53 (CE 818) ENIA

2018

ENVIRONMENTAL IMPACT ASSESSMENT

Paper : CE 818

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer ***Q. No. 1*** *and* ***any three*** *from rest.*

1. Write notes on ***any five*** of the following : 5×5=25

   (a) Ecosystem and its subsystems.

   (b) Definition of Environmental Impact Assessment.

   (c) Estimation of mobile emissions from commercial and industrial activities.

   (d) Concentration of Pollutants released from an industrial development impacting the water quality.

Contd.

(e) Diversity index for predicting impacts on wild life.

(f) Ethnicity index for predicting impacts on social characteristics of Project-Affected People (PAP).

2. (a) Define 'Environment'. What are the objectives of EIA ? Why is EIA important as a tool for 'Environmental management'? What are the benefits of EIA ? 3+4+3+4=14

(b) What do you understand by 'Environmental degradation' and 'Environmental Sustainability' in the context of implantation of an engineering project ? 3+3=6

(c) What are the different types of impact indicators ? What is impact factor ? 3+2=5

3. (a) What are the different methods of predicting environmental impacts of an engineering project ? What are the specific requirements that an impact predicting method must meet ? 3+3=6

(b) Describe with the aid of indicative/ illustrator tables the matrix method of predicting impacts. What are its advantages and disadvantages ?

6+4=10

(c) A coal-fired thermal power plant burns 6·25 tonnes of coal per hour, and discharges the combustion products through a chimney having effective height of 80*m*. The coal has sulphur content of 4·8% and the wind velocity at the top of chimney is 6*m*/*sec*. Atmospheric conditions are expected to remain moderately to slightly unstable. Determine the ground level concentration of SO_2 *(i)* at a distance of 5*km* downwind at the centre line of the plume, and *(ii)* at a crosswind distance of 0·5*km* on either side of the centre line of the plume. From the established graph, the values of plume's standard deviation in metre in crosswind direction, σ_y and that in vertical direction σ_z are read as below.

For moderately unstable condition : $\sigma_y = 680\ m$ and $\sigma_z = 190\ m$.

For slightly unstable condition : $\sigma_y = 450\ m$ and $\sigma_z = 220\ m$. 9

4. *(a)* Describe the stages of Environmental Impact Assessment process (e.g. according to the Ministry of Environment, Forest and Climate change in India) stating the aspect to be considered in each stage and the usefulness of each style. 10

(b) Describe Seven key areas (e.g. according to European Union Directive) about which information must be included in an EIA report. 10

(c) What is Environment Impact Statement (EIS) and what are its parts? 5

5. *(a)* Write a note on the integration of EIA system with planning framework, decision-making and development process. 10

(b) What is the importance of public participation in an EIA System? What are the general rules to be followed in conducting public hearing or public consultation for an EIA? 5+5=10

(c) Describe the criteria for judging environmental acceptability of an engineering project. 5

6. *(a)* Describe the bio-physical and socio-economic parameters likely to be impacted during construction and operation of a highway project for upgrading the existing road connecting Kokrajhar to Gelephu in Bhutan. 6

(b) With reference to the case study of EIA for Pahari Sewerage Project in the Patna city of Bihar as discussed in your class, describe the key environmental impacts during construction and operation phases of the Sewage treatment plant (STP). How were the alternative STP technologies evaluated for assessment of impact and decision making? 7+6=13

(c) Describe the typical bio-physical and socio-economic parameters likely to be impacted during construction and operation of a hydroelectric power project. 6