PNS SCHOOL OF ENGINEERING & TECHNOLOGY

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Internal assessment Examination-2022 {3rd semester }

Questions with answer

SUBJECT-Th 4 – Estimation and cost evaluation

Branch- civil engineering

1.(a) **(a) Duties and responsibilities of the Junior Engineers when posted as supervisor at site or in section**

1. To keep detail history of all roads, culverts, bridges and building which belong to his jurisdiction alongwith Row of Road, conditions of roads, bridges, culverts & buildings.

2. To maintain a register with the work which was executed over the roads, bridges, culverts and building premises or any other structure with relevant data like, Mouza Map, Right of way for road stretches, Road furniture, trees, schematic as well as technical details of the asset, as-built drawings, nature of any work executed over the asset or its portion, date of completion of the work, end date of defect liability period (DLP) according to the contract for said work, condition of the asset during defect liability period, Name of agency with his contract reference. This register will be road wise/ building wise. He is to update asset register on regular basis keeping all relevant drawings linked with the asset in safe custody.

3. To inspect every road/bridge/culvert/building on periodical basis. He should maintain a register to keep record as per his inspection and observation. For road stretches this inspection will be biweekly basis during monsoon period. If he observes any irregularities or any damages or any difficulties at the time of his inspection he should inform it to his higher authorities at once. The recurrence of failure is to be informed to his higher authorities as and when identified.

4. To watch whether any untoward matters including encroachment are going on the roads or building premises. If he observes it, he should take suitable steps towards it and informs to his higher Authority.

5. To prepare all the preliminary & detailed estimates for original works, periodical maintenance, addition and alteration as well as modernization as directed by his higher authorities, inclusive of Scheduled & Non Scheduled items with proper analysis of rates,

rough drawing, site plan by collecting engineering data and drawings and submit those estimates to his immediate superior authority for approval from competent authority.

6. To supervise and see that all works under his charge are done according to the specifications, drawings, standards lay down in contract agreement/ tender schedule of works and approved samples by engineer in charge. He is expected to remain at site throughout in order to see that the works are executed properly in accordance with the requirements, standards and approved samples. It is the duty of the Junior Engineer to bring it at once to the notice of immediate superior authority and also make a note in the site order book if any work is not done by a Contractor maintaining stipulated period, specifications, requirement, drawings, standards laid down and approved samples (if any) including quality of materials.

1(b). Assistant Engineer Responsibilities:

- Understanding and carrying out all tasks given by the Senior Engineer.
- Collaborating with other engineers and workers to design, develop, test, and improve products and engineering processes.
- Ensuring all expenses stay within the allocated budget.
- Performing regular inspections of equipment and scheduling maintenance or repairs.
- Providing assistance to different staff or engineering teams.
- Inspecting inventory and reporting inconsistencies as well as ordering more materials.
- Producing CAD drawings according to specifications.
- Evaluating all products and processes and ensuring standardization of quality assurance measures.
- Participating in various learning experiences, which may include attending workshops and training sessions.
- Calibrating and troubleshooting equipment as required.

2.(a) types of estimate

1. Preliminary Cost Estimate

2. Plinth Area Cost Estimate
3. Cube Rate Cost Estimate
4. Approximate Quantity Method Cost Estimate
5. Detailed Cost Estimate
6. Revised Cost Estimate
7. Supplementary Cost Estimate
8. Annual Repair Cost Estimate

1. Preliminary Cost Estimate

The preliminary cost estimate is also called an **abstract cost estimate or approximate cost estimate or budget estimate.** This estimate is generally prepared in initial stages to know the approximate cost of the project. Preliminary estimates are prepared with reference to the cost of similar type projects in a practical manner. In this estimate, the approximate cost of each important item of work is displayed individually to know the necessity and utility of each item of work. The items of work include the cost of lands, cost of roads, electrification, water supply costs, cost of each building, etc.

2. Plinth Area Cost Estimate

Plinth area cost estimate is prepared on the basis of plinth area of building which is the area covered by external dimensions of building at the floor level and plinth area rate of building which is the cost of similar building with specifications in that locality.

Plinth area estimate is obtained by multiplying plinth area of building with plinth area rate. For example if we require plinth area estimate of 100 sq.m in a particular locality and plinth area rate of a building in same locality is 2000 per sq.m then plinth area estimate is 100 X 2000 = 200000.

3. Cube Rate Cost Estimate

Cube rate cost estimate of a building is obtained by multiplying plinth area with the height of building. Height of building should be considered from floor level to the top of the roof level. It is more suitable for multi storied buildings.

This method of estimation is accurate than plinth area method. The rate per cubic meter is taken into consideration based on the costs of similar type of buildings situated in that

location. Foundation, plinth and parapet above the roof level are not considered in this type of estimate.

4. Approximate Quantity Method Cost Estimate

In approximate quantity method cost estimate, the total wall length of the structure is measured and this length is multiplied by the rate per running meter which gives the cost of the building. The rate per running meter is calculated separately for the foundation and superstructure.

In case of foundation, rate per running meter is decided by considering quantities such as excavation cost, brick work cost up to plinth. While in case of superstructure quantities like brickwork for wall, wood works, floor finishing etc. are considered for deciding rate per running meter.

5. Detailed Cost Estimate

Detailed cost estimate is prepared when competent administrative authority approved the preliminary estimates. This is very accurate type of estimate. Quantities of items of work are measured and the cost of each item of work is calculated separately.

The rates of different items are provided according to the current workable rates and total estimated cost is calculated. 3 to 5 % of estimated cost is added to this for contingencies as miscellaneous expenditure.

6. Revised Cost Estimate

Revised cost estimate is a detailed estimate and it is prepared when the original sanctioned estimate value is exceeded by 5% or more.

The increase may be due to sudden increase in cost of materials, cost of transportation etc. The reason behind the revision of estimate should be mentioned on the last page of revised estimate.

7. Supplementary Cost Estimate

Supplementary cost estimate is a detailed estimate and it is prepared freshly when there is a requirement of additional works during the progress of original work. The estimate sheet should consists of cost of original estimate as well as the total cost of work including supple

8. Annual Repair Cost Estimate

The annual repair cost estimate is also called as **annual maintenance estimate** which is prepared to know the maintenance costs of the building which will keep the structure in safe condition. Whitewashing, painting, minor repairs, etc. are taken into consideration while preparing annual repair estimate for a building.