai Deshmukh committee or National Committee on Women's Education, 1958:

National Committee on Women's Education is set up by the government by in 1958. The chairperson is Durgabai Deshmukh who is a follower of Mahatma Gandhi and participated in the Salt Satyagraha.

The recommendations are:

a. The highest priority should be given to establishing parity between the education of boys and girls, and a bold and determined effort should be made by the government to face the difficulties and magnitude of the problem.

b. It recommends co-education upto middle school but separate institutions for girls at the high school stage, where more diversified curriculum suited to girls.

c. It recommends adequate provisions for mothers, training of women teachers and employment facilities for adult women.

The Planning Commission 1960.

The commission originated from the inspiration of Shri. Jawaharlal Nehru with the focus on national development. To attain the purpose, the commission formulated and implemented Five-Year plans.

The commission has given the responsibility of assessing all the resources of the country, determining priorities and making effective use of resources. Also various educational programs such as 'Sarva Shiksha Abhiyan', Adult Education, vocational education, teacher's education, Science education, Physical Education, language development, cultural activities were organized at the initiation of the commission.

Kothari Education Commission or National Education Commission, 1964:

National Education Commission is set up by the government of India in 1964, under the chairmanship of Dr. Daulat Singh Kothari. The objective of the Kothari Education Commission is to examine the different aspects of the education system in India. The commission submitted its report in 1966. The recommendations of the Kothari commission education reforms become part of national policy on education in 1968.

The recommendations are:

a. The committee highlighted the advantages of a uniform educational structure throughout the country. **10 + 2 + 3 is to be the pattern of educational structure in the country**.

b. The commission highlighted the need to increase the investment in education to reach a level of 6% of national income expenditure on education.

c. The need for coordination between the states and the central government is also necessary for the development of education.

d. It aimed to increase enrolment in schools to attend the desirable goal of free and compulsory education.

e. It recommended adequate and satisfactory service conditions for the Teachers along with proper qualifications and responsibilities.

f. It recommended for academic freedom to teachers to allow them to publish independent studies and researches.

g. It intended to promote a modern Indian language, which is preferably to be any Southern language apart from Hindi and English.

h. It recognized the importance of Sanskrit in the growth and development of Indian languages and its contribution to the cultural unity of the country.

i. The commission recognized the need for the provision of Laboratories, libraries, sufficient strength of teachers and other staff as the parameter to decide the number of students to be admitted to a college or university. It recommends the approach of clusters of centers to promote Research and training.

The National Policy of Education 1968:

The National Policy of Education 1968 is based on the recommendations of National Education Commission, 1964 by the government of Prime Minister Indira Gandhi. The Commission recommended that the Government of India should issue a statement on the National Policy on Education which should provide guidance to the state Governments and the local authorities in preparing and implementing educational plans. The policy is called for a **"radical restructuring" and equalise educational opportunities in order to achieve national integration and greater cultural and economic development**. It emphasized that education needs to be managed in an atmosphere of Utmost intellectual rigour seriousness of purpose and of freedom essential for innovation and creativity. **It aims fulfill compulsory education for all children up to the age of 14**, as stipulated by the Constitution of India, and the better training and qualification of teachers.

The National Policy of Education 1986:

The National Policy of Education of 1986 is the result of the reviews which is discussed and adopted during the budget session of1985 when Rajiv Gandhi is the prime minister of India. The main objective of the National Policy of Education of 1986 is to establish a national system of education implies that all students irrespective of caste; creed, sex, and religion have access to education of a comparable quality.

Salient features of the policy:

a. Education develops man-power for different levels of national economy.

b. It envisages a common educational structure i.e. 10 + 2 + 3 which is recommended by Kothari Commission. This structure has now been accepted in all parts of the country.

c. The national system of education will be based on a national curricular framework which contains a common core along with other components that are flexible.

d. In the areas of research and development and education in science and technology, special measures will be taken to establish network arrangement between different institutions in the country' to pool their resources and participate in projects of national importance.

e. Women's studies will be promoted as a part of various courses and educational institutions will be encouraged to take up active programmes to accelerate the pace of women's development.

f. The construction of school buildings should be undertaken in tribal areas on a priority basis under the normal funds for education, as well as under the NREP, RLEGP and Tribal Welfare Schemes.

g. Vocational education should be a distant stream which intends to prepare children for different occupations across various areas of activity.

h. Autonomous colleges should be developed in large numbers.

i. The **Open University system** should be initiated in order to augment opportunities for higher education and an instrument of democratizing education.

j. Value education should lay on profound positive content, based on our heritage, national goals and universal.

k. Efforts are made to introduce Yoga in all schools and teacher training courses. Indigenous traditional games will be emphasized.

Ramamurti Review Committee (1990)

The government decided to review the National Educational policy of 1986 and appointed a committee under the chairmanship of Acharya Ramamurti. The Committee for Review is popularly known as Ramamurti Review Committee.

The major recommendations:

a. Development of a common school system: a very vital component for securing equity and social justice in education is the functioning of a common school system.

b. Removing disparities in education in terms 1of disintegrated targets, area, and community and gender specific activities.

c. Promotion of women education: in order to promote participation of the girls and women in education at all levels.

d. Value education is to be conceived as a continuous process. Value education should ensure that education does not alienate the students from the family, community and life.

e. Right to Education should be examined for inclusion among the fundamental rights.

f. The state governments should develop all decision making power concerning operation black board for planning and implementing the scheme.

g. No further Navodaya Vidyalaya need be opened. The Navodaya Vidyalaya scheme may be transformed into a Navodaya Vidyalaya programme of broad based talent nurturing and pace setting (A day school each under the Common School system can function in the premises of Navodaya Vidyalayas).

h. All technical and professional education should be made self financing.

Janardhana Reddy Committee (1992)

The Central Advisory Board of Education (CABE) appointed the Janardhana Reddy Committee under the chairmanship of Sri. Janardhana Reddy. The purpose of the committee is to review the implementation of the various parameters of NPE taking into consideration the report of the Ramamurti Review Committee.

The major recommendations:

a. Effective measures need to be taken to implement the provision of NPE in regard to common school system.

b. Navodaya Vidyalaya should be set up in each district as originally envisaged.

c. The Anganwadi workers should play an expanded role for a number of activities and support services for women and children, such as child care, family welfare, nutrition and health.

d. The existing vocational stream at the +2 level may be suitably strengthened and, wherever possible, the vocational courses may be started from class ix also.

The National Policy of Education 1992:

The 1986 National Policy of Education is modified by the P.V. Narasimha Rao government and Prime Minister Manmohan Singh has adopted it in 2005 which is recognized as **"Common Minimum Programme".**

The major recommendations:

a. All India bases common entrance examination for admission in all professional and technical programmes in the country.

b. It emphasized on the importance of technology and formulated policy regarding the utilizations of computer education in our country.

c. It recommends increasing individual competency and national productivity.

d. It emphasized that teacher training facilities should be provided to eligible candidates in the teaching profession.

National Knowledge Commission, 2005

The National Knowledge Commission (NKC) is constituted in June 2005 by the Prime Minister Dr. Manmohan Singh, under the Chairmanship of Mr. Sam Pitroda. In the words of Prime Minister Dr. Manmohan Singh **"The time has come to create a second wave of institution building and of excellence in the field of education, research and capability building so that we are better prepared for the 21st century."** The purpose of the commission is to prepare a blueprint for reform of our knowledge related institutions and infrastructure which would enable India to meet the challenges of the future.

The major recommendations:

a. Build excellence in the educational system to meet the knowledge challenges of the 21st century and increase India's competitive advantage in fields of knowledge.

b. Promote creation of knowledge in S&T laboratories.

c. Improve the management of institutions engaged in intellectual property rights.

d. Promote knowledge applications in agriculture and industry.

e. Promote the use of knowledge capabilities in making government an effective, transparent and accountable service provider to the citizen and promote widespread sharing of knowledge to maximize public benefit.

f. Leverage information and communication technologies to enhance governance and improve connectivity.

g. Build a national knowledge network to connect 5000 nodes across institutions

h. It recommends establishing 1500 universities to increase the enrolment of students in the institutions of higher learning.

Yashpal Committee, 2009

The Ministry of Human Resource Development (MHRD) has set up a Committee on Higher Education known as the Committee to Advise on Renovation and Rejuvenation of Higher Education under the chairmanship of Dr. Yashpal. The committee is constituted for examining reforms to be brought about in higher education in India. In its report, the Yashpal Committee laid emphasis on the idea of a university and advocated a number of major structural changes.

The major recommendations:

a. It recommends that the deemed university status should be abandoned.

b. It has recommended protecting the intellectual autonomy of educational institutions and the creation of an all-encompassing National Commission for Higher Education and Research (NCHER) to replace or subsume the existing regulatory bodies.

c. It also recommended that all the deserving deemed universities should be either converted to full-fledged universities or would have to be scrapped

d. The committee recommended that bodies like the NCTE, AICTE, UGC and others must be replaced by a Commission for Higher Education and Research (CHER) – a seven-member body.

e. It recommended that the universities must take up all the academic responsibilities, restricting the jurisdiction of the other regulators such as the Bar Council of India, the Medical Council of India, etc. to administrative matters alone.

f. The report said that IITs and IIMs should be encouraged to diversify and expand their scope to work as full-fledged universities.

g. There is also another committee named Yashpal Committee in the year 1993 for school education. In 1993, the Ministry of Human Resource Development (MHRD), Government of India, had set up a National Advisory Committee, with Yashpal as chairman, to go into the issue of overburdening of school children. The report of the committee is named as Learning without Burden. The objective of the committee is to advise on the ways and means to reduce the load on school students at all levels particularly the young students, while improving quality of learning including capability for life-long self-learning and skill formulation.

Previous NET Questions (Self Evaluation)

1. Which one of the following has been the basis for introduction of yoga in teacher training courses? (Dec 2019)

   A. National Policy of Education – 1968

   B. National Policy of Education – 1986

   C. Vision of Teacher Education in India Quality and Regulatory Perspective – 2012

   D. Draft National Education Policy – 2019

2. Which of the following emphasized that education needs to be managed in an atmosphere of Utmost intellectual rigour seriousness of purpose and of freedom essential for innovation and creativity? (Dec 2019)

   A. National policy of Education – 1968

   B. National policy on Education – 1986

   C. NITI Aayog- Three Year Action Agenda (2017 - 18 to 2019 -20)

   D. Draft National Education Policy – 2019

3. Who among the following first took the initiative for appointing a University Education Commission during pre – independence period? (Dec 2019)

   A. Lord Curzon

   B. Lord Ripon

   C. Lord Wellesley

   D. Lord Bentick

4. Which one of the following groups of commission on education has been given chronologically in an order of year in which they are constituted? (Dec 2019)

   A. Kothari commission, Mudaliar Commission, Kothari Commission

   B. Radhakrishnan Commission, Mudaliar Commission, Kothari Commission

   C. Mudaliar Commission, Kothari commission, Radharkishnan Commission

   D. Radhakrishnan Commission, Kothari Commission, Mudaliar Commission

5. Which among the following recommended the establishment of State Council for Higher Education in each state? (Dec 2019)

   A. Report of the Estimates Committee (1965 – 66)

   B. Review Committee on UGC (1977), Ministry of Education

   C. National policy on Education (1986)

D. Report of the UGC Committee (1990)

6. In post-independence India, which one of the following committee/commission's report deals with all levels of education in India? (June 2019)
   A. Sargeant commission
   B. Hartog committee
   C. Kothari commission
   D. Radhakrishnan commission

7. The report of which of the following Education Commissions carries the sub-title 'Education for National Development'? (June 2019)
   A. Radhakrishnan Commission
   B. Mudaliar Commission
   C. Calcutta University Education Commission
   D. Kothari Commission

8. On the Recommendation of which Commission 10 + 2 + 3 structure is incorporated in the statement of national policy on education, 1968 (June 2019)
   A. Mudaliar Commission
   B. Rama Murti Commission
   C. Mandal Commission
   D. Kothari Commission

9. In 1948, under whose Chairmanship a University Education Commission is set up to reconstruct University Education in India ? (DEC 2018)
   A. Prof. P.C. Joshi
   B. Sardar Vallabh Bhai Patel
   C. Dr. S. Radhakrishnan
   D. Dr. Vikram Sarabhai

10. In which year Secondary Education Commission is appointed under the chairmanship of Dr. A.L Mudaliar? (DEC 2018)
    A. 1950 B. 1951
    C. 1952 D. 1962

11. In which year Education Commission under the Chairmanship of Dr. D.S. Kothari is set up? (DEC 2018)
    A. 1964 B. 1960
    C. 1952 D. 1955

12. The National Knowledge Commission (NKC) is established in which year? (DEC 2018)
    A. 2005 B. 2000
    C. 1998 D. 2007

13. To improve access and quality in higher education, the Knowledge Commission recommendations include which of the following? (DEC 2018)
    i) Use of ICT for production of knowledge
    ii) Closure of non-performing Universities in the country
    iii) Establishment of a network of institutions of higher learning
    iv) Increase in the enrolment of students in the institutions of higher learning
    A. i, ii, iii only
    B. All the above
    C. I, ii, iv only
    D. i, iii, iv only

Answer Key

1	2	3	4	5	6	7	8	9	10
B	A	A	B	C	C	D	D	C	C

11	12	13
A	A	D

NATIONAL EDUCATION POLICY 2020

A Foreword

The Union Cabinet chaired by the **Prime Minister Shri Narendra Modi** approved the National Education Policy 2020, making way for large scale, transformational reforms in both school and higher education sectors. This is the **first education policy of the 21 century and replaces the thirty-four year old National Policy on Education (NPE), 1986.** However the very first policy for education was promulgated in 1968 with the second one following in 1986.

Built on the foundational pillars of Access, Equity, Quality, Affordability and Accountability, this policy is aligned to the **2030 Agenda for Sustainable Development** and aims to transform India into a vibrant knowledge society and global knowledge superpower by making both school and college education more holistic, flexible, multidisciplinary, suited to 21 century needs and aimed at bringing out the unique capabilities of each student.

Backdrop Information

The MHRD initiated an unprecedented collaborative, inclusive, and highly participatory consultation process from January 2015. In May 2016, 'Committee for Evolution of the New Education Policy' under the Chairmanship of Late Shri **T.S.R. Subramanian**, Former Cabinet Secretary, submitted its report. Based on this, the Ministry prepared 'Some Inputs for the Draft National Education Policy, 2016'.

In June 2017 a 'Committee for the Draft National Education Policy' was constituted under the **Chairmanship of eminent scientist Padma Vibhushan, Dr. K. Kasturirangan,** which submitted the Draft National Education Policy, 2019 to the Hon'ble Human Resource Development Minister.

The implementation of previous policies on education has focused largely on issues of **access and equity**. The unfinished agenda of the National Policy on Education 1986, modified in 1992(NPE 1986/92), is appropriately dealt with in this Policy. A major development since the last Policy of 1986/92 has been the Right of Children to Free and Compulsory Education Act 2009 which laid down legal underpinnings for achieving universal elementary education.

Fundamental Principles of NPE, 2020

The aim must be for India to have an education system by 2040 that is second to none, with equitable access to the highest-quality education for all learners regardless of social or economic background.

- To achieving Foundational Literacy and Numeracy by all students by Grade 3;
- Flexibility in Learning - No hard separations
- Multidisciplinarity and a holistic education
- Emphasis on conceptual understanding
- Creativity and critical thinking
- Ethics and human & Constitutional values
- Promoting multilingualism and the power of language in teaching and learning;
- Life skills such as communication, cooperation, teamwork, and resilience;
- Focus on regular formative assessment for learning
- Extensive use of technology, increasing access for Divyang students (Differently abled or specially abled students)
- Respect for diversity and respect for the local context
- Full equity and inclusion
- Synergy in curriculum across all levels of education

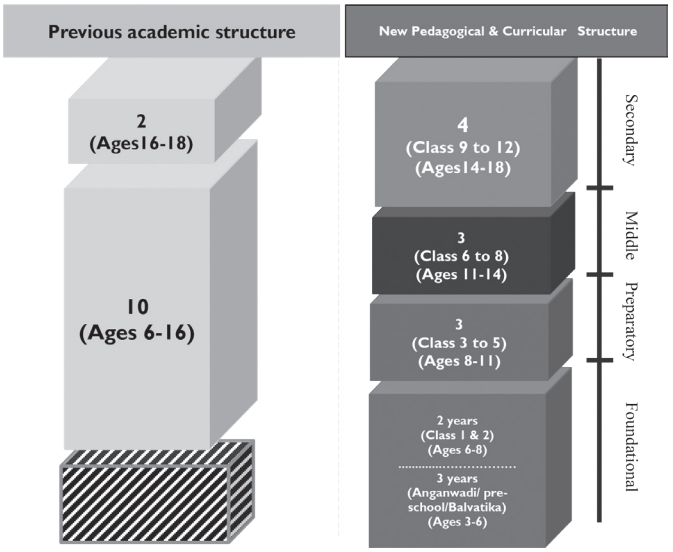
- Teachers and faculty as the heart of the learning process
- 'Light but tight' regulatory framework to ensure integrity, transparency, and resource efficiency
- Outstanding research as a co requisite for outstanding education and development;
- Continuous review of progress based on sustained research and regular assessment
- Rootedness and pride in India
- Education is a public service (right of every child)
- Substantial investment in a strong, vibrant public education system

Vision of the Policy

The vision of the Policy is to instill among the learners a deep-rooted pride in being Indian, not only in thought, but also in spirit, intellect, and deeds, as well as to develop knowledge, skills, values, and dispositions that support responsible commitment to human rights, sustainable development and living, and global well-being, thereby reflecting a truly global citizen.

Important Highlights in School Education

This policy envisages that the extant 10+2 structure in school education will be modified with a new pedagogical and curricular restructuring of 5+3+3+4 covering ages 3-18. Currently, children in the age group of 3-6 are not covered in the 10+2 structure as Class 1 begins at age 6. In the new 5+3+3+4 structure, a strong base of **Early Childhood Care and Education (ECCE)** from age 3 is also included, which is aimed at promoting better overall learning, development, and well-being.



Age	Stage / Curriculum	Grade	Years
3-8	Foundational part 1	3 years pre-primary	5
	Foundational part 2	Class 1 and 2	
8-11	Preparatory	Classes 3 to 5	3
11-14	Middle	Classes 6 to 8	3
14-18	Secondary	Phase I Classes 9-10	4
		Phase II Classes 11-12	

i. The formulation of a new and comprehensive **National Curricular Framework for School Education**, NCFSE 2020-21, will be undertaken by the NCERT

ii. The aim of assessment in the culture of our schooling system will shift from one that is summative and primarily tests rote memorization skills to one that is more regular and formative

iii. It is proposed to set up a National Assessment Centre, PARAKH (**Performance Assessment, Review, and Analysis of Knowledge for Holistic Development**), as a standard-setting body under MHRD that fulfils the basic objectives of setting norms,

standards, and guidelines for student assessment and evaluation for all recognized school boards of India, guiding the State Achievement Survey (SAS) and undertaking the National Achievement Survey (NAS).

iv. The NCERT and NCTE will develop guidelines for the education of gifted children. B.Ed. programmes may also allow a specialization in the education of gifted children.

v. Merit based results from National, and International Olympiads, and results from other relevant national programmes, as part of the criteria for admissions into their undergraduate programmes.

vi. A common guiding set of **National Professional Standards for Teachers** (NPST) will be developed by 2022, by the National Council for Teacher Education in its restructured new form as a Professional Standard Setting Body (PSSB) under the General Education Council (GEC), in consultation with NCERT, SCERTs

vii. By 2021, a new and comprehensive National Curriculum Framework for Teacher Education,NCFTE 2021, will be formulated by the NCTE in consultation with NCERT, based on the principles of this National Education Policy 2020.

Progress towards bridging gender and social category gaps in all levels of school education **Socio-Economically Disadvantaged Groups** (SEDGs) can be broadly categorized based on the following:

- Gender identities (particularly female and transgender individuals)
- Socio-cultural identities (such as Scheduled Castes, Scheduled Tribes, OBCs, and minorities)
- Geographical identities (such as students from villages, small towns, and aspirational districts)
- Disabilities (including learning disabilities)
- Socio-economic conditions (such as migrant communities, low income households, children in vulnerable situations, victims of or children of victims of trafficking, orphans including child beggars in urban areas, and the urban poor).

The Policy also recognizes the importance of creating enabling mechanisms for providing Children With Special Needs (CWSN) or *Divyang*, the same opportunities of obtaining quality education as any other child.

It is recommended that regions of the country with large populations from educationally-disadvantaged SEDGs should be declared **Special Education Zones** (SEZs), where all the schemes and policies are implemented to the maximum through additional concerted efforts.

While the establishment of primary schools in every habitation across the country-driven by the Sarva Shiksha Abhiyan (SSA), now subsumed under the Samagra Shiksha Scheme.

> Samagra Shiksha - an overarching programme for the school education sector extending from pre-school to class 12 has been, therefore, prepared with the broader goal of improving school effectiveness measured in terms of equal opportunities for schooling and equitable learning outcomes. It subsumes the three erstwhile Schemes of Sarva Shiksha Abhiyan (SSA), Rashtriya Madhyamik Shiksha Abhiyan (RMSA) and Teacher Education (TE).

One possible mechanism for accomplishing the above would be the establishment of a grouping structure called the **school complex**, consisting of one secondary school together with all other schools offering lower grades in its neighbourhood including Anganwadis, in a radius of five to ten kilometers. This suggestion was first made

- Use of IT and current technologies in respect of the academic and administrative activities of the college
- Participation in sports and other co-curricular and extra-curricular activities by the students
- Research output
- Help provided to poor students
- Participation in community affairs
- Evidence of concern for environment
- Introduction of vocational courses and skill oriented programmes

According to UGC total no. of universities in the country as on 01. 02. 2020

Universities	Total Number
State Universities	409
Deemed to be Universities	127
Central Universities	50
Private Universities	349
Total	935

Previous NET Questions (Self Evaluation):

1. Which of the following is entrusted with the responsibility of coordination and quality of higher education in India? (D 2018)
   A. Bar Council of India
   B. Association of Indian Universities
   C. University Grants Commission
   D. NITI Ayog
2. Choose the institution which is not authorized to confer degree according to UGC Act 1956? (D 2019)
   (a) Institutions established under linguistic minority
   (b) Deemed to be Universities
   (c) Constituent Colleges
   (d) Affiliated Colleges

   Choose the correct option:
   A. (a), (b) and (d) only
   B. (a), (b) and (c) only
   C. (b),(c) and (d) only
   D. (a), (c) and (d) only
3. From the following identify the organization that provides a common platform at all universities including institutions of national importance: d 2019
   A. University Grants Commission
   B. Association of Indian universities
   C. Distance Educational Council
   D. Indian Institute Advanced study
4. Which one of the following coordinates, promotes and funds research activities of all social sciences disciplines? (J 2019)
   A. ICPR, New Delhi
   B. IIAS, Shimla
   C. ICSSR, New Delhi
   D. NUEPA, New Delhi
5. The premier organisation established in India to deal with capacity building and research in planning and management of education in India and South Asia is? (J 2019)
   A. MU
   B. SAARC University
   C. NUEPA
   D. Nalanda University
6. Which of the following statements represent the main functions of UGC? J 2019
   (i) Recognition of institutions
   (ii) Maintenance of quality and standards
   (iii) Appointment of Vice Chancellor

(iv) Giving grants to institutions

(v) Making state governments responsible for educational development

Choose the correct answer from the options given below:

A. (i), (ii) and (iii)

B. (i), (iii) and (iv)

C. (i), (ii) and (iv)

D. (ii), (iii) and (v)

7. University and University-level institutions are categorised into: (D2018)

(a) Central Universities

(b) State Universities

(c) Private Universities

(d) Deemed-to-be Universities

(e) Institutions of higher learning

(f) Civil Sector Universities

A. (a), (b), (c) and (d)

B. (b), (d), (e) and (f)

C. (a), (c), (e) and (f)

D. (c), (d), (e) and (f)

8. Which of the following bodies/ units in a University has a statutory function to perform? (D 2018)

A. Board of Studies

B. Finance Committee

C. Board of Management

D. Research Degree Committee

9. For the day to day administration of University, which of the following bodies is responsible? (J 2019)

A. Senate

B. Syndicate/Executive council

C. Student council

D. Academic council

10. Who is the administrative and academic head of Indian university system? (D 2018)

A. Chancellor of a university

B. Vice-chancellor of a university

C. Register of a university

D. Dean of studies in a university

Answer Key

1	2	3	4	5	6	7	8	9	10
C	D	B	C	C	A	A	C	B	B

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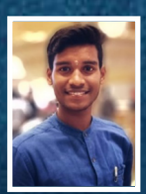
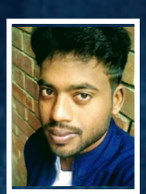


Ajay Mukund
99.57
JRF

Vishaal
99.33
JRF

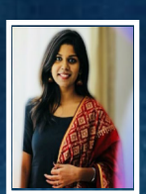
Kavya Shree
99.9
JRF

S.Sindhuja
99.6
JRF

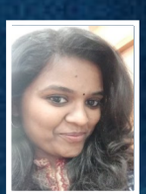


Vignesh
99.11
JRF

Pavithra.R
99.16
JRF



Vidhya.J
99.74
JRF



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HIGHER EDUCATION – AN INTERNATIONAL SCENARIO

The world has realized that the economic success of the states is directly determined by their education systems. Education is a Nation's Strength. A developed nation is inevitably an educated nation. Indian higher education system is the third largest in the world, next to the United States and China. Since independence, India as a developing nation is contentiously progressing in the education field. Although there have been lot of challenges to higher education system of India but equally have lot of opportunities to overcome these challenges and to make higher education system much better. It needs greater transparency and accountability, the role of colleges and universities in the new millennium, and emerging scientific research on how people learn is of utmost important. India need well skilled and highly educated people who can drive our economy forward. India provides highly skilled people to other countries therefore; it is very easy for India to transfer our country from a developing nation to a developed nation. UGC is continuously working and focusing on quality education in higher education sector. Still we are facing lot of problems and challenges in our education system. Some of the basic challenges in higher education system in India are:

Enrolment: The Gross Enrolment Ratio (GER) of India in higher education is only 15% which is quite low as compared to the developed as well as, other developing countries. With the increase of enrolments at school level, the supply of higher education institutes is insufficient to meet the growing demand in the country.

Equity: There is no equity in GER among different sects of the society. The GER in higher education in India among male and female varies to a greater extent. There are regional variations too some states have high GER which reflect a significant imbalances within the higher education system.

Quality: Quality in higher education is a multi-dimensional, multilevel, and a dynamic concept. Ensuring quality in higher education is amongst the foremost challenges being faced in India today.

Infrastructure: Poor infrastructure is another challenge to the higher education system of India particularly the institutes run by the public sector suffer from poor physical facilities and infrastructure.

Political interference: Most of the educational Institutions are owned by the political leaders, who are playing key role in governing bodies of the Universities. They are using the innocent students for their selfish means. Students organise campaigns, forget their own objectives and begin to develop their careers in politics.

Faculty: Faculty shortages and the inability of the state educational system to attract and retain well qualified teachers have been posing challenges to quality education for many years. Large numbers of NET / PhD candidates are unemployed even there are lot of vacancies in higher education, these deserving candidates are then applying in other departments which is a biggest blow to the higher education system.

Accreditation: As by the NAAC, "not even 25% of the total higher education institutions in the country were accredited".

Research and Innovation: There are very nominal scholars in our country whose writing is cited by famous western authors. There is inadequate focus on research in higher education institutes. There are insufficient resources and facilities, as well as, limited numbers of quality faculty to advice students. Most of the research scholars are without fellowships or not getting their fellowships on time which directly or indirectly affects their research.

Structure of higher education: Management of the Indian education faces challenges of over centralisation, bureaucratic structures and lack of accountability, transparency, and professionalism. As a result of increase in number of affiliated colleges and students, the burden of administrative functions of universities has significantly increased and the core focus on academics and research is diluted.

Issues like teaching quality, language of instruction, Quota system, moral issues, gender can also be the major challenges of Higher Education.

Brain Drain Problem:

Human Capital Flight also referred as brain drain is the immigration of individuals from the native land to other countries for better occupation. The brain drain is the migration of educated persons from one country (often a developing country) to other (often more developed ones). India is a major supplier of skilled and unskilled human capital for the advanced economies. India is sending large numbers of these specialists compared to other important origin countries.

The lack of opportunities, political instability, economic depression, Poor infrastructure, Corruption, No value of talent, health risks in India and rich opportunities, political stability, academic freedom, best research facilities and freedom, developed economy, better living conditions in host countries are the main push and pull factors. The individual reasons like family influence, peer pressure, unemployment and personal preference: preference for exploring, ambition for an improved career can also be considered.

WTO-GATS and the Education Sector in India:

India's abundant skilled labour force, English-speaking and technically trained manpower, there exists immense opportunities for India for liberalisation of its education sector under the WTO (World Trade Organization). The General Agreement on Trade in Services (GATS) is a legally binding agreement aimed at deregulating trade in services. In 1996, the coverage of the GATS Agreement was extended to include educational services. Since education in most developing economies is a government service activity, it should thus lie outside the scope of "free trade".

India is in full compliance with the WTO –GATS agreement on higher education. It also allows participation of domestic educational institutions with their foreign counterparts through twinning, collaborations, franchising and by setting up subsidiaries. The GATS treats higher education as a tradable commodity. GATS included higher education as a commodity in the global market thus changes like export and import of education, sale of educational products, consumers and buyers, sellers, making a surplus, turnover, equity shares, and so on becomes common.

International higher education under the GATS

Mode	Description	Examples	Mobility
Mode 1	Cross-border	Supply Distance learning, online, franchising	Programme mobility
Mode 2	Consumption abroad	Students travel to other countries	Student mobility
Mode 3	Commercial presence	Branch campus, joint venture, investment	Institution mobility
Mode 4	Delivery abroad	Faculty, researchers move to other countries	Academic mobility

Major Foreign Direct Investments (FDI) into the education sector in India:

The Indian government allows hundred percent FDI in higher education services.

- According to the Department for Promotion of Industry and Internal Trade (DPIIT), the total amount of Foreign Direct Investment (FDI) inflow into the education sector in India stood at USD 2.47 billion from April 2000 to March 2019.
- The sector is expected to reach US$ 1.96 billion by 2021 with around 9.5 million users.
- The e-learning sector in India is expected to reach US$ 1.96 billion by 2021 with around 9.5 million users.
- In August 2019, Maharashtra International Education Board (MIEB) has signed a collaboration agreement with Google for Education in India.
- Singapore is going to open its first skill development centre in Assam, which will provide vocational training to youth in the region.
- The Ministry of Human Resource Development, Government of India is planning to raise around Rs 1 lakh crore (USD 15.52 billion) from private companies and high net worth individuals to finance the improvement of education infrastructure in the country.

Previous NET Questions (Self Evaluation):

1. Brain drain problem which was dominant in the middle of 20th Century in India is indicative of which one of the following aspects?
   i. Lack of adequate facilities for advanced study and research in India
   ii. The capacity of the developed nations to buy the talent at a price beyond the means of the developing nations
   iii. Increase of population and under utilization of human research

   Choose the correct option from below :

   A. Only (i) and (iii) B. Only (ii) and (iii)

   C. Only (iii) D. Only (i) and (ii)

2. India has the largest Higher Education System in the World after:

   (a) The United States of America

   (b) Australia

(c) China

(d) United Kingdom (UK)

Select the correct answer from the code given below:

A. (a), (b), (c) and (d)

B. (a), (b) and (c) only

C. (a), (c) and (d) only

D. (a) and (c) only

3. According to GATS (General Agreement on trade and Services), higher education should be a commodity in the

A. Domestic public sector

B. Domestic private sector

C. Non – trading sector

D. Global market place

4. The major barriers for access to higher education in India are:

(a) More opportunities of employment for less educated

(b) Government polices

(c) Language of instruction

(d) Economic status

(e) Competition from foreign universities

(f) Gender discrimination in society

Choose the correct answer from the option given below:

A. (a), (b) and (c)

B. (b), (c) and (e)

C. (c), (d) and (f)

D. (d), (e) and (f)

5. Which of the following are the demerits of globalisation of higher education?

(a) Exposure to global curriculum

(b) Promotion of elitism in education

(c) Commodification of higher education

(d) Increase in the cost of education

Select the correct answer from the codes given below:

A. (a) and (d)

B. (a), (c) and (d)

C. (b), (c) and (d)

D. (a), (b), (c) and (d)

Answer Key

1	2	3	4	5
D	D	D	C	C

Choose the correct option

A. (i), (ii) and (iii)

B. (ii), (iv) and (v)

C. (i), (iii) and (iv)

D. (ii), (iii) and (v)

4. Snowball sampling is the process of selecting a sample using: June 2019

A. Networks

B. Groups

C. Snowballs

D. Computer Programs

5. Which of the two statements from the following statements are correct? 2019Dec

a) Sampling – related error is subsumed under the category non – sampling error

b) Sampling error doesn't occur in multi-stage cluster sampling

c) Inaccurate sampling frame and non response are examples of sampling related error.

d) There is an inverse relation between heterogeneity of population and sampling error.

Choose the correct option

A. (a) and (c) only

B. (a) and (d) only

C. (b) and (d) only

D. (b) and (c) only

Answer Key

1	2	3	4	5
B	B	D	A	D

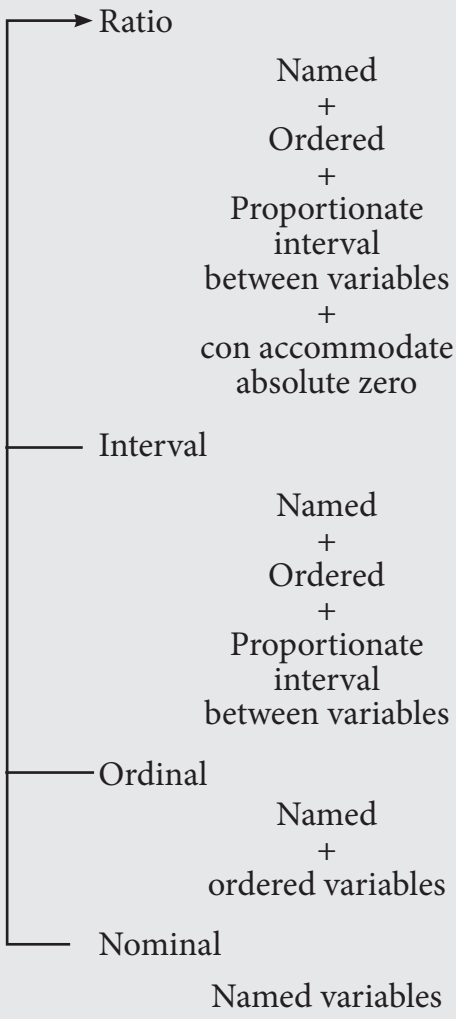
Data Collection

Data collection is the process of gathering, measuring, and analyzing information on systematic approach over target variable in order to answer the question or hypothesis framed by the researcher, data collection is an important step in research study irrespective of fields which require accurate and honest data that act as evidence.

Measurement scale:

Process of converting quality data in to quantitative data assigning numerical value, in the order to convert the measurement scale approached four kinds of measurement namely nominal, ordinal, interval and ratio.

Levels of Measurement



Nominal scale:

The scale lies with lower level of hierarchy which carried in the order to category the variables in to certain scale, the carried by naming (eg: gender, respondent give male or female) which researcher assign some value like 1,2, etc.., in order to assign numerical value. This scale is said to be weak scale in the order as no test can be carried using nominal data only sub grouping of task can be performed.

Example: marital status, family type, etc..,

Ordinal scale:

As name indicates ordinal scale deals with ordering or ranking the person, objects, events ect. The researcher rank the respondents to place from high to low in meaningful scale, this ordering provide more information than nominal scale but not reveal much relevant source of information. This scale used by researcher to rank the respondents in intension to category them in different levels. Example: Annual income is derived to order them in socio economic group such as low income group, middle income group or high income group, asking respondents to rank five favourite authors.

Interval scale:

Interval scale is step behind sophisticate scale of measurement, with meaningful interval. The scale falls under 3rd step of hierarchy which assigned numerical value, ranked and arranged with an equal interval. The meaningful interval implies the difference between value 10-20 is same difference between stated in value 60-70 through this scale all kind of statistical operation can be carried out from regression test to simple arithmetical test. The test lack the value zero, which here is nothing but another value, the value zero does not implies absence of something.

Example: Celsius/Fahrenheit temperature scale –80 degrees is always higher than 50 degrees and the difference between these two temperatures is the same as the difference between 70 degrees and 40 degrees, in temperature scale the value 0 does not mean the absence of temperature, it is simply another value to measure the temperature in room.

Ratio scale:

The ratio scale is most sophisticated scale lies in top order of measurement which has similar interval with meaningful zero value, The true zero allows us to know how many times greater one case is than another. The ratio scales consist of all the qualities of other three scale with meaningful zero i.e the zero of something is absence of that value, Eg: 0 bank balance in the bank account indicates no money in the account.

Data collection methods:

There are two types of method in collecting data

i) Primary data

ii) ii) secondary data

Primary data: The data collected as prime source or firsthand information for the study gathered by the researcher.

Secondary data: The data which has already published in some source reliable to the study example: journal, article, etc..,

Quantitative Data Collection Methods

Quantitative data is data generated in numerical form which converted into useful information with mathematic approach most often statistic approach give accurate result, qualitative study often carried out for research consist of large sample in order to make easy approach.

- **Quantitative Surveys**

This survey consist of close end questioner with already determined option give in the order to choose, choice is minimum in which responded should pick what they feel appropriate.

- **Interviews**

The set of questions are predetermined with the decided standards. One to one interview is most

structured way to collect response data. The interview is classified in to two types

Structured Interviews: This interview is based on quantitative study with survey format approached with research tools the intension of research is to maintain uniformity throughout the data collection. The interview focus on two types of questioner closed ended question which deals with choice of respondents and open ended question which deals with the preference or interesting facts about respondents.

Unstructured Interviews

In unstructured interview researcher will have casual conversation with respondents with a motive of collecting information for research hidden in it, this kind of interview have minimum question session focus on the stories given by respondent, this interview act as friendly session where respondents tent to give true data.

Methods:

Face to face: The researcher and respondent will meet personally in the venue decided in discussed time. It helps interviewer to have a clarified session due to personal interaction with the respondents.

- **Computer-assisted interviews**

The questions already feed in the system with facility to record the response. The respondent will directly enter in to the data base and give the response on the time comfortable.

- **Questionnaire**

A set of questions framed for the purpose of collecting data for the study. It is commonly primary data studies for large sample which can be quantified easily. Questioner is depending on the survey and data required by the researcher. This format is proved to receive most accurate data and statistical test can be performed easily.

The questioner classified in to two types:

Closed ended questioner: These types used highly in quantitative studies where the set of answers already exist the respondent are asked to pick the options available to them. The data focused on the objectivity where the chances of biased opinion are minimum. Closed end questionnaire are highly reliable data which can be proved with help of statistical tools and analysis

Types of closed ended questionnaire

- Dichotomy or forced choice questions
- Multiple choice questions
- Rank ordering questions
- Rating scales questioning
- Ratio data questions

Dichotomous or forced choice questions:

This question as name indicates give "di" or two choices in which respondents are forced to choose one among them. This kind is used only when the choice is left with two options, usually in research questionnaire such kinds are avoided as the restriction of choice is high which make the data very crucial Example: do you having smoking habit? Yes or No.

Do you collect social security benefits?	Yes	No
Mark your answer in the appropriate box		

What is your gender?	Male	Female
Mark your answer in the appropriate box		

Multiple choice questions:

The questions consist of multiple alternative answers on which respondents are asked to make choice which they find suitable over the situation. This is most preferred questioner from which can be analysed with computer evaluation used in many national level examination.

It focuses on the consequences or 'end' of an action to determine whether it is morally right.	It focuses on the motivation for undertaking an action.
Utilitarianism is often cited as a paradigmatic example of teleological ethics, as utilitarianism holds that an action is to be judged by its ability to bring about the greatest happiness for the greatest number of persons.	Kantian ethics is usually cited as the paradigmatic case of deontological ethics; Kant placed great emphasis upon duty, and held that nothing is good in itself except the good will.
Teleological ethics is also called consequentialism.	Deontological ethics is often referred as "duty-based" ethics.

Following are the few principles of Research Ethics.

- **Minimising the risk of harm**

During research the researcher should be careful in taking care of their subjects. It is important to prevent any intentional harm or minimize any aspect of potential harm by refraining from injuring the respondent either physically or psychologically. The concept of non-maleficence focuses on avoiding harm. Not only avoiding harm; doing good and justice for the subject is also the major duty of the researcher. The principle of beneficence makes the researcher responsible for the physical, mental, and social well-being of the research participant. Beneficence means to do good for the people involved.

Bad Apple theory

The term is derived from Latin translated proverb "The rotten apple injures its neighbours". The "bad apple theory" holds that most researchers are highly ethical apart from a few who are morally corrupt.

- **Principle of privacy**

All researchers conducting research which involves humans have a duty to protect the privacy of their participants. Informed Consent is a voluntary agreement of the subject to participate in research. It is a process, in which the subject has an understanding of the research and its risks. Obtaining consent involves informing the subject about his or her rights, the purpose of the study, the procedures to be undergone, and the potential risks and benefits of participation. There are two main ways to ensure that the privacy of participants is being respected: (1) by conducting anonymous research, and (2) by conducting confidential research. Anonymity in research means that at no time will the researcher or anyone associated with the project know the identity of the participants. Confidentiality in research means that proper safeguards are in place to protect the privacy of participants and their information from unauthorized access, use, disclosure, modification, loss, and theft.

- **Avoid deceptive practice**

Deception means researchers providing false or incomplete information to participants for the purpose of misleading research subjects. The researcher should avoid deceiving participants about the nature of the research unless there is no alternative. However, there are some types of research that needs deceptive practices for the research which having higher human values.

- **Debriefing**

Debriefing is a short interview that takes place between researchers and research participants immediately following their participation in a research experiment. The debriefing is an important ethical consideration to make sure that participants are fully informed about and not psychologically or physically harmed in any way by, their experience in an experiment. The purpose of debriefing is to remove any misconceptions and anxieties that the participants have about the research and to leave

them with a sense of dignity, knowledge, and a perception of time not wasted.

Stressful or imperfect environment theory

This theory expresses the notion that an institution has multiple pressures, incentives, ambitions in careers which force individuals or researchers to deviate from their norms and engage in misconduct.

- **Fabrication and Falsification**

Fabrication is the intentional misrepresentation of research results by making up data. For example reporting experiment data that were never conducted. Sometimes fabrication is referred as "dry labbing". Falsification is the manipulation of materials, equipment, processes, by changing results or omitting some data or findings so that the research does not seem to have been well represented or recorded. Any researcher who is involved in such a practice violates the primary objective of research ethics which renders him or her untrustworthy and could mislead other scholars, while at the same time undermining their own academic authority.

- **Plagiarism**

Plagiarism is defined as "taking someone else's work or idea and passing them as one's own without acknowledging it". According to APA (American Psychological Association) manual of style "Plagiarism is an act of presenting the words, ideas, or images of another as your own; it denies authors or creators of content the credit they are due". The researcher while reporting his research should recognize the secondary sources which he made use for his research. The thesis which fails to recognize the secondary sources is considered as inadmissible. The University Grants Commission (UGC) of India has adopted regulations on academic plagiarism saying 10% plagiarism of a thesis, article, book, research paper, or other document is acceptable, but that more extensive copying will result in severe punishments. It also insists the institutions to use plagiarism-detection software, such as Turnitin, on students' theses and researchers' manuscripts in order to check the level of plagiarism.

Self Evaluation:

1. Which of the following generally cannot be done in qualitative studies conducted in the field?
   A. Getting informed consent
   B. Keeping participants from physical harm
   C. Maintaining consent forms
   D. Having full anonymity rather than just confidentiality
2. What is it called when the participants are not revealed to anyone but researcher and staff?
   A. Confidentiality
   B. Anonymity
   C. Ethics
   D. Discretion
3. Research participants must give what before they can participate in a study?
   A. Guidelines
   B. A commitment
   C. Informed consent
   D. Private information
4. What is our general advice with respect to the concept of doing no harm?
   A. So long as you did not set out to harm participants you have nothing to worry about
   B. Research that involves risk to participants should not be carried out by students
   C. There are typically no hazards in student research studies.
   D. None of the above
5. How do we distinguish between confidentiality and anonymity?
   A. Data collection can be described as

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anonymous if you do not know who has taken part in your study.

B. Confidentiality can be promised in circumstances when you know who has taken part in your study but you do not divulge this information to other people

C. Both of the above

D. Neither A nor B

Answer Key

1	2	3	4	5
D	A	C	D	C

Previous NET Questions:

1. Which two among the following factors are responsible for transgression of ethical principle in research? 2019 Dec

a) Harm to the participants

b) Lack of informed consent

c) Non greeting the participants after the experiment is over

d) Asking difficult questions

A. (a) and (c) only

B. (b) and (c) only

C. (a) and (d) only

D. (a) and (b) only

2. 'Research ethics' is of critical importance in which of the following areas? Select your answer from the code given below. June 2019

a) Data collecting

b) Preparing a seminar paper

c) Data analysis

d) Participation in a conference

e) Writing a thesis/dissertation

f) Selecting a research problem

A. (a) (b) and (c)

B. (a) (c) and (e)

C. (d) (e) and (f)

D. (a) (b) and (f)

3. The problem of 'research ethics' is concerned with which aspect of research activities? July 2018

A. Following the prescribed format of a thesis

B. Data analysis through qualitative or quantitative technique

C. Defining the population of research

D. Evidence based research reporting

4. Plagiarism in research is

A. Creative use of previous data

B. Copying unscrupulously and making use of it

C. Quoting someone and citing him/her

D. Referring to previous data and working over it with new objectives

5. Identify those stages/steps of research in which ethical considerations become relevant. Choose from the code to give your answer. Dec 2018

(a) Identifying and defining research question.

(b) Postulating relationships among variables to advance a solution.

(c) Collecting data through use of research tools.

(d) Defining the population and sampling procedure.

(e) Data analysis and procedure employed.

(f) Reporting procedure of findings/results.

Options:

A. (a), (b) and (c)

B. (c), (e) and (f)

C. (b), (c) and (d)

D. (b), (c) and (f)

Answer Key

1	2	3	4	5
D	B	D	B	B

From our students..

I did my post graduation through distance education. I was not confident about my eligibility for NET exam before joining Professor Academy. My love for challenges ignited the interest for clearing the exam despite people around me saying that I may not be able to clear. Being a mother of 3 children my preparation was hectic. I was not able to prepare continuously like others, there were numerous hindrances, but tried to prepare whenever and wherever I could . Study plan, smart work, practicing, being self motivated and never giving up was my key to success. JRF in first attempt was a dream came true. Thank you Professor Academy.

- Eube Blossom

While preparing for paper 1, concentration is needed for DI, reading comprehension and reasoning, because scoring in this sections, is important for JRF.... solving 3 DI and 3 comprehension per day, will help on the exam day for time saving. Regular test series and discussion session provided by Professor Academy and team through App helped me in managing time and stress in exam hall.

- K. Thenmozhi

"You need to train regularly to win the race. Similarly, if you want to crack the first paper you have to practice constantly. The ground (Place) I practised at Professor Academy."

- Mohanraj A

Yes We Can

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From our students..

I grew up detesting Math problems, because they weren't always my best try. Anything that included numbers and figures repelled me, which resulted in me putting the least effort to understand the problem. Logical reasoning in the first paper gave me a huge shock in the initial times, but I wanted to give it a try. Once I understood the concept with a little amount of practice, I got hold of the tricks that came along. And that's how Logical reasoning became my favorite concept in the entire syllabus!

-Thamileelam Socrates

Success is the fruit of hard work and smart work. It wasn't difficult to climb, as I sowed the seed of success in the PROFESSOR ACADEMY. The time was very short to clear the NET Exam, So I concentrated whole heartedly on Paper I, with sheer dedication and the support given by them. The Academy made the path clear with their skillful teaching, guidance, friendly and positive approach. It wasn't difficult for me to cross the hurdles within 2 months with PROFESSOR ACADEMY by my side. Why not you?

- Madhumathi S P

I completed PG in 2004. After many jobs across various fields for 15 years, I joined Professor Academy in 2019 and got qualified in NTA NET in first attempt itself. In my humble opinion, one can pre-decide their success by managing Time and energy, repeated practice of test series and steady focus. Happy learning!!!

- Deepa A

From our students..

Before joining academy, I was totally not familiar with Paper-I topics. But Professor Academy was so meticulous in training, which changed the perspective of learning. I was fortunate to have good faculties who have vast knowledge in subject. Other than teaching, they helped me to gain more confidence and positive attitude through motivational talks. Repeated tests helped us to gain in-depth knowledge and reduced time-to-solve. All the faculties were always ready to extend help through whatsapp and kept on posting current updates in the group. Above all I realised that "YES I CAN" before appearing for the exam. Strategic planning, Time Management and Confidence led by the academy helped me to get through the exam successfully. My heartfelt Thanks to Director Sir and faculties who helped me to achieve this.

- Ms.Lija

Heartfelt thanks to Professor Academy for helping me crack NET in my first attempt. I found the classes truely interesting and rewarding. Efficacious Lectures by experts, repeated tests, doubt solving sessions and the encouragement of the staff members helped me face UGC-NET with great confidence. The faculty are ever ready to help the aspirants and the students are provided with simplified study materials for both paper I and ll which make learning easy and organised. THANK YOU IS NOT ENOUGH TO EXPRESS MY GRATITUDE

- Nishikha

You may have the question why should I study for paper 1 even though I'm a Master in my subject..I too had the same question in my early preparation time, then I realised something... We prefer shopping malls instead of showrooms, so that we can have plenty of choice, like that the ultimate aim of the teacher is not only teaching the subject but teach for the life... Paper 1 is the major phenomenon which prepares you for the real-time... You can't lead a healthy and peaceful life without environmental conscious. You can't make your teaching effective one without knowing the teaching methodology and the classroom management, You may fail to guide your student if you are not aware of our Higher education policies... I'm sure these things will make an effective impact in your behaviour when you are guided by the eminent personalities who taught me all these things in a single place, that's the uniqueness of Professor Academy.

- Anandhababu