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UPSC ENGINEERING SERVICES EXAMINATION
Preliminary Examination

General Studies and Engineering Aptitude

Basics of Energy and Environment

Comprehensive Theory with Practice Questions and ESE Solved Questions

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E-mail: infomep@madeeasy.in
Contact: 011-45124660, 08860378007
Visit us at: www.madeeasypublications.org

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Preface

The compilation of this book **Basics of Energy and Environment** was motivated by the desire to provide a concise book which can benefit students to understand the concepts of this specific topic of General Studies and Engineering Aptitude section.

This textbook provides all the requirements of the students, i.e. comprehensive coverage of theory, fundamental concepts and objective type questions articulated in a lucid language. The concise presentation will help the readers grasp the theory of this subject with clarity and apply them with ease to solve objective questions quickly. This book not only covers the syllabus of ESE in a holistic manner but is also useful for many other competitive examinations. All the topics are given the emphasis they deserve so that mere reading of the book clarifies all the concepts.

We have put in our sincere efforts to present detailed theory and MCQs without compromising the accuracy of answers. For the interest of the readers, some notes, do you know and interesting facts are given in the comprehensive manner. At the end of each chapter, sets of practice question are given with their keys and detailed explanations, that will allow the readers to evaluate their understanding of the topics and sharpen their question solving skills.

Our team has made their best efforts to remove all possible errors of any kind. Nonetheless, we would highly appreciate and acknowledge if you find and share with us any printing and conceptual errors.

It is impossible to thank all the individuals who helped us, but we would like to sincerely thank all the authors, editors and reviewers for putting in their efforts to publish this book.

With Best Wishes

**B. Singh**

CMD, MADE EASY Group
# Basics of Energy and Environment

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Objective Brain Teasers
6.1 Introduction

- Environmental Impact Assessment (EIA) is the formal process used to predict policy, programme or project prior to the decision to move forward with the proposed action. It is an important management tool for ensuring optimal use of natural resources for sustainable development.

- EIA is just an information gathering exercise carried out by the developer and other bodies which enables a Local Planning Authority to understand the environmental affects of a development before deciding whether it should go ahead or not.

- It is meant to be a systematic process which leads to a final product the Environmental Statement (ES). The ES has to address the direct and indirect effects of the development on a number of factors including the population, fauna, flora, soil, air, water, climatic factors, landscape and archaeology. The ES must also contain a non-technical summary so that involved persons can understand what is being proposed and its likely effects.

- The EIA process finds its origin from United States where due to huge public pressure, the government enacted National Environmental Policy Act (NEPA) in 1970s.

- The role of EIA process was formally recognized at the Earth Summit in Rio de Janeiro in 1992 in which the Rio Declaration stated that EIA shall be taken as national instrument for proposed projects which might adversely impact the environment.

- In India, EIA started in 1976-77 when erstwhile Planning Commission asked the Department of Science and Technology to examine the river valley projects from an environmental angle. This was subsequently extended to cover those projects which require approval of Public Investment Board.

- EIA has been addressed some of the basic factors listed below:
  (i) Meteorology and air quality
  (ii) Hydrology and water quality
  (iii) Site and its surroundings
  (iv) Occupational safety and health
  (v) Details of the treatment and disposal of effluents (solid, air and liquid) and methods of alternative uses
  (vi) Transportation of raw material and details of material handling
  (vii) Control equipment and measure proposed to be adopted

- The main objective of EIA is to ensure that development is sustained with minimal environmental degradation.

- The Union Ministry of Environment, Forest and Climate Change has been assigned the responsibility for arraying out environmental impact assessment in India.

- The developmental projects are required to prepare an environmental impact assessment covering the following:
(i) Effects on land including land degradation and subsidence
(ii) Deforestation and compensatory afforestation
(iii) Air and water pollution including ground water pollution
(iv) Noise pollution and vibrations
(v) Flora and fauna, and loss of biodiversity
(vi) Socio-economic impact including human displacement, cultural loss and health aspects
(vii) Risk analysis and disaster management
(viii) Recycling and the reduction of waste
(ix) Efficient use of inputs

- The coverage of the projects generally includes:
  (i) Those requiring clearance from the public investment boards
  (ii) Projects referred by state governments or administrative ministers
  (iii) Projects in sensitive areas
  (iv) Projects on which there are public complaints

- The environmental impact assessment of development projects has so far been done on the basis of ‘Executive Order’ issuing the provision of the Environment (Protection) Act, 1986 to ensure implementation of the suggested safeguards.

- All projects and activities are broadly categorized into two categories – Category A and Category B, based on the spatial extent of potential impacts on human health, and natural and man-made resources.
  
  **Category ‘A’:** All projects or activities which have been included as Category ‘A’ in the Schedule, including expansion and modernization of existing projects or activities and change in product mix, shall require prior environmental clearance from the Central Government on the recommendations of an Expert Appraisal Committee (EAC) to be constituted by the Central Government for the purposes of this notification.

  **Category ‘B’:** All projects or activities which have been included as Category ‘B’ in the Schedule, including expansion and modernization of existing projects or change in product mix, but excluding those which fulfill the General Conditions (GC) stipulated in the Schedule, will require, prior environmental clearance from the State/Union territory Environment Impact Assessment Authority (SEIAA). The SEIAA shall base its decision on the recommendations of a State or Union territory level Expert Appraisal Committee (SEAC) as to be constituted for in this notification. In the absence of a duly constituted SEIAA or SEAC, a Category ‘B’ project shall be treated as a Category ‘A’ project.

### 6.2 EIA Regulations

- The EIA regulations define two schedules of developments. For Schedule-1 projects, an EIA must always be carried out. For Schedule-2 projects, an EIA must be carried out if the development is likely to have a significant impact on the environment by virtue of its nature, size or location.

**Examples of Schedule-1 projects include:**
- Major power plants
- Chemical works
- Waste disposal plants
- Major road schemes
Examples of Schedule-2 projects include:

- Quarries and opencast
- Some intensive live-stock rearing
- Overhead transmission lines
- Surface storage of fossil fuel
- Foundries and forges
- Coke ovens
- Manufacture of dairy products
- Brewing
- Some textile operations
- Rubber production
- Wide range of infrastructure projects
- Waste water treatment plants
- Holiday villages
- Golf courses

A proposed development only becomes a Schedule-2 development where it exceeds the threshold. For example a 'shipyard' development only falls within Schedule-2 where the area of new floor space exceeds 1,000 meter². Just because a project falls within one of the categories set out in Schedule-2 and exceeds the Schedule-2 threshold does not mean that EIA is required.

Example 1.

Which of the following items will be relevant to properly conduct the needful Environmental Impact Assessment at a locality for any project coming up there?

1. The lay of the land, particularly large depressions which may hold water of any source
2. Prevailing or predominant wind directions throughout the year in the locality
3. Food habits of the local population
4. Whether sanitary fills for disposal of Municipal wastes are in the neighbourhood
5. Nearness to National Highways
6. Availability of higher educational institutions in the vicinity

Select the correct answer using the codes given below:

(a) 2, 3 and 6  
(b) 1, 3 and 5  
(c) 1, 2 and 4  
(d) 2, 4 and 6

[Sample Question for ESE 2017 : Released by UPSC]

Ans. (c)

6.3 Steps in Environmental Impact Assessment Process

- EIA represents a systematic process that examines the environmental consequences of the development actions in advance. The emphasis of a EIA is on prevention and therefore it is more proactive than reactive in nature.
The EIA process involves a number of steps, some of which are listed below:

(i) **Project screening**: This entails the application of EIA to those projects that may have significant environmental impacts.

(ii) **Scoping**: This step seeks to identify at an early stage of the key significant environmental issues among a host of possible impacts of a project and all the available alternatives.

(iii) **Consideration of alternatives**: This seeks to ensure that the proponent has considered other feasible approaches including alternative project locations, scales, processes, layouts and operating condition.

(iv) **Description of the project/development action**: This step seeks to clarify the purpose and rationale of the project and understand its various characteristics including the stages of development, location and processes.

(v) **Description of the environmental baseline**: This includes the establishment of both the present and future state of the environment in the absence of the project by taking into account the changes resulting from natural events and from other human activities.

(vi) **Identification of key impacts**: This brings together the previous steps with a view to ensure that all potentially significant environmental impacts (adverse and beneficial) are identified and taken into account in the process.

(vii) **The prediction of impacts**: This step aims to identify the likely magnitude of the change (i.e., impact) in the environment when the project is implemented in comparison with the situation when the project is not carried out.

(viii) **Evaluation and assessment of significance**: This seeks to assess the relative significance of the predicted impacts to allow a focus on key adverse impacts. Formal definition of significance is the product of consequence and likelihood.

\[
\text{i.e. Significance} = \text{Consequence} \times \text{Likelihood}
\]
(ix) **Identifications of mitigating measures:** This involves the introduction of measures to avoid, reduce, remedy or compensate for any significant adverse impacts.

(x) **Public consultation and participation:** This aims to assure the quality, comprehensiveness and effectiveness of the EIA, as well as to ensure that the views of public are adequately taken into consideration in the decision-making process.

(xi) **EIS presentation:** This is a vital step in the process. If done badly, much good work in the EIA may be negated.

(xii) **Review of EIS:** This involves a systematic appraisal of the quality of the EIS as a contribution to the decision-making process.

(xiii) **Decision-making:** At this stage, decisions are made by the relevant authority of the EIS (including consultation responses) together with other material considerations as, whether to accept, defer or reject the project.

(xiv) **Post-decision monitoring:** This involves examining the outcomes associated with development impacts, after the decision to proceed with the project. It can contribute to effective project management.

(xv) **Auditing and predictions of mitigating measures:** This follows monitoring and involves comparing actual outcomes with predicted outcomes. It provides a vital step in the EIA learning process.

**Note:** EIA is a cyclical process involving feedback and interaction among the various steps and the sequence of the steps may also vary.

**Expert Appraisal Committee (EAC)**

- In order to elicit multi-disciplinary inputs for appraisal of projects, Union Government has constituted the EAC to ensure multi-disciplinary input required for environmental appraisal of following development projects:
  1. Mining Projects
  2. Industrial Projects
  3. Thermal Power Projects
  4. River valley, Multipurpose irrigation projects, Hydro-electric plants
  5. Infrastructure Development and Miscellaneous Projects
  6. Nuclear Power Projects

- The project authorities have to furnish the following documents for environmental appraisal of a developmental projects:
  1. Detailed Project Report (DPR)
  2. Filled in questionnaire, and
  3. Environmental Impact Statement (EIS) along with environmental management programme. EIS should provide the possible impact (positive or negative) of the project.

### 6.4 Roles of Parties in EIA Process

EIA involves many parties, grouped by their role definition within the process. The following section outlines the basic roles of various bodies:

- (i) Project Proponent
- (ii) Environmental Consultants
- (iii) State Pollution Control Board / Pollution Control Committees (PCCs)
- (iv) Public
- (v) Impact Assessment Agency
Role of the Project Proponent

- The project proponent during the project planning stage decides the type of projects i.e. new establishment, expansion or modernisation. Later, the project proponent needs to prepare the Detailed Project Report/Feasibility Report and submits the Executive Summary which shall incorporate the project details and findings of EIA study that is to be made available to public.

- The proponent has to approach the concerned State Pollution Control Board (SPCB) for No Objection Certificate (NOC) and holding the public hearing. After the public hearing, the proponent submits application to Impact Assessment Agency (IAA) for environmental clearance.

Role of Environment Consultant

- Environmental consultant should be conversant with the existing legal and procedural requirements of obtaining environmental clearance for proposed project. The consultant should also be fully equipped with required instruments and infrastructure for conducting EIA studies.

- An environmental consultant is responsible for supplying all the environment-related information required by the SPCB and IAA through the proponent. The consultant is also required to justify the findings in the EIA and Environmental Management Plan (EMP) during the meeting with the expert groups at IAA.

Role of the State Pollution Control Board (PCB)/Pollution Control Committee (PCC)

- The State PCBs/PCCs are responsible for assessing the compatibility of a proposed development with current operational and prescribed standards. If the development is in compliance, the PCB will then issue its NOC.

- They shall also hold the public hearing as per the provisions of EIA notification. The details of public hearing shall be forwarded to IAA.

Role of the Public

The public also has an important role to play in EIA. The concerned persons will be invited through press advertisement to review information and provide their views on the proposed development requiring environmental clearance.

Role of the Impact Assessment Agency (IAA)

- Whether a proponent is required to obtain environmental clearance, the IAA will evaluate and assess the EIA report. In this process, the project proponent will be given a chance to present his proposal. If a project is accepted, the IAA will also prepare a set of recommendations and conditions for its implementation based on this assessment.

- During the implementation and operation of the project, the IAA will also be responsible for the environmental monitoring process.

Note: If the EIA report has to incorporate the data of all four seasons of a year, then it is known as Comprehensive EIA, whereas if the EIA report has only one season data, then it is known as Rapid EIA.

6.5 Forms of Impact Assessment

There are various forms of impact assessment that are used to assess the consequences of development so that they are taken into consideration along with the environment assessment. One of the forms of impact assessment is strategic environment assessment, which is briefly discussed below:

Strategic Environment Assessment (SEA)

- Strategic Environment Assessment (SEA) refers to systematic analysis of the environmental effects of developmental policies, plans, programmes and other proposed strategic actions. This process extends
the principles of EIA upstream in the decision making process, beyond the project level and when major alternative are still open. SEA represents a proactive approach to integrating environmental considerations into the higher level of decision making.

- The primary objective of such a procedure is to ensure adequacy of suggested safeguards and also to undertake mid-course corrections required if any.
- The procedure adopted for monitoring is as follows:
  (i) Project authorities are required to report every six month on the progress of implementation of conditions/safeguards stipulated, while according clearance to the project.
  (ii) Field visits of officers and expert teams from the ministry and/or its regional offices are undertaken to collect analysed performance data of development projects, so that difficulties encountered are discussed with the proponents with a view of finding solutions.
  (iii) In case of substantial deviations and poor or no response, the matter is taken up with the concerned state government.
  (iv) Changes in scope of projects are identified to check whether review of earlier decision is called for or not.
- Monitoring of cleared projects is undertaken by the six regional offices functioning at Shillong, Bhubaneshwar, Chandigarh, Bangaluru, Lucknow and Bhopal.

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<th>EIA</th>
<th>SEA</th>
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<td>1.</td>
<td>EIA is usually reactive to the development proposal.</td>
<td>SEA is pro-active and informs development proposals.</td>
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<tr>
<td>2.</td>
<td>It assesses the effect of a proposed development on the environment.</td>
<td>It assesses the effect of a policy, plan or programme on the environment, or the effect of the environment on development needs and opportunities.</td>
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<tr>
<td>3.</td>
<td>It addresses a specific project.</td>
<td>It addresses areas, regions or sectors of development.</td>
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<td>4.</td>
<td>EIA assesses direct impacts and benefits.</td>
<td>SEA addresses cumulative impacts and identifies implications and issues for sustainable development.</td>
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<tr>
<td>5.</td>
<td>It focuses on the mitigation of impacts.</td>
<td>It focuses on maintaining a chosen level of environmental quality.</td>
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<td>6.</td>
<td>It has narrow perspective and a high level of details.</td>
<td>It has wide perspective and a low level of details to provide a vision and overall framework.</td>
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<td>7.</td>
<td>It focuses on project specific impacts.</td>
<td>It creates a framework against which impacts and benefits can be measured.</td>
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### 6.6 Purposes of EIA
(i) To systematically examine both beneficial and adverse consequences of the proposal.
(ii) To ensure that those consequences are taken into account during project design.
(iii) To identify possible environmental effects of the proposal and steps to mitigate them.
(iv) To predict whether there will be significant adverse effects even after the mitigation.
(v) To lessen conflicts by promoting community participation and informing decision makers.

### 6.7 Benefits of EIA
The benefits of Environment Impact Assessment are as follows:
(i) Reduced cost and time of project implementation.
(ii) Cost-saving modifications in project design.
(iii) Increased project acceptance.
(iv) Avoided impacts and violations of laws and regulations.
(v) Improved project performance.
(vi) Avoided treatment/clean up costs.

Benefits to local communities from taking part in environmental assessments include:
(i) A healthier local environment (forests, water sources, agricultural potential, recreational potential, aesthetic values, and clean living in urban areas).
(ii) Improved human health.
(iii) Maintenance of biodiversity.
(iv) Decreased resource use.
(v) Fewer conflicts over natural resource use.
(vi) Increased community skills, knowledge and pride.

6.8 Limitations of EIA

The limitation of Environmental Impact Assessment are as follows:
(i) EIA process provides advice to the decision-makers; it does not provide a final decision.
(ii) The predicted adverse effects on the environment might lead to strict conditions being imposed to avoid these effects or remedy for any adverse effects, or perhaps lead to the complete abandonment of a proposal.
(iii) EIA requires the scientific (technical) and various issues to be dealt with in a single assessment process which is bulky.
(iv) The implementation of the environmental policy focused on the EIA, and this led to overburdening process.
(v) Public consultation and public participation are limited.

Q.1 Environmental Impact Assessment (EIA) is aimed to help
(a) Estimate future needs of the society
(b) Smooth implementation of a project
(c) Cope with rapid increase in population
(d) Resource conservation

Ans. (d)
Environmental impact assessment (EIA) study is required for the new projects regarding future impacts on the environmental components. It aims to achieve sustainable development taking into care the resource conservation.

Q.2 Statement (I) : Training should be conducted among the line and low management for ensuring the importance of environmental protection plan.
Statement (II) : Environmental science is a developing subject and the people implementing environment strategies should remain up to date with the environmental control processes.
(a) Both Statement (I) and Statement (II) are individually true; and Statement (II) is the correct explanation of Statement (I)
(b) Both Statement (I) and Statement (II) are individually true; but Statement (II) is NOT the correct explanation of Statement (I)

(c) Statement (I) is true; but Statement (II) is false

(d) Statement (I) is false; but Statement (II) is true

Ans. (a)

Environmental science is new and evolving branch of science. Therefore training is required to have expertise in tackling the environmental issues especially in lower management.

Q.3 Statement (I): An EIA is a study of the probable changes in socio-economic and biophysical characteristics of the environment that may result from a proposed action.
Statement (II): The purposes of an EIA is to help design projects, which do not disturb the quality of the environment by examining alternatives.

Ans. (b)

Objective Brain Teasers

Q.1 Consider the following statements regarding Environmental Impact Assessment:
1. This is mandatory under Biological Diversity Act, 2002.
2. This acts as a tool which helps in decision making for government to access the impact of the project.
3. All industries are required to conduct a environmental impact assessment before taking approval from government.
Select the correct answer using the code given below:
(a) 1 only (b) 2 only (c) 1 and 2 only (d) 2 and 3 only

Q.2 Environmental Impact Assessment (EIA) for some developmental project is mandatory under which one of the following legislations:
(a) Indian Forest Act, 1927
(b) Air (Prevention and Control of Pollution) Act, 1981
(c) Wildlife (Protection) Act, 1972
(d) Environment (Protection) Act, 1986

Q.3 Consider the following statements:
1. EIA is a planning tool which is accepted as an integral component of sound decision-making.
2. EIA/Environment Management Plan (EMP) should assist planners and government authorities in the decision making process by identifying the key impacts/issues and formulating the mitigation measures.
Select the correct answer using the code given below:
(a) 1 only (b) 2 only (c) Both 1 and 2 (d) Neither 1 nor 2

Q.4 Which of the following is not an objective of EIA?
(a) Recycling and reduction of waste
(b) Risk analysis and disaster management
(c) Assessment of international funding
(d) Sustained development with minimal environmental degradation.

Q.5 Environmental impacts of development projects can be
(a) immediate (b) short term (c) long term (d) All of these

Q.6. The important step/steps in the predication of impacts is/are:
(a) Carrying out the evaluation of impacts
(b) Study of EIA
(c) Preparation of environmental management plan
Q.7 Consider the following statements:
1. Screening is done to see whether a project requires environmental clearance as per the statutory notifications.
2. Scoping is a process of detailing the terms of reference of EIA.
Select the correct answer using the code given below:
(a) 1 only    (b) 2 only    (c) Both 1 and 2    (d) Neither 1 nor 2

Q.8 Which is not correctly matched?
(a) ISO → International Organisation of Standards
(b) EMS → Environmental Management System
(c) EIA → Environmental Impact Assessment
(d) WTO → Whole Trade Output

Q.9 In EIA, the baseline data describes the
(a) Demographic and socioeconomic data.
(b) Assessment of risk on the basis of proposal.
(c) Environmental consequences by mapping.
(d) Existing environmental status of the identified study area.

Q.10 Risk assessment in EIA does not involve
(a) Hazard and operational studies
(b) Maximum credible analysis
(c) Assessment of economic benefit arising out of a project
(d) Preparation of disaster management plan

Q.11 Which of the following is/are objectives of the Environmental Impact Assessment (EIA):
1. Sustainable development with minimum environmental degradation.
2. Risk analysis and disaster management.
3. Recycling and reduction of waste.
Select the correct answer using the codes given below:
(a) 1 and 2    (b) 2 only    (c) 1 and 3 only    (d) All of the above

Q.12 Consider the following statements regarding Strategic Environment Assessment:
1. It takes place at earlier stages of decision making cycle.
2. It considers limited number of feasible alternatives.
Which of the above statements is/are correct?
(a) 1 only    (b) 2 only    (c) Both 1 and 2    (d) Neither 1 nor 2

Q.13 The project of which of the following are being assessed for environmental impact?
(a) Sugar industry
(b) Administration
(c) Public Investment
(d) All of the above

Q.14 Which of the following is NOT an approach to Environmental Impact Assessment (EIA)?
(a) Social impact assessment
(b) One-off impact assessment
(c) Expert judgement
(d) Matrices and interaction diagram

Q.15 Consider the following statements about monitoring:
1. It ensures the fulfillment of all the commitments made in the approved Environmental Impact Assessment.
2. It keeps track of changes that may happen in environment and communities because of the project.
Which of the above statements is/are correct?
(a) 1 only    (b) 2 only    (c) Both 1 and 2    (d) Neither 1 nor 2

Q.16 The primary reason for Environmental Impact Assessment (EIA) is to
(a) Identify the environmental consequences of development in advance.
(b) Describe proposed developments of an area.
(c) Predict the monetary value of impacts of developments.
(d) Mitigate existing environmental impacts of developments.
Q.17 Consider the following statements:
1. Strategic Environmental Assessment is undertaken much earlier in the decision-making process than Environmental Impact Assessment.
2. Matrix methods are used primarily for organizing information of Strategic Environmental Assessment only.
Which of the above statements is/are correct?
(a) 1 only (b) 2 only (c) Both 1 and 2 (d) Neither 1 nor 2

Q.18 Which of the following projects require complete EIA process?
1. Category A projects
2. Category B projects
Select the correct answer using the codes given below:
(a) 1 only (b) 2 only (c) Both 1 and 2 (d) Neither 1 nor 2

Q.19 Risk Assessment is different from Environmental Impact Assessment in terms of
(a) Hazard identification (b) Disaster Management (c) Probability expression (d) Consideration of human environment

Q.20 Which of the following process is used to determine whether a full Environmental Impact Assessment (EIA) is needed or not?
(a) Scoping (b) Baseline data (c) Screening (d) Public hearing

Q.21 Which one of the following projects is assessed for environmental impact?
(a) Public investment (b) Administration (c) IT-based services (d) Irrigation and power

Q.22 An environmental audit helps in achieving the
(a) Waste minimization (b) Public awareness (c) Resource optimisation (d) All of the above

Q.23 Arrange the following steps of Environmental Impact Assessment in the chronological order:
1. Management and monitoring
2. Screening
3. Audit
4. Prediction and mitigation
5. Scoping
Select the correct answer using the codes given below:
(a) 2-5-4-3-1 (b) 5-2-3-1-4 (c) 2-5-4-1-3 (d) 5-2-3-4-1

Q.24 Arrange the following phases of Environmental Impact Assessment process in a correct sequence:
1. Collection of baseline data.
2. Monitoring the clearance conditions.
4. Prediction of impacts based on past experience and mathematical model.
Select the correct answer using the codes given below:
(a) 1-2-3-4 (b) 2-3-1-4 (c) 3-4-1-2 (d) 1-4-3-2

Q.25 Public hearing is conducted
(a) prior to site selection (b) prior to approval of terms of reference (c) after environmental clearance (d) after preparation of Environmental Impact Assessment (EIA)

Q.26 The validity period of environmental clearance after Environmental Impact Assessment is least for
(a) Mining projects (b) River valley projects (c) Area development projects (d) Harbour projects

Q.27 Consider the following statements:
1. Environmental impact assessment is conducted on existing projects whereas the Environmental audit is applied expansion aspects of existing projects.
2. Environmental monitoring is the systematic measurement of key environmental indicators over time within a particular geographic area.
Which of the above statements is/are correct?
(a) 1 only  (b) 2 only  
(c) Both 1 and 2  (d) Neither 1 nor 2 

Q.28 Which of the steps is NOT included in the scoping process?
(a) Describe the project area and the area of the project influence.  
(b) Conduct public meetings and stakeholder consultations.  
(c) Define a set of criteria to assess the project.  
(d) Identify and describe the environmental impacts and create a contingency plan.

Q.29 Which of the following project does not require an environmental impact assessment?
(a) Dams and reservoirs  
(b) Irrigation  
(c) Development of wells in community  
(d) Port and harbor development

Q.30 With reference to environmental impact assessment (EIA), consider the following statements:
1. Baseline data provide a means of detecting actual change by monitoring once a project has been initiated.  
2. The final EIA report is referred to as an Environmental Management Plan.  
Which of the above statements is/are correct?
(a) 1 only  (b) 2 only  
(c) Both 1 and 2  (d) Neither 1 nor 2 

Q.31 The Environmental Impact Assessment Report may consist of:
1. Assessment of the Sewerage and Sewage Treatment Implications.  
3. Assessment of the Hazard to Life.  
Select the correct answer using the codes given below:
(a) 2, 3 and 4 only  (b) 1, 3 and 4 only  
(c) 1 and 4 only  (d) All of the above

Q.32 Consider the following Statements:
1. If the EIA report has to incorporate the data of all four seasons of a year, it is called Rapid EIA.  
2. If the EIA report has only one season data, then it’s called Comprehensive EIA.  
Which of the above statements is/are correct?
(a) 1 only  (b) 2 only  
(c) Both 1 and 2  (d) Neither 1 nor 2 

Q.33 Public hearing is not required for which of the following projects?
1. Widening and strengthening of highways  
2. Modernization of existing irrigation projects  
Select the correct answer using the codes given below:
(a) 1 only  (b) 2 only  
(c) Both 1 and 2  (d) Neither 1 nor 2

Q.34 Which of the following are benefits of EIA:
1. Increased project acceptance  
2. Improved project performance  
3. Reduced cost and time of project implementation  
Select the correct answer using the codes given below:
(a) 1 and 2 only  (b) 2 and 3 only  
(c) 1 and 3 only  (d) 1, 2 and 3

Q.35 With reference to difference between EIA and SEA, consider the following statements:
1. Scale of SEA is wider than EIA as there would be number of activities involved, larger extent of impacts to be assessed, and greater range of alternatives defined and also wider area of significance.  
2. Time interval is longer in SEA in between planning, approval, and implementation.  
Which of the above statements is/are correct?
(a) 1 only  
(b) 2 only  
(c) Both 1 and 2  
(d) Neither 1 nor 2
### Answers

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|1. | (b) | 2. | (d) | 3. | (c) | 4. | (c) | 5. | (d) | 6. | (d) | 7. | (c) | 8. | (d) | 9. | (d) | 10. | (c) | 11. | (d) | 12. | (a) | 13. | (a) | 14. | (b) | 15. | (c) | 16. | (a) | 17. | (a) | 18. | (c) | 19. | (c) | 20. | (c) | 21. | (d) | 22. | (d) | 23. | (c) | 24. | (d) | 25. | (d) | 26. | (c) | 27. | (b) | 28. | (d) | 29. | (c) | 30. | (a) | 31. | (d) | 32. | (d) | 33. | (c) | 34. | (d) | 35. | (c) |

### Explanations

1. **(b)**  
   EIA has been made mandatory under the Environmental (Protection) Act, 1986 for 29 categories of developmental activities involving investments of Rs. 50 crores and above.

4. **(c)**  
   Assessment of international funding is not an objective of Environmental Impact Assessment.

7. **(c)**  
   - Screening is the determination of whether an EIA is needed or not, and is a formal requirement under the EIA Regulations.
   - Scoping is the process of determining the content and extent of matters that should be covered in the environmental information to be submitted to a competent authority or other decision making body.

9. **(d)**  
   The evaluation of baseline data provides crucial information for the process of evaluating and describing how the project could affect the biophysical and socio-economic environment.

11. **(d)**  
   **The Major Objectives of EIA are:**
   
   (i) to identify and describe elements of community and environment likely to be affected by the proposed developments.
   
   (ii) to identify and quantify any potential losses or damage to flora, fauna and natural habitats.
   
   (iii) to identify any negative impacts on sites of cultural heritage and to propose measures to mitigate these impacts.
   
   (iv) to identify the negative impacts and propose the provision of infrastructure or mitigation measures so as to minimize pollution, environmental disturbance, etc.
   
   (v) to identify, assesses and specify methods, measures and standards, to be included in the detailed design, construction and operation of the proposed developments which are necessary to mitigate these environmental impacts and reducing them to acceptable levels.
   
   (vi) to investigate the extent of side effects of proposed mitigation measures that may lead to other forms of impacts.

12. **(a)**  
   Strategic Environmental Assessment (SEA) is the process by which environmental considerations are required to be fully integrated into the preparation of Plans and Programmes prior to their final adoption. The objectives of SEA are to provide for a high level of protection of the environment and to promote sustainable development.

15. **(c)**  
   - The purpose of monitoring is to compare predicted and actual impacts, particularly if the impacts are either very important or the scale of the impact cannot be very accurately predicted. The results of monitoring can be used to manage the environment, particularly to highlight problems early so that action can be taken.
   
   - The range of parameters requiring monitoring may be broad or narrow and will be dictated by the 'prediction and mitigation' stage of the EIA.

17. **(a)**  
   - The Leopold matrix or simple matrix method is the best known matrix methodology available for predicting the impact of a project on the environment.
   
   - It is a two dimensional matrix cross-referencing:
     
     (a) the activities linked to the project that are supposed to have an impact on man and the environment.
     
     (b) the existing environmental and social conditions that could possibly be affected by the project.
23. (c)

The final EIA report is referred to as an Environmental Impact Statement (EIS).

30. (a)