**UNIT V REPORT PREPARATION**

**TWO MARKS**

1. **Write a simple note to find depth of foundation? (April/May 2017)**

The building shall have lime concrete foundation and first class brick masonry with lime mortar up to plinth level and the superstructure shall be of first class brick work in cement mortar, 1 :6 Lintels shall be of R.B. work and roof shall be R.C.C with lime concrete terrace finishing. The drawing and dining rooms shall have mosaic floor and other rooms

**2. Define Engineer: Nov/Dec 2016**

He is the person appointed by the owner. He is technically very sound in work an his job is to see that the work is being done by contractor entirely according to drawings and specification.

**3. Define Owner:**

The person of behalf of which work is to be done. He may be an individual or firm or organization.

**4. Define Site:**

Site means the place where the work is to be executed

**5. Define Drawings:**

The section, map, plans etc… which completely define the construction work geometrically is known as drawings

**6. Define work:**

It means the work is to be carried out under this contract.

**7. What is called Tender Notice? (Nov/Dec 2015)**

The notice inviting tender is called tender notice.

**8. Define Specification:**

The drawings of a structure show the propositions and its relative position of its various parts is called specification.

1. **What are the objects of specification? (May/June 2014)**
   * Quality
   * Instruction
   * Aim of the project
2. **What are the types of specifications?**
   1. Brief Specification.
   2. General specification.

**11. Define Arbitration: (Nov/Dec 2015)**

Arbitration is the settlement of a dispute by the decision not of a court or law but of one or more persons chosen by the parties themselves involved in the dispute.

1. **Define Arbitrators:**

The persons chosen have the right to take decision are called arbitrators.

1. **What are the types of Arbitration? Nov/Dec 2012**
   1. Arbitration without intervention of court.
   2. Arbitration with intervention of court and thre is no suit pending
   3. Arbitration is suits.

**14. What do you mean by Gross income?**

It is total income that can be fetched from the property as rent or other source without deducting out goings, operational and collection charges.

**15. Define Net income:**

It is the amount left with the owner from the gross income after deducting outgoings, operational and collection expense.

**16. Define Capital cost:**

The total cost of construction of the project including land is called capital cost.

1. **What is meant y Budget?**

Budget means an annual financial statement of the anticipated receipts and expenditures. Budget estimate or statement of annual receipts ad expenditures in the form of demand prepared under different prescribed heads of accounts and submitted to the Legislature before the beginning of the financial year, where it is votedor granted

1. **What is meant by Acquittance Roll?**

The payment of salary to persons of regular establishment working outstation is drawn on the regular pay-bill, but the payment is made on a separate receipt form known as Acuqittance Roll

1. **What are all the sections resent in division office**.

Divisional Office.- Divisional office mainly consists of three sections:-

* 1. Accounts sections,
  2. Correspondence section and
  3. Computer or Drawing section

1. **Write Briefly about Group index Method for Designing Road pavement.**

Group Index of soil is a number which indicates the characteristics of soil, Group index is determined by sieve Analysis and Auerberg Limit Tests. After determining the Group Index, the thickness of the pavement is found from charts showing the relationship between the Group Index and the thickness of pavement for various traffic conditions

1. **What is meant by regular Establishment?**

Both permanent and temporary employees of the department are included in the regular establishment. Their salaries and allowances are drawn monthly on regular pay bills from the treasury in prescribed form

**SIXTEEN MARKS**

**1. Briefly explain the report preparation for estimation of culvert**. **(April/May 2017)**

**Report on Estimate for Construction of a Culvert:**

The estimate has been prepared for the construction of an arch culvert of 3m span in 15 km-300 m on Lucknow –Daulatpur road. The road at this point is flooded almost every year during the rainy reason, causing flood and damages in the area. During the last inspection the Executive Engineer has asked to prepare an estimate and this estimate has been prepared in compliance of E.E’s letter no ………….dated …………….. the cost of construction will be met from 50 civil work special repairs.

The culvert has been designed for I.R.A Class a loading. The catchment area has been determined from the 2.5 cm (1‛) map of the area, which comes to 1200 acres, and the water

way has been calculated by the Talbot formula a –cA 3 4 , where a = waterway in sq. ft , a=



Catchment area in acres, and c= constant and has been taken as 0.2. All calculation and design have been enclosed with the estimate.

The soil has been tested and has been found to be good, and ordinary spread foundation will be sufficient. The foundation shall be of cement concrete 1:4:8 and abutments, wing walls and parapets shall be of brick masonary in 1:5 cement mortar, the arch work shall be of brick masonry in 1:3 cement mortar. Exposed surfaces shall be cement pointed 1:2. all works shall be as per detailed P.W.D Specifications.

The estimate has been prepared at P.W.D Schedule of Rates. A statement of materials, cement, bricks, coal, etc., required for the construction , has been enclosed with he estimate. The work shall be executed on contract by inviting tenders and the work shall be started after the rainy season and shall be completed within four month’s time.

The estimate amounting to Rs. 15,000.00 is submitted for sanction and allotment of

Fund.

**2. Briefly explain the report preparation for estimation of Road (April/May 2017)**

**Report on the Estimate for a Road Construction.**

The estimate for the construction of Hindnagar – kaliganj road of 25 km – 500 in length has been prepared for linking Kalignaj with the District Headquarters in compliance with S.E.’s letter no………….dated………………

Kalignaj is an important market place for agricultural products and there are some cottage industries in the area, and there having no road the area is not being developed. The proposed road will also serve many villages on either side. The people of the locality have also represented and demanded separately for the construction of this road. It is therefore essential to construct this road. The proposal has been included in the Fourth Five year Plan and the cost will be met from the Road Development Fund.

Alignment of the road follows an existing card road with straightening when necessary and avoiding conjested areas as far as possible. Flat curves have been provided with a minimum radius of 150 m. In selecting the alignment principles of shortest route, serving maximum population, minimum drainage crossing easy gradient economy of construction, etc.., have been followed. The road passes mostly through uncultivated area in plane land, and mostly in banking of 60 cm to 90 cm high excepting a few places where the road passes in low where high banking will be required.

Planet table survey has been made for the whole length of the road for 60 m width on each side of the centre line and L-section has been prepared by taking levels at every 30 m and cross levels have been taken at every 90 metre. Formation line has been fixed to have easy gradient and ruling gradient of 1 in 40 has not reached anywhere. Highest flood level has been kept in view and formation line has been kept above normal flood level.

A number of culverts will be required along the length of the road and ridge of about 30 m span will be required across the stream in km 12. A list of bridges and culverts of different span has been enclosed and provisions have been made on the basis of running metre of span at the rate of Rs. 5,000.00 per r m of span for culverts and Rs. 6,000.00 per r m of span for bridges.

Bridges shall have to be designed on I.R.C class A Loading and their detailed estimate shall have to be prepared separately.

A present land of 30 m width shall be required and has been provided in the estimate. Temporary land for borrowpits shall be required for one year for taking earth for embankment and provision has been made accordingly. The formation width of the road shall be 10 m and side slope 2:1 in banking and 12 : 1 in cutting.



The road shall be metalled with soling coat of brick on edge with over burnt bricks and two coats of metalling, inter coat and top coat, each of 8 cm compacted layer with stone ballast. The two wearing coats shall be of one coat of bituminous painting. Provisions for metalling and painting have been made in the estimate accordingly.

Brick shall be burnt by contract by the side of road distributed along the road in three brick kilns. Coal shall have to be supplied to contractors for burning bricks and a statement of coal requirement is enclosed. Stone metal shall be hard granite type and shall be collected from the approved quarry.

The whole work of construction shall be spread in five years, earth work one year, rest for settlement one year, metalling two years and painting one year.

Second coat bituminous painting shall be done after one year of 1st cost of painting and cost of painting shall be met from maintenance grant.

All works shall be done strictly as per detailed P.W.D Specifications. The estimate has been prepared at P.W.D Schedule of rates and local current rates and analysis of rates have been given for non-schedule items. The work shall be done by contract by inviting tenders.

Survey Plan, L-sections and Cross-sections of the proposed road are enclosed with the estimate. An index plan showing the alignment has also been enclosed.

The estimate amounting to Rs. 25,00,000.00 has been submitted for sanction and allotment of fund.

**3. Describe the principles for the report preparation of water supply scheme (April/May 2017)**

**Principle for the preparation of Water supply Scheme:**

1. **Selection of source:-** Where raw water from flowing streams, lakes , tanks ad other impoundment from contaminated catchments and ponds form the source, provision should be made in the scheme for filtering such water prior to disinfection.
2. **Quality of water**.- The chemical quality of supplies proposed from ground water through tube wells, wells and infiltration works should be of acceptable quality, to be adjudged wit reference to local condition, where special treatment of removal of dissolved substance like iron, sulphates and flurides is necessary, provision should be made there in the scheme.
3. **Disinfections.** – It is advisable to provide for continuous effective disinfections of supplies drawn through tube wells, wells and infiltration works where local conditions indicate the need.

Where surface water is the source, treatment including filtration and disinfection of the final effluent is essential.

It is equally important to ensure that the free residual chlorine of a minimum of 0.2 ppm is maintained at all points in the distribution system.

1. **Simple drip-feed device**.- For simple rural well supplies, disinfection should be arranged by a simple and economical drip feed of a decanted bleaching powder solution, the dosage being adjusted to suit the rate of draw from the source. A simple gravity feed arrangement for such a purpose should be followed.
2. **Pressure-feed chlorinators**. – There are different types of pressure-feed chlorinators available for injecting chlorine solution into force mains. The two good classification of these chlorinates are –
3. the positive-feed type, and
4. the vaccum type

The details of their working and operation, and the care of chlorinator equipment are set out in paras 10-6-22 and 10-6-3 on pages 132-136 of the Manual of Water supply issued by the Ministry of Health.

**Structure of infiltration galleries** - In developing safe supplies through infiltration works the essential details to be followed in the design of infiltration galleries have been set out in the Water supply Manual .

1. **Slow sand filter**.- Where slow sand filtration is adopted for treatment of raw water, the design criteria to the adopted are as set out in the Water Supply Manual. A typical design calculation to determine the economical size of filters is given in the following page.
2. **Type design of iron removal plant**. – A typical design of an iron –removal plant should b followed. The basic factors governing the design of such plants are set out in the Water Supply Manual. These may be adopted with suitable notification where removal of iron from ground or surface water is necessary.
3. **Mechanical fitter plants**. – Where full-scale treatment of raw water comprising chemical design mixing, flocculation, sedimentation and filtration followed by disinfection is necessary, the functional aspect of each component as well as the design criteria recommended in respect of each, as set out in the Water Supply Manual may be adopted with suitable modification.
4. **Economical size for source mains**. – the per capita rate of supply to be adopted in respect of each community, the most economical means of conveyance of the supply from the source to the service points and the design of the distribution system in each case may generally follow the guide – lines set out in the Water Supply Manual.
5. **Charts for pipe flow computation**. – It is recommended that Hazen and William’s Formula should be adopted in the design of pressure mains while the Cutter’s Formula orthe

Manning’s Formula should be used for free-flow conduits. Readymade charts for computing pipe size under the Hazen and William and Kutter’s Formulae may be used.

The Hazen and Williams’s Chart is based on a value of 100 for ‘c’. For other values of ‘c’ applicable to different pipe materials (as recommended in the Water Supply Manual) the corresponding figures will have to be deducted.

The Kutter’s Charts are for a value of ‘n’ =.015 which may be adopted for all pipes upto 24 ‚ dia. and masonry conduits of all sizes. A value of ‘n’ = .013 may be used for pipes above 24‛ dia.

**4. Explain report on estimate for the construction of residential building. (Nov/Dec 2015, Nov/Dec 2016, Nov/Dec 2013, Nov/Dec 2012)**

**Report On Estimates for the Construction of Residential Building.**

The detailed estimate for construction of a residential building for the Executive

Engineer at Udaynagar has been prepared in compliance of S.E.’s letter no……………. dated…………………..

There is no building for the residence of the Executive Engineer at Udaynagar and he has to live in a rented building with meager accommodation at a very high rent. It has, therefore, been proposed to construct a residential building for the Executive Engineer. The head of the accounts will be 50 civil original works, building.

The estimate provides for the following accommodation:-

One drawing room, one dining room, three bed rooms, one guest room, and the necessary store kitchen, baths, front and back verandahs and motor garage per plan enclosed.

A site has already been selected having a land of 60 m  30 m (200  100’) for the construction of the building having good soil and proper drainage and this much of land has to be acquired. The building shall be oriented to face north direction.

The building shall have lime concrete foundation and first class brick masonry with lime mortar up to plinth level and the superstructure shall be of first class brick work in cement mortar, 1 :6 Lintels shall be of R.B. work and roof shall be R.C.C with lime concrete terrace finishing. The drawing and dining rooms shall have mosaic floor and other rooms

2.5 cm(1‛) c.c. floor over 7.5 cm (3‛) lime concrete. Inside and outside walls shall be 12 mm (1/2 ‚) cement line plastered 1:1:6, and ceiling shall be 6 mm (1/2‛) cement plastered 1:3.

Inside of drawing and dining rooms shall be colour washed and inside of remaining rooms shallbe white washed and outside wall be colour washed. Doors and windows shall be 4.5

cm 13 4 "thick teak wood with chaukhat o sal wood and enamel painted. All work shall be



strictly as per detailed P.W.D. Specification.

The estimate has been prepared at P.W.D Schedule of rates, and for non-schedule items on analysis of rates. The foundation has been designed for a safe load of 9 tonne per sq m (8 ton per sq ft) and the R.C.C roof has been designed for a safe load of 150 kg per sq m (30 1bs per sq ft) with 1400 kg per sqcm (20000 1bs per sq in) as sage tensile stress of steel and 50 kg sq cm (750 1bs per sq in) as safe compressive stress of concrete. All designs and calculations have been included in the estimate. Plans and drawings and site plans are also enclosed with the estimate.

Provision has been made for electrification and sanitary and water supply works and 20% of the estimated cost of the building works ahs been included for these works. As there is no sewer line in the area a septic tank shall have to be constructed for which lump sum provision of Rs.700,00 has been made in the estimate.

Provision for compound with a gate in the front and barbed wire fencing on the sides and back, and approach road have also been made in the estimate.

A statement of important materials as cement, steel, coal, etc., which shall have to be arranged by the department is also enclosed with the estimate. A rent statement is also enclosed.

The work shall be carried on contract by inviting tenders. The work shall be completed within six months from the date of start.

The estimate work out as Rs. 5,000,00 and is submitted for sanction and allotment of

fund.

**5. Explain report on estimate fix construction of a culvert**. **(May/June 2014,May/June 2013, Nov/Dec 2012)**

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**7. What are all the principle for the preparation of water supply scheme? (Nov/Dec 2015, Nov/Dec 2013, Nov/Dec 2012)**

**Principle for the preparation of Water supply Scheme:**

1. **Selection of source:-** Where raw water from flowing streams, lakes , tanks ad other impoundment from contaminated catchments and ponds form the source, provision should be made in the scheme for filtering such water prior to disinfection.
2. **Quality of water**.- The chemical quality of supplies proposed from ground water through tube wells, wells and infiltration works should be of acceptable quality, to be adjudged wit reference to local condition, where special treatment of removal of dissolved substance like iron, sulphates and flurides is necessary, provision should be made there in the scheme.
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**8. What are the features consist in a project or scheme of work? (May/June 2014)**

**The project or scheme of major work consist of the following works:-**

* Preliminary investigation, Reconnaissance, Preliminary survey, trial boring, soil testing etc.
* Preparation of preliminary estimate and obtaining administrative approval
* Selection of site or alignment
* Surveying –Plane table survey, leveling, contouring, etc.,
* Preparation of survey plan, plotting of levels and contours, preparation of longitudinal section, cross section etc., as may be required,
* Working out the requirements – number, type and size of buildings of different categories. Water-way for bridges and culverts, capacity of channels (canals distributories, minor, etc). width and type of road etc, as the case may be,
* Marking formation line of road or formation line of bed of channels in the L-section drawing cross sections of road channels, etc. as the case may be ,
* Designing – structural design and calculations, basis of deign, etc.,
* Planning, preparation of drawings- Plan , elevation, sections, detailed drawings, etc.,
* Preparation of Layout plan, Site plan or Index plan. In case of irrigation project and Road project the alignment is marked on the Shajra maps showing the different plots of land to be acquired. For irrigation project , the area served by different outlets and channels are marked on the Shajra map
* Preparation of general specification of the different building of works, and preparation of Detailed specifications of each item of works.
* Working out the Analysis of rates of different items of work. Usually, the rates are taken as per printed Schedule of Rates and Analysis of rates are prepared only for non-scheduled items,
* Preparation of Detailed estimate and abstract of cost of each building or each work
* preparation of general abstract of cost for the whole project. 10 per cent of the whole estimate cost is provided for departmental charges.
* Preparation of rent statement or return (revenue income) and comparing the total amount of capital cost with the return,
* Working out the requirement of important materials and preparing a statement of important materials as cement, steel brick, coals, etc. which are to be arranged by the department,
* Phasing of the project – Big projects are constructed in phases – 1st phase, 2nd phase, 3rd phase etc.,
* Estimate for temporary accommodation for office, store sheds, staff quarters, accommodation for workmen (labour huts) arrangements for temporary water supply and sanitary works and public health work, approach roads, etc. should also be prepared under separate head. Temporary accommodation and Prelimarny works,
* The main estimate should also include the cost of land, Development of land – Levelling and dressing, Cost of roads, Cost of water supply works, Cost of sewer and sewer works, cost of surface drains ad storm water drains. Cost of Electrification external services, Cost of Arboriculture, Cost of Preliminary investigation and surveying etc. Estimate for those works may be prepared in detail if possible, but as all the details of the work are not known at the time of preparing the estimate they are estimated on area basis of the whole project area at the rate of per unit (Rupees per hectare of Rupees per acre) or comprehensive to give a clear idea and picture of the whole project.
* Technical Report of project – Report should be concise but comprehensive to give a clear idea and picture of the whole project. The report should given the brief history of the work, reference to administrative approval necessity justifying the most suitability of the project, availability of materials and labour, agency for the work costof each phase of work, time required for the completion of each phase of work and also of the whole work, the total cost of the whole project.

**9. Explain the various methods of valuation (May/June 2014, Nov/Dec 2015, Nov/Dec 2016)**

Depreciation method of valuation

Valuation based on cost

Valuation based on profit

Valuation by Development method

Rental method of valuation

**a) Depreciation method of valuation**

In this method, the structure is divided into four parts for calculating depreciation:

Walls

Roofs

Floors

Doors and Windows

The measurement is done accurately and the cost is found out using current rates. Life of each portion is found out using Table A. to find out depreciated value, the formula used is



where all the values are given, „D‟ can be calculated.

This value does not in clued cost of land, water supply, sanitary fitting, electric installations etc.

The cost of above items are added to get the total valuation of property. The table C gives calculate values of depreciation for different values of

„n‟ and „rd‟.

**b) Valuation based on cost**

In this method, the actual cost of the construction is found out and valuation is done after considering depreciations and also caring for type of construction and design of the construction.

**c) Valuation based on profit**

Under this sub-head, valuation of cinemas, theatres, hotels, banks, big shop etc. Located at sui9table places is done where profit is of capitalized value. The capitalized value is calculated by multiplying year‟s purchase with net profit. The net profit is worked out after deducting all possible outgoings and expenditures from the gross income. In such cases the cost will be too high as compared with the cost of construction actually incurred.

**d) Valuation by development method**

This method is also used for working out the value of a building. In certain cases, some additions, alterations and improvements are carried out which increases the cost of the building. The valuator should be careful while doing evaluation about this.

In cases, when the building is still under development. In this case the future development of the building and profits from it should be anticipated while evaluating.

**e) Rental method of valuation**

Rent of a building is used as a base for calculating value of a building. In this method the net income by the war of way of rent is found out after deducting all out goings from the gross income. A suitable rate of interest prevailing in the market is also to be assumed of such type of buildings. Based on the above rate of interest, the Y‟ P. is obtained. The net income is multiplied with Y‟s P. to obtain capitalized value

1. **Prepare an approximate estimate of building project with total plinth area of all building is 800 sqm. and from following data.**
2. **Plinth area rate Rs. 4500 per sqm**
3. **Cost of water supply @7½ %of cost of building.**
4. **Cost of Sanitary and Electrical installations each @ 7½% of cost of building.**
5. **Cost of architectural features @1% of building cost.**
6. **Cost of roads and lawns @5% of building cost.**
7. **Cost of P.S. and contingencies @4% of building**

**cost. Determine the total cost of building project.**

Solution:

Data given:

Plinth area = 800m2

Plinth area rate = Rs. 4500 per Sq.m

Cost of building = 800 x 4500 = Rs. 36,00,000=00

Add the cost of the water supply charges @ 71/2 %



Add the cost of sanitary and electrical installation @15%



Add the cost of architectural feature @ 1%



Add the cost of Roads Laws @5%



add the cost of P.S and contingencies @4%



Total Rs. 47, 70, 000 = 00

Assume add supervision charges 8% on over all cost



Grand total Rs. = 51,51,600 = 00

Total cost Rs. = 7,19,750, 00